

# *Compaq StorageWorks* <sup>TM</sup>

## **ESL9326 Tape Library**

Diagnostic Software Guide

Third Edition (September 2000)  
Part Number 146586-003  
Compaq Computer Corporation

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# About This Guide

This guide is designed to be used as step-by-step instructions for installing, using, and updating the diagnostic software for the Compaq StorageWorks ESL9326 Tape Library.

## Text Conventions

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

<b>Keys</b>	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.
<i>FILENAMES</i>	File names appear in uppercase italics.
Menu Options, Command Names, Dialog Box Names	These elements appear in initial capital letters.
COMMANDS, DIRECTORY NAMES, and DRIVE NAMES	These elements appear in uppercase unless case sensitive.
Type	When you are instructed to <i>type</i> information, type the information <b>without</b> pressing the <b>Enter</b> key.
Enter	When you are instructed to <i>enter</i> information, type the information and then press the <b>Enter</b> key.



## Symbols in Text

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



**WARNING:** Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

---



**CAUTION:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

---

**IMPORTANT:** Text set off in this manner presents clarifying information or specific instructions.

---

**NOTE:** Text set off in this manner 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 reduce the risk of injury from electrical shock hazards, do not open this enclosure.

---



Any RJ-45 receptacle marked with these symbols indicates a Network Interface Connection.

**WARNING:** To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

---



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 reduce the risk of injury from a hot component, allow the surface to cool before touching.

---



Power Supplies or Systems marked with these symbols indicate the equipment is supplied by multiple sources of power.

**WARNING:** To reduce the risk of injury from electrical shock, remove all power cords to completely disconnect power from the system.

---



Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

**WARNING:** To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

---

## Cabinet Stability



**WARNING:** To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
  - The full weight of the cabinet rests on the leveling jacks.
  - The stabilizing feet are attached to the cabinet if it is a single cabinet installation.
  - The cabinets are coupled in multiple cabinet installations.
  - Only one component is extended at a time. A cabinet may become unstable if more than one component is extended for any reason.
-

## 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 Technical Support

In North America, call the Compaq Technical Phone Support Center at 1-800-OKCOMPAQ. For continuous quality improvement, calls may be monitored or recorded. This service is available 24 hours a day, 7 days a week.

Outside North America, call the nearest Compaq Technical Support Phone Center. Telephone numbers for worldwide Technical Support Centers are listed on the Compaq website. Visit the Compaq website at [www.compaq.com](http://www.compaq.com).

Be sure to have the following information available before you call Compaq:

- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

### Compaq Website

The Compaq website has information on this product as well as the latest drivers and Flash ROM images. Visit the Compaq website at [www.compaq.com](http://www.compaq.com).

## **Compaq Authorized Reseller**

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.
- Elsewhere, visit the Compaq website at [www.compaq.com](http://www.compaq.com).

# Chapter 1

## Overview

The Compaq *StorageWorks ESL9326 Tape Library™* diagnostic software runs on a Personal Computer (PC) and provides the ability to test individual components and overall operation of the tape library. Topics discussed in this guide are:

- Installing the diagnostic software on a PC
- Connecting the tape library to a diagnostic PC
- Starting the diagnostic software
- Menu overview and window descriptions
- Using the diagnostic software
- Exiting the diagnostic software

## Chapter 2

# Installing Diagnostic Software

This chapter explains how to install the diagnostic software on your Personal Computer (PC).

## Installing Diagnostic Software

To install the diagnostic software:

1. Insert the diagnostic diskette into diskette drive A.
2. At the C:\> prompt, type: A:\INSTALL
3. Press the **Enter** key.

This starts the installation process.

**NOTE:** The install program creates a directory called TAPELIB on the C drive and copies the files listed in Table 2-1 into the new directory.

**Table 2-1**  
**TAPELIB Directory**

File	Description
<i>README.DOC</i>	Contains the latest product information and installation instructions
<i>LIB.DAT</i>	Batch file that invokes the TAPELIB diagnostic program
<i>TAPELIB.EXE</i>	Executable file
<i>TAPELIB.HLP</i>	Online help file
<i>TAPELIB.MSG</i>	Online error message data file
<i>TAPELIB.NDX</i>	Online error message index file
<i>INSTALL.BAT</i>	Installation batch file
<i>PP6.TST</i>	Predefined test script

## Working with Native MS-DOS

To work in Native MS-DOS, you must restart the computer from a bootable diskette.

1. Create a bootable MS-DOS diskette.
  - a. Using a PC, go to the MS-DOS prompt (or shell).
  - b. Insert a blank diskette into drive A.
  - c. Type `Format A:/S` and press the **Enter** key.
  - d. When asked for a label name, press the **Enter** key.
  - e. After the formatting completes, remove the diskette.
2. Boot from Native MS-DOS as follows:
  - a. Shut down the computer.
  - b. Insert the bootable MS-DOS diskette.
  - c. Restart the computer. It will start in Native MS-DOS.

3. From Native MS-DOS change to the hard drive and the directory TAPELIB, wherever it is located.

a. Set the computer's serial port to COM1.

b. Specify a baud rate of 9600 in the command TAPELIB/B9600.

**NOTE:** The tape library diagnostic program must operate from native MS-DOS when using the Flash Download function. For all other functions use either native MS-DOS or run from a MS-DOS window.



# Chapter 3

## Connecting the Tape Library to a Diagnostic PC

This chapter explains how to connect the StorageWorks ESL9326 Tape Library to a diagnostic PC.

### Connecting to the Diagnostic PC

Use the following procedure to connect the tape library to a diagnostic PC (see Figure 3-1 and Table 3-1):

1. Open the rear center access door on the tape library.
2. Route the RS-232 diagnostic cable through the cable access hole in the bottom of the cabinet and connect it to the 9-pin diagnostic port (J2) on the robotics controller Printed Wiring Assembly (PWA). Note that connector J2 is exposed on the left side of the electronics bay ❶.
3. Connect the other end of the RS-232 cable to the COM port on the diagnostic PC.

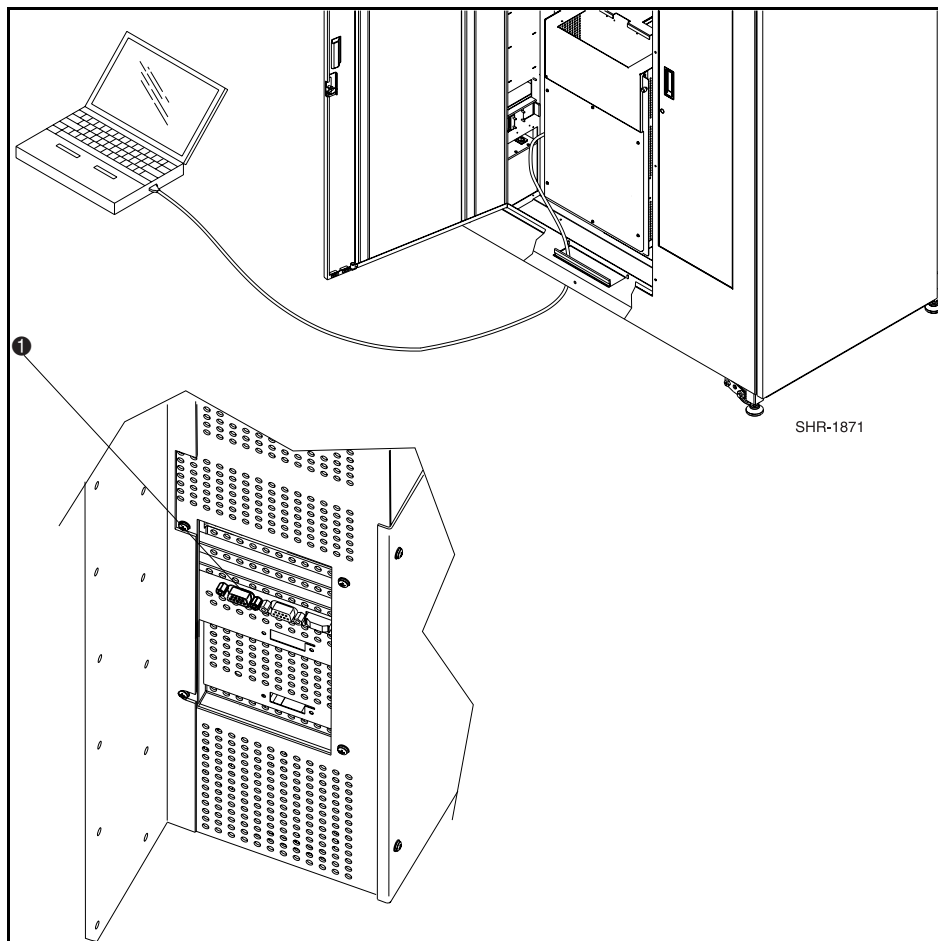


Figure 3-1. Connecting the diagnostic cable

**Table 3-1**  
**Diagnostic Cable Connection**

Figure Legend	Description
①	Diagnostic port (left side of tape library)

# Chapter 4

## Starting the Diagnostic Software

This chapter explains how to start the diagnostic software. Topics in this chapter include:

- Starting the diagnostic software
- Modifying the *LIB.BAT* file
- Using online help
- Online error messages

### Starting Diagnostic Software

1. Turn on the tape library.
2. Press the **Standby** button on the control panel to switch the tape library to off-line.
3. Set the diagnostic PC in native MS-DOS mode.

4. At the DOS prompt type: TAPELIB/b9600/M/D/CX and then press the **Enter** key.

Where:

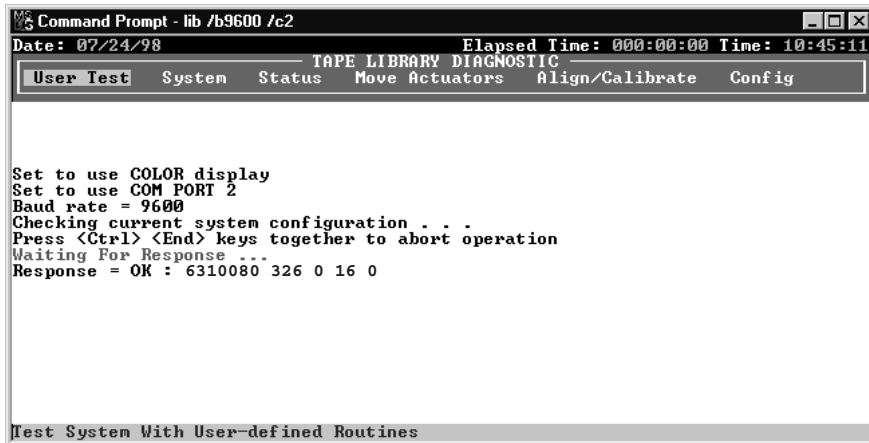
/B = Serial port baud rate. This must be set at 9600 baud rate when interfacing with the tape library. The default is 2400 baud rate.

/M = Indicates a monochrome display. If this variable is omitted, the software assumes a color monitor is being used.

/D = Enables the software to capture messages to/from the diagnostic COM port. Messages are logged in the file *CAPTURE.TXT* in the diagnostic software home directory.

/CX = If specified, uses the COM port (1 or 2) for communication to the host. Supported ports are COM 1 and COM 2. The default is COM1.

5. After several seconds, verify that the main menu appears (see Figure 4-1).



```
MS-DOS Command Prompt - lib /b9600 /c2
Date: 07/24/98                               Elapsed Time: 000:00:00 Time: 10:45:11
----- TAPE LIBRARY DIAGNOSTIC -----
User Test  System  Status  Move Actuators  Align/Calibrate  Config

Set to use COLOR display
Set to use COM PORT 2
Baud rate = 9600
Checking current system configuration . . .
Press <Ctrl> <End> keys together to abort operation
Waiting For Response . . .
Response = OK : 6310080 326 0 16 0

Test System With User-defined Routines
```

Figure 4-1. Main menu

Table 4-1 lists examples of TAPELIB initialization commands.

Command	Monitor Type	Port Used
TAPELIB /b9600	Color	COM 1
TAPELIB /b9600 /M	Monochrome	COM 1
TAPELIB /b9600 /C2	Color	COM 2

## Modifying the *LIB.BAT* File

If you plan to use *TAPELIB.EXE* with the same configuration options every time, you can modify the *LIB.BAT* file using a text editor. The default *LIB.BAT* file includes the following commands:

```
@ ECHO OFF
C:
CD\TAPELIB
TAPELIB %1%2%3
ECHO ON
```

The variables %1, %2, %3 are configuration options. These variables are described earlier in this chapter. You can modify these options to reflect your specific configuration.

For example, if you plan to use the diagnostic software to control the tape library from a monochrome laptop PC through COM port 2, modify the batch file as shown below:

```
@ ECHO OFF
C:
CD\TAPELIB
TAPELIB /b9600 /M /C2
ECHO ON
```

When you have finished editing the *LIB.BAT* file, save the file under a new file name, for example, *ESL9000.BAT*.

To execute the modified file, type the following at the C: prompt:

```
ESL9000
```

## Using Online Help

The online help file, *TAPELIB.HLP*, can be viewed at any time when running the software by pressing the **F1** function key. The help file explains how to use the software and describes special features. (Press the **Enter+Shift+F1** keys for a more detailed description of the function in question.)

**NOTE:** You can modify this file to include additional information by using a text editor. However, no line can be longer than 70 characters (a tab is equivalent to four character spaces) and the total file size must be under 5 KB.

## Online Error Messages

The diagnostic software automatically displays an error code description each time an error is received from the component being diagnosed. These error descriptions are contained in the error message data file called *TAPELIB.MSG*. An index file, *TAPELIB.NDX*, is included to provide pointers to each error code description.

# Chapter 5

## Menu Overview and Window Descriptions

This chapter describes the structure of the diagnostic software and includes:

- A description of each window in the menu structure
- A description of the function and control keys used in the diagnostic software
- A description of the numbering convention used to designate the location of the storage bins, the load port bins, and the tape drives

### Menu Structure

The diagnostic program is divided into three parts:

- Main menu screen
- Return Status window
- Command Status window

Each window is opened differently; however, pressing the **Esc** key may close all windows.

---

**IMPORTANT:** Before you can exit some windows, you must stop some tests by pressing the **Ctrl+End** or **End** keys.

---

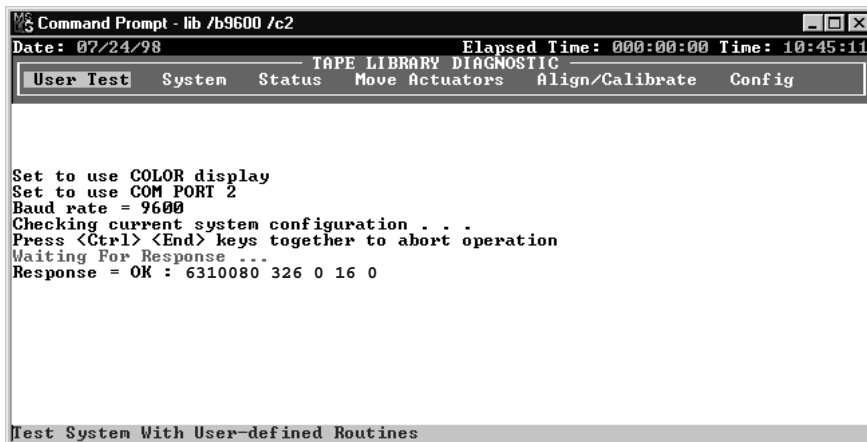
**NOTE:** The diagnostic software is designed to test other tape libraries as well as the ESL9326. When the diagnostic PC is connected to an ESL9326 and started, only those diagnostic menu options that are applicable to the ESL9326 are displayed. If more than one tape library model is tested using the diagnostic software, then you must completely exit the program and restart the program after the diagnostic PC has been connected to the new tape library.

**NOTE:** Some options that appear on the menus might not be supported by the ESL9326. These are noted in the text.

## Main Menu

After the startup procedures described in Chapter 4, the Main menu appears (see Figure 5-1).

**NOTE:** In Simulation Mode, an additional screen appears prompting you to identify the type of tape library. Once you have provided this information, the Main menu appears.



```
Command Prompt - lib /b9600 /c2
Date: 07/24/98 Elapsed Time: 000:00:00 Time: 10:45:11
TAPE LIBRARY DIAGNOSTIC
User Test System Status Move Actuators Align/Calibrate Config

Set to use COLOR display
Set to use COM PORT 2
Baud rate = 9600
Checking current system configuration . . .
Press <Ctrl> <End> keys together to abort operation
Waiting For Response . . .
Response = OK : 6310080 326 0 16 0

Test System With User-defined Routines
```

Figure 5-1. Main menu



The top of the screen displays several task icons for modifying the program window or selecting, cutting, and pasting text. To identify the task, place your cursor over the icon.

The information line near the top of the screen displays the:

- Current Date (mm/dd/yy)
- Elapsed Time (hhh:mm:ss) of a specific test
- Time (hh:mm:ss)

Below the information line, the Tape Library Diagnostic Main menu bar appears showing the six categories of diagnostic functions:

- User Test
- System
- Status
- Move actuators
- Align/calibrate
- Config

There is a status line at the bottom of the screen that provides a brief description of the menu, sub-menu, or command that is highlighted.

## Drop-Down Menus

Each of the diagnostic categories, and many of the sub-functions, are accessed through drop-down menus. You can select any diagnostic category on the Main menu bar by using the **Left/Right** arrow keys. When selected, the category title is highlighted. To access the highlighted function, press the **Enter** key and the drop-down menu appears listing the available options (see Figure 5-2).

You can use the **Up/Down** arrow keys to navigate through the drop-down menu or you can highlight the desired option by using the keyboard to enter the letter that is located to the right of the option. Once you highlight the desired option, press the **Enter** key to execute it or access its sub-menu.

**NOTE:** In some cases, the letter to the right of each option may be duplicated. Entering the letter two or three times, as needed, may access the second or third occurrence of the letter.

Press the **Esc** key to exit any diagnostic menu.

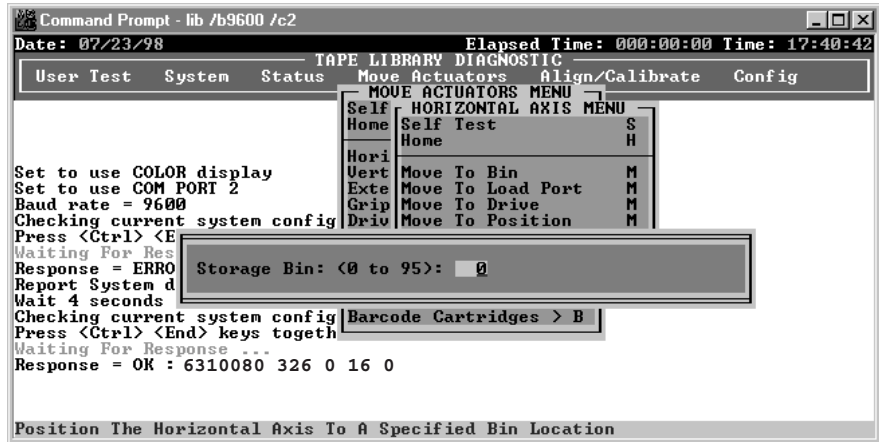


Figure 5-2. Sample drop-down menu

## Sub-Menus and Pop-Up Windows

A “>” (greater than symbol) preceding the letter to the right of an option (see Figure 5-2) indicates that a sub-menu or a pop-up window is available. Sub-menus provide further options, and pop-up windows typically request additional information that is necessary for executing a particular function.

If a sub-menu appears (see Figure 5-2), select the appropriate option using the **Up/Down** arrow keys or the keyboard. Then press the **Enter** key to execute the function.

If a pop-up window appears, enter the requested information, and then press the **Enter** key to execute the option.

Press the **Esc** key to exit any sub-menu or pop-up window.

## Return Status Window

The Return Status window (see Figure 5-3) displays detailed information concerning a function that you have selected.

Press the **Esc** key to exit any Return Status window.

```

MS-DOS Command Prompt - lib /b9600 /c2
Date: 07/23/98 Elapsed Time: 000:00:08 Time: 17:43:33
----- TAPE LIBRARY DIAGNOSTIC -----
User Test System Status Move Actuators Align/Calibrate Config
RETURN STATUS

Response For REPORT ACTUATOR ->
RETURN STATUS: GOOD
Horizontal Position: 4.416800
Vertical Position: 3.615000
Extension Position: 2.998500
Gripper Status: CLOSED

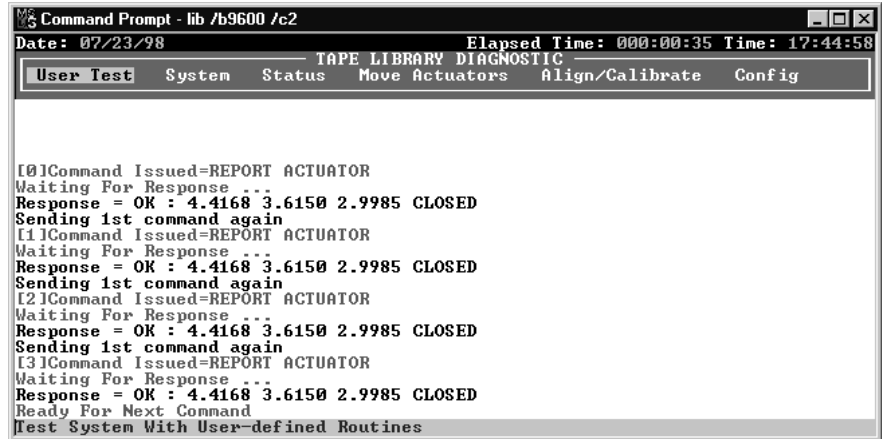
Respo
Repor
Wait
Check
Press TEST Mode, Press <END> key to exit .....
Waiti Pausing for 4 seconds
Respo Response For REPORT ACTUATOR ->
Horizontal Position: 4.416800
Vertical Position: 3.615000
Extension Position: 2.998500
Gripper Status: CLOSED
Sendi Pausing for 4 seconds
Waiti
Waiti
Response = OK : 4.4168 3.6150 2.9985 CLOSED
Display Actuator Positions Continuously
  
```

Figure 5-3. Return Status window

## Command Status Window

The Command Status window (see Figure 5-4) displays the communications between the diagnostic software and the tape library. For each command sequence, it lists the command names and the number of commands executed, as well as the elapsed time.

This window is often partially hidden by drop-down menus or pop-up windows. To view the full window, press the **Home** key. Then, you can use the **PageUp**, **PageDown** or the **Up/Down** arrow keys to view the portions of the window that have already scrolled off the screen.



```
Command Prompt - lib /b9600 /c2
Date: 07/23/98 Elapsed Time: 00:00:35 Time: 17:44:58
TAPE LIBRARY DIAGNOSTIC
User Test System Status Move Actuators Align/Calibrate Config

[I0]Command Issued=REPORT ACTUATOR
Waiting For Response ...
Response = OK : 4.4168 3.6150 2.9985 CLOSED
Sending 1st command again
[I1]Command Issued=REPORT ACTUATOR
Waiting For Response ...
Response = OK : 4.4168 3.6150 2.9985 CLOSED
Sending 1st command again
[I2]Command Issued=REPORT ACTUATOR
Waiting For Response ...
Response = OK : 4.4168 3.6150 2.9985 CLOSED
Sending 1st command again
[I3]Command Issued=REPORT ACTUATOR
Waiting For Response ...
Response = OK : 4.4168 3.6150 2.9985 CLOSED
Ready For Next Command
Test System With User-defined Routines
```

Figure 5-4. Command Status window

## Function and Control Keys

Table 5-1 lists the function and control keys used in the diagnostic software.

<b>Key</b>	<b>Function</b>	<b>Description</b>
<b>F1 or Shift</b>	Help or extended help	Displays the help file. Use the <b>PageUp</b> and <b>PageDown</b> or the <b>Up/Down</b> arrow keys for navigation. Press the <b>Esc</b> key to exit the help file and return to your original position.
<b>F2</b>	View an error description	Displays the expanded error description for the last error returned. Press the <b>Esc</b> key to exit the error file.
<b>F3</b>	View the <i>TEST COMMAND</i> file	Displays a TEST command file stored on disk. This key is only valid for the user-defined tests listed in the lower section of the User Tests menu. Press the <b>Esc</b> key to exit the TEST command file.
<b>Enter or Return</b>	Make a selection	Selects a menu option, picks a specific parameter for a command or toggles (select/deselect) a configuration item.
<b>Home</b>	Show the Command Status window	Displays the Command Status window. Use the <b>PageUp</b> , <b>PageDown</b> or the <b>Up/Down</b> arrow keys to display information not currently in the window. Press the <b>Esc</b> key to restore the original window and resume operation.
<b>End</b>	Terminate loop mode	Loop Mode causes the software to send a command (or a series of commands defined in a test routine) continuously. Upon receiving the <b>End</b> key, the software waits for the current loop to complete, then terminates the command sequence and returns to the menu selection.

*continued*

**Table 5-1**  
**Diagnostic Software Function and Control Keys** *continued*

<b>Key</b>	<b>Function</b>	<b>Description</b>
<b>Ctrl+End</b>	Abort command	Aborts the current executing command and returns to the menu selection. When you press these keys, the software waits for the response of the most recent command, then terminates the command sequence and returns to the menu selection. This command terminates Loop Mode or Test Mode automatically. The response is displayed in the Command Status window.
<b>Alt+C</b>	Start capture mode	Starts capture mode by defining commands for test routines. Select the commands by pressing the <b>Enter</b> key at the desired menu option. The maximum number of commands that can be captured in a test file is 256. The maximum number of user-defined test routines is 15.
<b>Alt+E</b>	End capture mode	Terminates capture mode. The command sequence file that you created is saved on disk under the name that you specify with a file extension of <i>TST</i> . If a file already exists with that name, you can either append or overwrite the existing file. The new test routine is added to the User Test menu selection automatically.
<b>Up/Down</b> arrow <b>Left/Right</b> arrow	Menu navigation	Lets you move through the menu options.

## Location of Bins and Tape Drives

Figure 5-5 shows the numbering conventions for the tape library's fixed storage array bins, load port bins, and tape drives. This numbering convention is used in the diagnostic software.

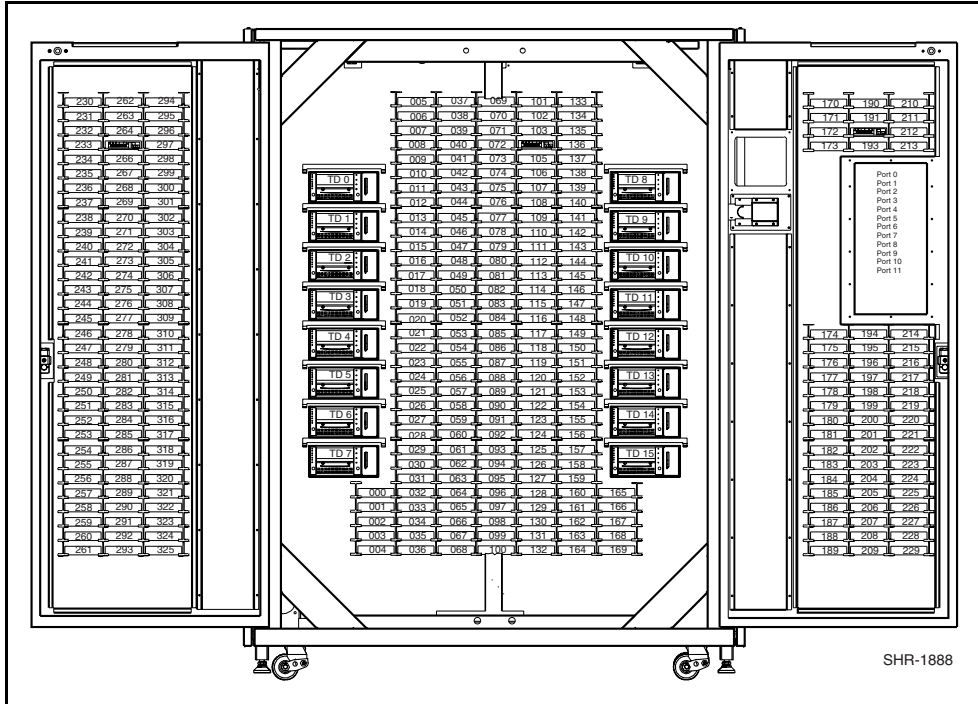


Figure 5-5. Tape library numbering conventions

## *Chapter* **6**

# **Using the Diagnostic Software**

The diagnostic software options are described in the following sections in the order in which they appear in the Main menu. The listing begins with the User Test menu and ends with the Config menu. Figure 6-1 shows the Main menu screen and Figure 6-2 shows the Diagnostic menu structure. An arrow (>) to the right of an option in a drop-down menu list indicates that a sub-menu exists.



## Main Menu

The Main menu screen displays six categories of diagnostic functions (see Figure 6-1).

- User Tests
- System
- Status
- Move Actuators
- Align/Calibrate
- Config

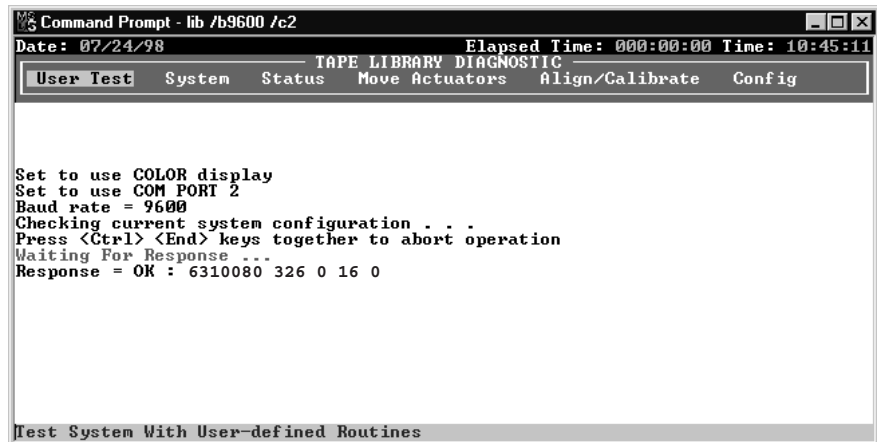
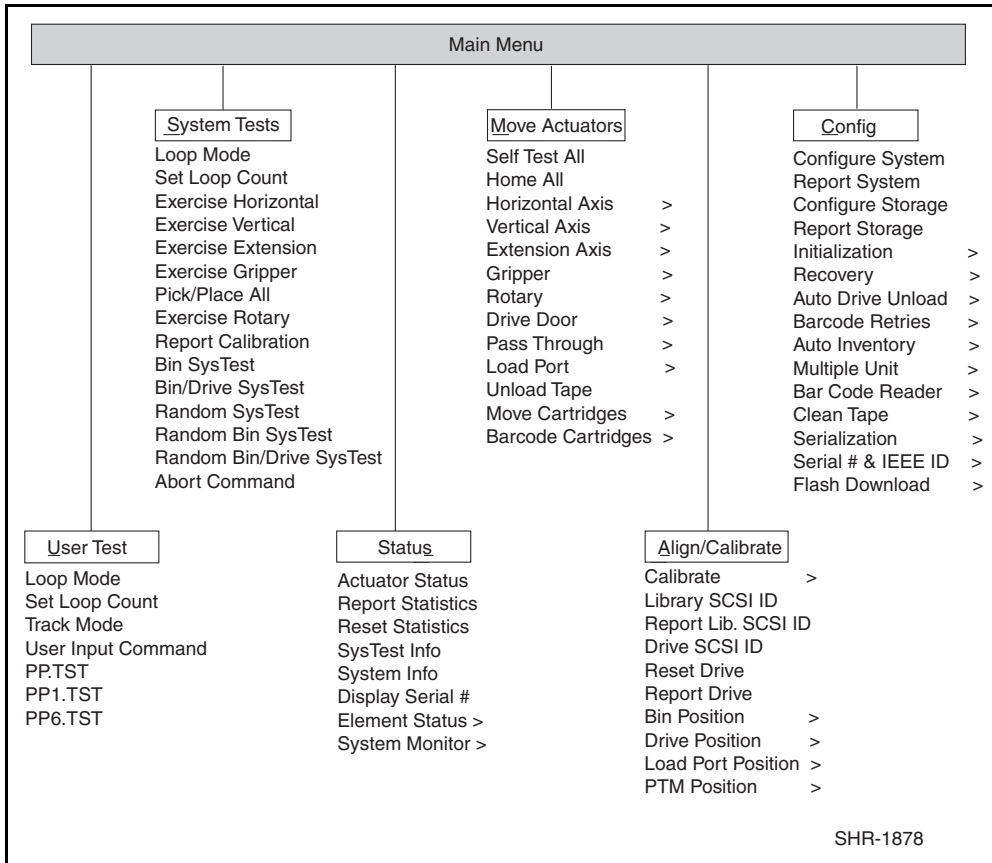


Figure 6-1. Main menu

To navigate the Main menu:

1. Use the **Left/Right** arrow keys to highlight one of the diagnostic categories.
2. When the category is highlighted, press the **Enter** key to select it. A drop-down menu appears listing the available options (see Figure 6-2).



**NOTE:** An arrow (>) to the right of an option indicates selection of that option will display a sub-menu.

Figure 6-2. Diagnostic software menu options

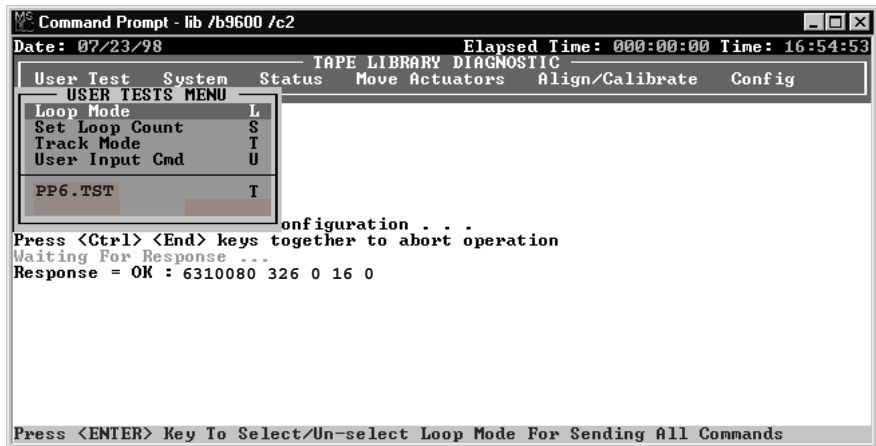
3. To execute an option, highlight it and press the **Enter** key. Press the **Esc** key to exit any sub-menu or pop-up window.

## User Tests Menu

The User Tests menu (see Figure 6-3) lets you:

- Enable or disable Loop Mode
- Set the number of times a command executes
- Log Command Status window messages to a designated disk file through Track Mode
- Display user-defined test script

Once you create a user-defined test script, the file name is displayed in the User Tests menu window below the User Input Cmd line.



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Figure 6-3. User Tests menu

## Loop Mode

Enabling Loop Mode causes the diagnostic software to send commands or sequences of commands continuously. When active, the Loop Mode option (in the drop-down menu) is prefaced with “>>” and Loop Mode flashes on and off in the top center of the screen.

To terminate commands running in Loop Mode, press the **End** key.

**NOTE:** When **End** is received, the software waits for the completion of the current command or cycle, then terminates the function and returns to the menu.

To enable Loop Mode:

1. Highlight User Test and press the **Enter** key.
2. Highlight Loop Mode and press the **Enter** key to enable the option. Loop Mode flashes on and off in the top center of the screen.

To disable Loop Mode:

1. With Loop Mode flashing at the top of the screen, highlight User Test and press the **Enter** key.
2. Highlight Loop Mode and press the **Enter** key to disable the option.

The flashing Loop Mode indicator at the top center of the screen disappears.

## Set Loop Count

The Set Loop Count option lets you select the number of times the tape library will perform a command or sequence of commands when Loop Mode is enabled.

For example, if Loop Mode is enabled, the loop count is set to five, and you select the EXERCISE GRIPPER command, the tape library will perform the EXERCISE GRIPPER command five times and then stop automatically.

To terminate commands running in Set Loop Count, press the **End** key.

**NOTE:** When **End** is received, the software waits for the completion of the current command or cycle, then terminates the function and returns to the menu.

To set the loop count:

1. Highlight User Test and press the **Enter** key.
2. Highlight Set Loop Count and press the **Enter** key.

TAPELIB displays a pop-up window prompting you to enter the desired loop count.

3. Use the numeric keys to enter the desired loop count, then press the **Enter** key.

You can select any value from 2 to 2000000000. The default value is 2000000000.

## Track Mode

This option lets you log all messages in the Command Status window to a user-defined disk file.

To enable the Track Mode:

1. Highlight User Test and press the **Enter** key.
2. Highlight Track Mode and press the **Enter** key to enable the option.

A pop-up window appears.

3. Type a file name and press the **Enter** key to define the disk file and enable the tracking mode.

**NOTE:** The file name is limited to eight alphanumeric characters. If you do not enter a file name when requested, the default file name is *TAPELIB*.

4. Verify that Track appears at the top center of the screen.

To disable Track Mode:

1. Highlight User Test and press the **Enter** key.
2. Highlight Track Mode and press the **Enter** key to disable the option.
3. Verify that Track no longer appears on the top center of the screen.

The message sequence is saved on disk in a file named *FILENAME.TRK*, where filename is the file name you specified above. The file is stored in the same directory with the diagnostic software program.

## User Input Command

This option lets you enter commands as an ASCII string of characters. It is a development tool not used during normal field service functions. When selected, a password must be entered before the function executes. The default is kvision.

To utilize the USER INPUT command:

1. Highlight User Test and press the **Enter** key.
2. Highlight User Input Cmd and press the **Enter** key to enable the option.  
A pop-up window appears.

3. At the Enter Password prompt, type in an authorized password and press the **Enter** key.
4. At the Enter Command line, type in a single line of text representing the function you want performed, for example, SELFTEST ALL.
5. Press the **Enter** key and the command is executed.

This command is equivalent to the menu selection, Move Actuators: Self Test All.

## PP6.TST

This test picks cartridges from and places cartridges into the drives and storage bins, exercising all major components of the system. Run PP6.TST as an overall test after servicing the tape library. This test can also be used with the Loop Mode as a demonstration of tape library operation.

**NOTE:** This test only exercises the first six drives. For a more extensive test, run SysTest.

To run PP6.TST:

1. Before running this option, verify the following conditions:
  - a. There are cartridges in slots 0-5 and 36.
  - b. All other storage bins are empty.
  - c. All drives are unloaded and ready to accept a cartridge.
  - d. The gripper is empty and ready to accept a cartridge.
  - e. The tape library has a current inventory of the cartridges.
2. Highlight User Test and press the **Enter** key.
3. Highlight PP6.TST and press the **Enter** key to run the test.

---

**IMPORTANT:** If the test is aborted, then the cartridges must be moved to satisfy the initial conditions described in step 1 before restarting the test.

---

**NOTE:** The best way to stop the test is to press the **End** key. This stops the test at the end of the loop. The test can then be restarted without moving cartridges. A loop takes approximately 15 minutes to complete.

## User-Defined Tests

This option lets you run diagnostic routines that you create. These routines appear at the bottom of the User Test menu. Create diagnostic routines by capturing one or more commands and saving the commands to a disk file. The routines can be created in normal (standby) mode or in simulation mode.

To capture commands:

1. Press the **Alt+C** keys to enter the User Defined Test function. A pop-up window appears.
2. Type in a file name and press the **Enter** key.

**NOTE:** The file name is limited to eight alphanumeric characters. If the file name you select already exists, you can choose to either append to it, or overwrite it.

3. Use the navigation arrows to highlight a test that you want to run, and then press the **Enter** key to execute and capture the command.
4. Repeat step 3 for all additional commands.
5. Press the **Alt+E** keys to end the capture mode.

The command sequence is saved on disk in a file named *FILENAME.TST*, where filename is the file name you specified above. All files with the *.TST* extension are automatically added to the User Tests menu and are selectable in the same manner as other options. The file is stored in the same directory with the Diagnostic Software Program.

To run a user-defines test:

1. Highlight User Test and press the **Enter** key.
2. Highlight the test that you want to run and press the **Enter** key to execute it.

## System Tests Menu

The System Tests Menu (see Figure 6-4) provides high-level command options that exercise the entire hardware components and test routines that run all tape library actuators.

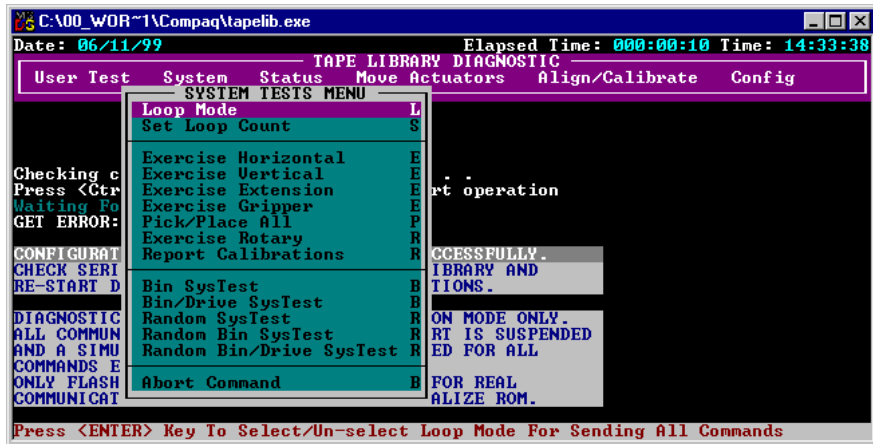


Figure 6-4. System Tests menu

## Loop Mode Test

See “Loop Mode” described earlier in this chapter for a detailed description of this option. The Loop Mode option is also included in this menu for ease of accessibility.

## Set Loop Count

See “Set Loop Count” described earlier in this chapter for a detailed description of this option. The Set Loop Count option is also included in this menu for ease of accessibility.

## Exercise Horizontal Test

This test homes the horizontal axis and moves it to two additional positions. Use it to verify the proper operation of the horizontal actuator and the horizontal home, limit, and confirmation sensors.

To exercise the horizontal axis:

1. Highlight System and press the **Enter** key.
2. Highlight Exercise Horizontal and press the **Enter** key.



## **Exercise Vertical Test**

This test homes the vertical axis and moves it to two additional positions. Use it to verify the proper operation of the vertical actuator and the vertical home and confirmation sensors.

To exercise the vertical axis:

1. Highlight System and press the **Enter** key.
2. Highlight Exercise Vertical and press the **Enter** key.

## **Exercise Extension Test**

Exercise Extension homes the extension axis and moves it to two additional positions. Use this test to verify the proper operation of the extension actuator and the extension home and limit sensors.

To exercise the extension axis:

1. Highlight System and press the **Enter** key.
2. Highlight Exercise Extension and press the **Enter** key.

## **Exercise Gripper Test**

This option closes and opens the gripper. Use it to verify the proper operation of the gripper actuator and the gripper open and close sensors.

To exercise the gripper:

1. Highlight System and press the **Enter** key.
2. Highlight Exercise Gripper and press the **Enter** key.

## **Pick/Place All Test**

This test picks a cartridge from each of the storage bins and moves it to a new storage bin location, exercising major components of the system in the process. Run Pick/Place All as an overall test after servicing the tape library or as a demonstration of tape library operation.

When the test routine starts, it picks the cartridge from storage bin 127 and moves it to bin 0. Then, it picks a cartridge from bin 84 and moves it to bin 127. This process continues until all cartridges have been picked and moved to a new bin location. The test then repeats this loop continuously.



**CAUTION:** Do not run Pick/Place All if you prefer to assign fixed locations for the tape cartridges within the tape library. This test moves cartridges but does not return them to their original locations.

---

**IMPORTANT:** Before running the Pick/Place All test, make sure these conditions are met:

1. All bin locations of the FSA contain a cartridge except storage bin 0.
  2. The gripper is empty and ready to accept a cartridge.
  3. The tape library has a current inventory of the cartridges.
- 

To run Pick/Place All:

1. Use the Pick from Bin option to remove the cartridge at storage bin 0. See the section on “Move Cartridges” for more information.
2. Remove the tape cartridge from the gripper by either using the Place into Load Port option to place the cartridge into the load port, from which it can be removed, or by using the Place into Drive option to place the cartridge into a tape drive.
3. Highlight System and press the **Enter** key.
4. Highlight Pick/Place All and press the **Enter** key to run the test. A pop-up Warning window appears.
5. Enter Y to continue the test or N to return to the previous menu then press the **Enter** key.

---

**IMPORTANT:** If the test is aborted, then the cartridges must be moved to satisfy the initial conditions described in step 1 before restarting the test.

---

**NOTE:** You can press the **End** key at any time to stop the test. Pressing the **End** key stops the test at the end of the present loop. The test can then be restarted without moving cartridges.

## **Exercise Rotary**

This option lets you exercise the rotary axis. Use this test to verify the rotary axis accuracy and proper operation as follows:

1. Highlight System and press the **Enter** key.
2. Highlight Rotary and press the **Enter** key.

## **Report Calibrations Test**

This test reports extension axis and vertical position values for each drive and for bin 0.

## **Bin SysTest**

This test picks tapes from and places to all bins. The test is sequential; it starts with bin 0 and continues in order through all storage bins.

The test finds a bin with a tape cartridge and places it into the next available bin. A test run is complete when the gripper has picked and placed to each bin.

## **Bin/Drive SysTest**

This test picks a tape from each bin and places to a drive and also picks from a drive and places to each bin. The test is sequential; it starts with bin 0 and continues in order through the bins.

The test finds a bin with a tape cartridge and places it into the next available drive. If no drive is available, the tape cartridge is placed into the next available bin. When a drive unloads a tape cartridge, it is picked from the drive and placed into the next available bin. A test run is complete when the gripper has picked and placed to each bin.

## **Random SysTest**

This test randomly picks from and places to both bins and drives.

The test randomly finds a bin with a tape cartridge and places it into the next available drive. If no drive is available, the tape cartridge is randomly placed into an available bin. When a drive unloads a tape cartridge, it is picked from the drive and randomly placed into an available bin. A test run is complete when the gripper has picked and placed to each bin.

## **Random Bin SysTest**

This test randomly finds a bin with a tape cartridge and randomly places it into an available bin. A test run is complete when the gripper has picked and placed to each bin.

## **Random Bin/Drive SysTest**

This test randomly moves tape cartridges between bins and drives. This test differs from the Random SysTest because it does not move tape cartridges between bins.

The test randomly finds a bin with a tape cartridge and places it into the next available drive. If no drive is available, then no moves are performed until an empty drive is available. When a drive unloads a tape cartridge, it is picked from the drive and randomly placed in an available bin. A test run is complete when the gripper has picked each bin and placed its tape cartridge to a drive or another bin.

## **ABORT Command**

This option aborts the command that is currently running.

## Status Menu

The Status Menu (see Figure 6-5) reports actuator status, statistical information, and system configuration information.

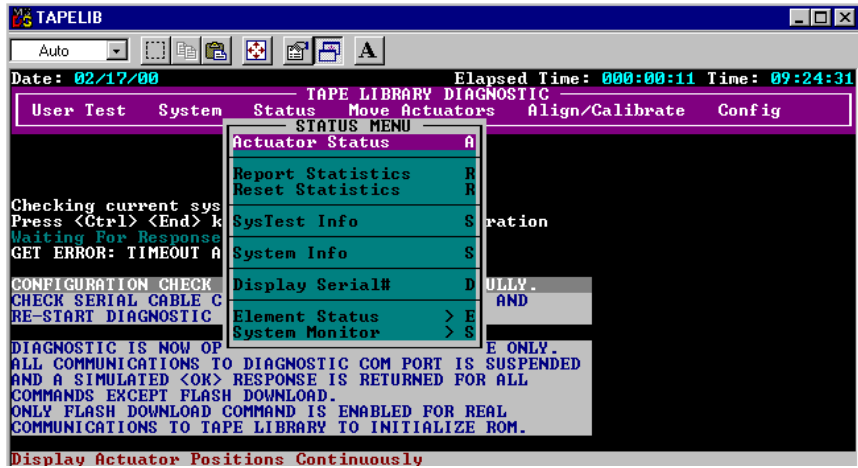


Figure 6-5. Status Menu

## Actuator Status

This option reports the position of each of the four actuators (horizontal, vertical, extension, and gripper) in the tape library. The Return Status window displays this information. Use this option to test each actuator for proper operation and tracking.



**CAUTION:** Perform a Self Test All and Home All before selecting Actuator Status. If you do not perform these functions, you might receive erroneous status information.

To display the status of the actuators:

1. Highlight Status and press the **Enter** key.
2. Highlight Actuator Status and press the **Enter** key. The Return Status window shows the position of every actuator in the tape library, pauses for four seconds, then updates the display with the current changes in the position of each actuator location.
3. Press the **End** key to terminate the report.

## Report Statistics

This option displays a screen of statistical information that is stored in tape nonvolatile RAM on the tape library robotics controller. The information returned includes:

- The total Power-On Hours (POH) for the tape library
- The command time
- The numbers of actuation for each of the axes
- The numbers of picks and places involving bins, drives, load port, and Pass-Through Mechanism (PTM)
- The number and type of retries performed by the tape library to continue its operation

To display the tape library statistics:

1. Highlight Status and press the **Enter** key.
2. Select Report Statistics and press the **Enter** key. The Return Status window displays the statistics.

## Reset Statistics

This option resets the statistics table. It is a development tool and is not used for normal field service functions. When selected, a password must be entered before the function is executed.

## SysTest Info

This option polls the tape library for the results of the last system test that was run on the tape library. The values are saved in nonvolatile RAM so that a power cycle to the tape library does not reset them.

The return string contains the following items in the following order:

- Total number of picks and places
- Last operations status (example: B8302)
- Total test time in msec
- Test type (examples: RANDOM or BIN)

- Average drive-to-bin move time in msec
- Average bin-to-drive move time in msec
- Average bin-to-bin move time in msec
- Longest move time in msec
- Number of bad bar code reads
- Number of places to drive 0 through 15
- Number of places to bins
- Number of places to load port
- Next-to-last operation (example: Pick B:10)
- Last operation (example: Place D:1)

## System Info

System Info reports the model number, current firmware revision, and configuration of the tape library.

To display the system information for the tape library:

1. Highlight Status and press the **Enter** key.
2. Select System Info and press the **Enter** key to display the information in a Return Status window.

## Display Serial #

This option lets you display the serial number of the tape library next to the date on the information line. You must first enter the serial number.

To display the serial number:

1. Highlight Status and press the **Enter** key.
2. Select Display Serial# and press the **Enter** key. A pop-up window appears.
3. Enter the serial number of the tape library and press the **Enter** key.

## Element Status

This option displays status information for the bins, loader, gripper, or drives (see Table 6-1).

**NOTE:** This function is not currently supported.

**Table 6-1**  
**Element Status Sub-Menu Functions**

Option	Description
Bin	Selecting this option reports the status of the selected bin.
Loader	Selecting this option reports the status of the loader.
Gripper	Selecting this option reports the status of the gripper.
Drive	Selecting this option reports the status of the selected drive.

To display the element status:

1. Highlight Element Status and press the **Enter** key.

A sub-menu appears.

2. Select one of the following options and press the **Enter** key:

- Bin
- Loader
- Gripper
- Drive
- PTM

3. Respond to any status-defining queries.

The status is reported.

## System Monitor

This option displays status information for the fan units, DC voltage levels, temperature sensors, DC power supplies, and AC power supplies.



Figure 6-6 shows the numbering conventions for the tape libraries fixed storage array bins, load port, and tape drives.

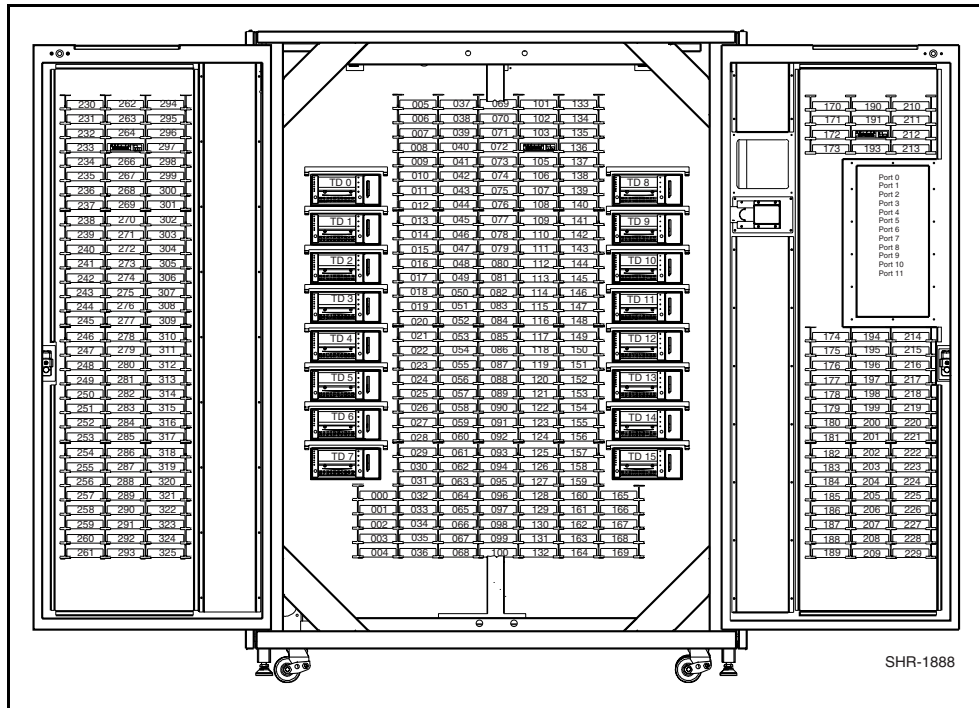
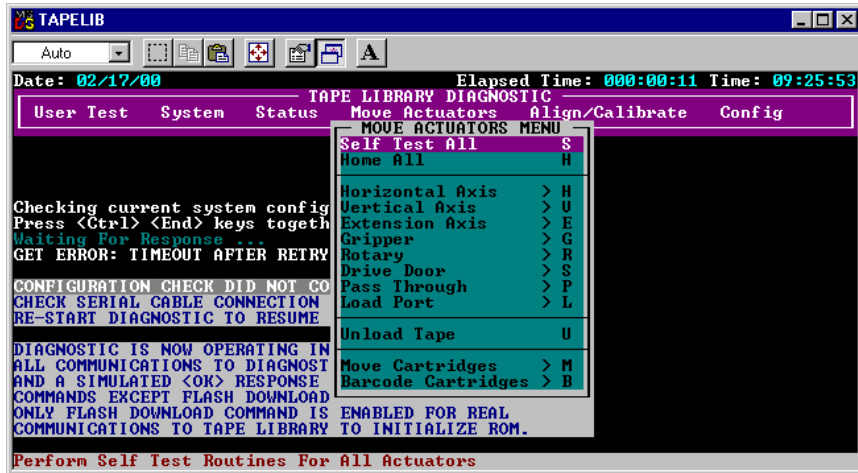


Figure 6-6. Tape library numbering conventions

## Move Actuators Menu

The Move Actuators menu (Figure 6-7) lets you:

- Test the tape library actuators and the tape drive insert/release handle.
- Unload cartridges from the tape drives.
- Move individual cartridges within the tape library.
- Read the bar code labels of individual cartridges.



3

Figure 6-7. Move Actuators menu

## Self Test All

This option tests the performance of the motors. Self Test All sends a short electrical pulse to the extension axis, gripper, and drive door motors and then reads the encoder or sensor data associated with each motor.

To self-test the motors in the system:

1. Highlight Move Actuators and press the **Enter** key.
2. Highlight Self Test All and press the **Enter** key.

## Home All

This option returns all actuators to their home positions.

To home all actuators:

1. Highlight Move Actuators and press the **Enter** key.
2. Highlight Home All and press the **Enter** key.

## Horizontal Axis

This option tests individual movements of the horizontal axis (see Table 6-2).

**Table 6-2**  
**Horizontal Axis Sub-Menu Functions**

Option	Description
Self Test	Performs a self-test of the horizontal axis.
Home	Returns the horizontal axis to its home position.
Move to Bin	Moves the horizontal axis directly in front of a bin location (0-325) that you specify via a pop-up window.
Move to Drive	Moves the horizontal axis directly in front of the drive (0-15) that you specify via a pop-up window.
Move to Load Port	Moves the horizontal axis directly in front of the load port bin (0-11) that you specify via a pop-up window.
Move to PTM	Moves the horizontal axis to the specific PTM (0-1) that you specify via a pop-up window.
Move to Position	Moves the horizontal axis to a position relative to the home location. Enter a number (in the pop-up window) to specify the position. The position is specified in inches. A positive number moves the axis toward the rear of the tape library. A negative number moves the axis toward the front.

To actuate the horizontal axis:

1. Highlight Move Actuators and press the **Enter** key.
2. Highlight Horizontal Axis and press the **Enter** key.
3. Highlight the desired test and press the **Enter** key.
4. For a Move to ... option, a pop-up windows displays prompting you to enter one of the following based on your selection:
  - a. Storage Bin: (0 to 325)
  - b. Drive Number: (0 to 15)
  - c. Load Port Bin: (0 to 11)
  - d. PTM Bin Number: (0=left, 1=right)
  - e. Position: (-2.00 to 36.00)
5. Enter the appropriate information and press the **Enter** key.

## Vertical Axis

This option tests individual movements of the vertical axis (see Table 6-3).

**Table 6-3**  
**Vertical Axis Sub-Menu Functions**

Option	Description
Self Test	Performs a self-test of the vertical axis.
Home	Returns the vertical axis to its home position.
Move to Bin	Moves the vertical axis directly in front of a bin location (0-325) that you specify via a pop-up window.
Move to Drive	Moves the vertical axis directly in front of the drive (0-15) that you specify via a pop-up window.
Move to PTM	Moves the vertical axis to the specific PTM (0-1) that you specify via a pop-up window.
Move to Load Port	Moves the vertical axis directly in front of the load port bin (0-11) that you specify via a pop-up window.
Move to Position	Moves the vertical axis to a position relative to the home location. Enter a number (in the pop-up window) to specify the position. The position is specified in inches. A positive number moves the axis toward the top of the tape library. A negative number moves the axis toward the bottom.

To actuate the vertical axis:

1. Highlight Move Actuators and press the **Enter** key.
2. Highlight Vertical Axis and press the **Enter** key.
3. Highlight the desired test and press the **Enter** key.
4. For a Move to ... option, a pop-up windows displays prompting you to enter one of the following based on your selection:
  - a. Drive Number: (0 to 15)
  - b. Position: (-1.50 to 52.00)
  - c. Bin# For Face: (0 to 23)
  - d. PTM Bin Number: (0=left, 1=right)
  - e. Load Port Bin: (0 to 11)
5. Enter the appropriate information and press the **Enter** key.

## Extension Axis

This option tests individual movements of the extension axis (see Table 6-4).



**CAUTION:** Make sure that the extension axis is returned to the Home position before leaving this menu. If a MOVE command is issued while the extension axis is in an extended position, the extension axis can be damaged.

**Table 6-4**  
**Extension Axis Sub-Menu Functions**

Option	Description
Self Test	Actuates the extension drive motor and then reads the returned encoder, home sensor, home sensor interrupt, and current feedback information to verify that the motor, encoder, and other sensors are working properly.
Home	Returns the extension axis to its home position.
Move to Drive	Moves the extension axis directly in front of the drive (0-15) that you specify via a pop-up window.
Move to PTM	Moves the extension axis to the specific PTM (0-1) that you specify via a pop-up window.
Move to Load Port	Moves the extension axis directly in front of the load port bin (0-11) that you specify via a pop-up window.
Move to Position	Moves the vertical axis to a position relative to the home location. Enter a number (in the pop-up window) to specify the position. The position is specified in inches. A positive number moves the axis toward the storage bins. A negative number moves the axis away from the storage bins.

To actuate the extension axis:

1. Highlight Move Actuators and press the **Enter** key.
2. Highlight Extension Axis and press the **Enter** key.
3. Highlight the desired test and press the **Enter** key.

4. For a Move to ... option, a pop-up windows displays prompting you to enter one of the following based on your selection:
  - a. Drive Number: (0 to 15)
  - b. Load Port Bin: (0 to 11)
  - c. PTM Bin Number: (0=left, 1=right)
  - d. Position: (-0.50 to 5.50)
5. Enter the appropriate information and press the **Enter** key.

## Gripper

This option tests individual movements of the gripper assembly (see Table 6-5).

**Table 6-5**  
**Gripper Sub-Menu Functions**

Option	Description
Self Test	Opens and closes the gripper jaw to verify proper functioning of the motor and the gripper sensors.
Home	Moves the gripper to its home (closed) position.
Open	Opens the gripper jaw.
Close	Closes the gripper jaw.

To actuate the gripper:

1. Highlight Move Actuators and press the **Enter** key.
2. Highlight Gripper and press the **Enter** key.
3. Highlight the desired test and press the **Enter** key.

## Drive Door

This option tests the stepper motors that control the Compaq tape drive insert/release handle (see Table 6-6).

**Table 6-6**  
**Drive Door Sub-Menu Functions**

<b>Option</b>	<b>Description</b>
Self Test	Opens and closes the drive door to verify proper functioning of the stepper motor and the sensor operation.
Home	Moves the drive door to its home (closed) position.
Open	Opens the drive door.
Close	Closes the drive door.

To actuate a tape drive door:

1. Highlight Move Actuators and press the **Enter** key. A pop-up window appears.
2. Highlight Drive Door and press the **Enter** key.
3. At the Drive Number (0 to 6): prompt, type the drive number and press the **Enter** key.
4. Highlight the desired test and press the **Enter** key. A pop-up window appears.

## Rotary

This option tests the tape library's rotary axis (see Table 6-7).

---

**Table 6-7**  
**Rotary Sub-Menu Functions**

<b>Option</b>	<b>Description</b>
Self Test	Performs a rotary axis self test.
Home	Moves the rotary axis to its home position.
Front	Rotates the axis to face the front.
Back	Rotates the axis to face the back.

To test the rotary axis:

1. Highlight Move Actuators and press the **Enter** key. A pop-up window appears.
2. Highlight Rotary and press the **Enter** key.
3. Highlight the desired test and press the **Enter** key. A pop-up window appears.



## Pass Through

This option tests the PTM (see Table 6-8).

**Table 6-8**  
**Pass Through Sub-Menu Functions**

<b>Option</b>	<b>Description</b>
Self Test	Performs a self test on the PTM.
Home	Moves the PTM to its home position.
Move Inside	Moves the PTM to the inside position.
Move Outside	Moves the PTM to the outside position.
Pick	Picks a cartridge from the PTM.
Place	Places a cartridge onto the PTM.

To test the PTM:

1. Highlight Move Actuators and press the **Enter** key. A pop-up window appears.
2. Highlight Pass Through and press the **Enter** key.
3. Highlight the desired test and press the **Enter** key. A pop-up window appears.

## Load Port

This option lets you insert or unload cartridges to and from the load port bins manually (see Table 6-9).

**Table 6-9**  
**Load Port Sub-Menu Functions**

Option	Description
Lock	Locks the load port.
Unlock	Unlocks the load port to open or close it.

To unlock the load port:

1. Highlight Move Actuators and press the **Enter** key.
2. Highlight Load Port and press the **Enter** key.
3. Highlight Unlock and press the **Enter** key.

## Unload Tape

This option performs the same function as the Unload button on the tape drive or the execution of an UNLOAD DRIVE command from the Operator's screen on the control panel. When the cartridge finishes rewinding to the beginning of the tape, actuating the drive door or picking the cartridge from the drive can eject it.

To unload a cartridge from the drive:

1. Highlight Move Actuators and press the **Enter** key.
2. Highlight Unload Tape and press the **Enter** key. A pop-up window appears.
3. At the Drive Number (0 to 15): prompt, enter the number of the drive containing the cartridge to be rewound and press the **Enter** key.

**NOTE:** When you execute this command, the tape cartridge will rewind completely. Depending on the tape position, it can take up to 2 minutes before the tape drive Operate Handle indicator lights.

## Move Cartridges

This option lets you move (pick or place) cartridges to and from bins (fixed storage bins and load port bins), tape drives, and the PTM (see Table 6-10). This test can also scan a bar code label from a cartridge in a specific location.

Before running this test, the library must have a current inventory of the cartridges. The gripper must also be empty before picking a cartridge from a bin or drive, and must be gripping a cartridge before placing a cartridge into a bin or drive.

---

**Table 6-10**  
**Move Cartridges Sub-Menu Functions**

---

Option	Description
Pick from bin	Picks a cartridge from a storage bin (0-325) that you specify via a pop-up window.
Pick from load port	Picks a cartridge from a load port bin (0-11) that you specify via a pop-up window.
Pick from PTM	Picks a PTM bin (0-1) that you specify via a pop-up window.
Pick from drive	Picks a cartridge from a tape drive (0-15) that you specify via a pop-up window.
Place into bin	Places a cartridge into a storage bin (0-325) that you specify via a pop-up window.
Place into load port	Places a cartridge into a load port bin (0-11) that you specify via a pop-up window.
Place into PTM	Places a cartridge into a PTM bin (0-1) that you specify via a pop-up window.
Place into drive	Places a cartridge into a tape drive (0-15) that you specify via a pop-up window.

---

To pick a cartridge:

1. Highlight Move Actuators and press the **Enter** key.
2. Highlight Move Cartridges and press the **Enter** key.
3. Highlight Pick From Bin, Pick From Load Port, Pick From PTM, or Pick From Drive and press the **Enter** key.

**NOTE:** There must be a cartridge in the source bin or drive you select.

4. For any selection, a pop-up window appears prompting you to enter one of the following, based on your selection in step 3:
  - Storage Bin: (0 to 325)
  - Load Port Bin: (0 to 11)
  - Drive Number: (0 to 15)
  - PTM Bin Number: (0=left, 1=right)
5. Enter the appropriate information and press the **Enter** key.

To place a cartridge:

1. Highlight Move Actuators and press the **Enter** key.
2. Highlight Move Cartridges and press the **Enter** key.
3. Highlight Place Into Bin, Place Into Load Port, Place Into PTM, or Place into Drive and press the **Enter** key.

**NOTE:** The destination bin or drive you select must be empty.

4. For any selection, a pop-up window appears prompting you to enter one of the following, based on your selection in step 3:
  - Storage Bin: (0 to 325)
  - Load Port Bin: (0 to 11)
  - Drive Number: (0 to 15)
  - PTM Bin Number: (0=left, 1=right)
5. Enter the appropriate information and press the **Enter** key.

## Bar Code Cartridges

This option reads the bar code for a designated cartridge (see Table 6-11). When the option is selected, specify the bin number, drive number, PTM, or load port bin for the operation.

**Table 6-11**  
**Bar Code Cartridges Sub-Menu Functions**

Option	Description
Bar code – bin	Reads the bar code of a cartridge located in a storage bin (0-325) that you specify via a pop-up window.
Bar code – drive	Reads the bar code of a cartridge located in a tape drive (0-15) that you specify via a pop-up window.
Bar code – load port	Reads the bar code of a cartridge located in a load port bin (0-11) that you specify via a pop-up window.
Bar code – PTM	Reads the bar code of a cartridge located in a PTM bin (0-1) that you specify via a pop-up window.
DISABLE	This command disables bar code scanning.
ENABLE	This command enables bar code scanning.
REPORT	This command reports the bar code scanning mode.

To read the bar code label of a cartridge:

1. Highlight Move Actuators and press the **Enter** key.
2. Highlight Move Cartridges and press the **Enter** key.
3. Highlight Bar Code – Bin, Bar Code – Drive, Bar Code – Load Port, or Bar Code – PTM and press the **Enter** key.

4. For any selection, a pop-up window appears prompting you to enter one of the following, based on your selection in step 3:
  - Storage Bin: (0 to 325)
  - Load Port Bin: (0 to 11)
  - Drive Number: (0 to 15)
  - PTM Bin Number (0=left, 1=right)
5. Enter the appropriate information and press the **Enter** key. The bar code information appears in the Return Status window.

## Align/Calibrate Menu

The Align/Calibrate menu (Figure 6-8) lets you:

- Calibrate all bin and tape drive locations in the tape library
- Selectively calibrate all storage bins, load port bins, drives, and PTMs
- Set and change the SCSI addresses of the tape library and drives
- Report detailed drive status

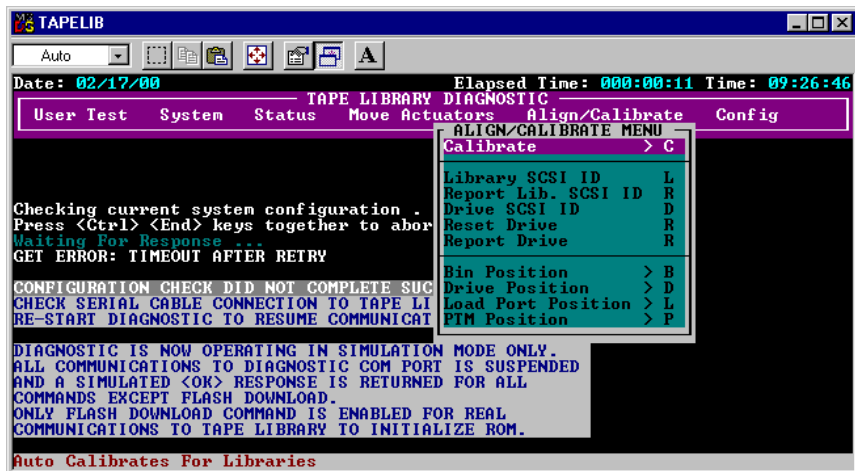


Figure 6-8. Align/Calibrate menu

## Calibrate

This option lets you calibrate the entire tape library or selectively calibrate all storage bins, load port bins, tape drives, or PTMs (see Table 6-12).

**Table 6-12**  
**Calibrate Menu Functions**

<b>Option</b>	<b>Description</b>
All	Calibrate the entire tape library.
Bin	Calibrate all storage bins.
Drive	Calibrate all tape drives.
Load Port	Calibrate all load port bins.
Selected PTM	Calibrate a selected PTM.
All PTMs	Calibrate all PTMs.
Service	Auto-calibrate all and save the target locations as a baseline for all subsequent calibration procedures.

To calibrate the tape library:

1. Highlight Align/Calibrate and press the **Enter** key.
2. Highlight Calibrate and press the **Enter** key.
3. Highlight the desired option and press the **Enter** key.

**NOTE:** Calibrate All takes approximately 20 minutes to complete.

## Tape Library SCSI ID

This option lets you set the SCSI ID (0-15) of the tape library. To set the SCSI ID of the tape library:

1. Highlight Align/Calibrate and press the **Enter** key.
2. Highlight Library SCSI ID and press the **Enter** key. A pop-up window appears.
3. At the SCSI ID: (0-15): prompt, enter the number representing the tape library SCSI ID and press the **Enter** key.

**NOTE:** After changing the SCSI address of the tape library, you must reset the SCSI bus either by issuing a SCSI BUS RESET command from the host or by turning the tape library OFF and ON.

## Report Lib. SCSI ID

This option displays the SCSI ID (0-15) in the Return Status window.

To display the SCSI ID of the tape library:

1. Highlight Align/Calibrate and press the **Enter** key.
2. Highlight Report Lib. SCSI ID and press the **Enter** key. The SCSI ID information displays in the Return Status window.

## Drive SCSI ID

This option lets you set the SCSI ID (0-15) of each drive in the tape library.

To set or change the SCSI ID of a drive:

1. Highlight Align/Calibrate and press the **Enter** key.
2. Highlight Drive SCSI ID and press the **Enter** key.
3. At the Drive Number (0-15): prompt, enter the drive SCSI ID and press the **Enter** key.



4. At the SCSI ID (0-15): prompt, enter the drive SCSI and press the **Enter** key.

**NOTE:** After changing the SCSI ID of a drive, you must reset the SCSI bus by one of the following methods:

- Select Reset Drive from the Align/Calibrate menu.
- Issue a SCSI BUS RESET command from the host.
- Turn the tape library OFF and ON.

To verify that the SCSI IDs are set as desired, type in the REPORT DRIVE command after the drives have been reset. For more information, see the section on "Reset Drive."

## Reset Drive

This option resets the drive ID. The drive must be reset after you issue the DRIVE SCSI ID command. This command takes approximately 10 seconds to complete.

To reset a drive's SCSI ID:

1. Highlight Align/Calibrate and press the **Enter** key.
2. Highlight Reset Drive and press the **Enter** key.
3. At the Drive Number (0-15): prompt, enter the drive number and press the **Enter** key.

## Report Drive

This option displays the configuration of each drive. The information reported includes:

- Drive model
- Drive serial number
- Drive and controller micro-code revisions
- Drive SCSI ID
- Other information about the drive state
- Drive hardware error
- Cleaning states

To display the configuration of a drive:

1. Highlight Align/Calibrate and press the **Enter** key.
2. Highlight Report Drive and press the **Enter** key.
3. At the Drive Number: prompt, enter the drive number (0-6) and press the **Enter** key.

The data for the selected drive appears in the Return Status window.

## Bin Position

This option lets you report or change the horizontal, vertical, and extension location values for each storage bin in the tape library.



**CAUTION:** Changing the calibration values can result in degraded operation of the tape library. Only trained field service engineers should use this option.

---

See “Location of Bins and Tape Drives” in Chapter 5 for a description of storage bin locations.

It is not possible to change any of the location values of one storage bin independently of all the other storage bins. Each bin location has the same horizontal and extension value as all other storage bins in a pack. Each bin location has a fixed vertical value relative to all other bin locations in that pack. When any storage bin location is changed, the values for all storage bin locations in that pack will be changed accordingly (see Table 6-13).

**Table 6-13**  
**Bin Position Sub-Menu Functions**

Option	Description
Current Vertical Pos	Current Vertical Pos updates the vertical location value for the specified bin with the current physical location of the vertical axis. When you highlight this option, the diagnostic software displays a WARNING pop-up window. Enter <b>Y</b> and press the <b>Enter</b> key to clear the warning. When cleared, enter the desired storage bin number and press the <b>Enter</b> key
Input Vertical Pos	Input Vertical Pos updates the vertical calibration value for the specified bin. Enter the desired storage bin number and the desired vertical calibration value.
Report Vertical Pos	Report Vertical Pos displays the current vertical calibration value for a specified bin. Enter the desired bin number, and the current vertical calibration value for that bin is displayed.
Current Extension Pos	Current Extension Pos saves the current physical location of the extension axis as the calibration value for that storage bin.
Input Extension Pos	Input Extension Pos updates the extension calibration value for the specified bin. Enter the desired storage bin number and the extension calibration value.
Report Extension Pos	Report Extension Pos displays the current extension calibration value for a specified bin.

*continued*

**Table 6-13**  
**Bin Position Sub-Menu Functions** *continued*

Option	Description
All-Current Hz. Pos	All-Current Hz. Pos updates the horizontal location values for all bins in the same column as the specified bin with the current physical location of the horizontal axis. The horizontal location values for bins in the other two columns are also updated so that the horizontal distance between the bins in adjacent columns is fixed at 4.600 inches.
All-Input Hz. Pos	All-Input Hz. Pos updates the horizontal calibration value for all bins in the same column as the specified bin. The horizontal location values in the other two columns are also updated so that the horizontal distance between the columns is fixed at 4.600 inches.
All-Report Hz. Pos	All-Report Hz. Pos displays the current horizontal calibration value for a specified bin. This command performs the same function as Pack-Report Hz. Pos.
Pack-Current Hz. Pos	Pack-Current Hz. Pos updates the horizontal location values for all bins in the same pack as the specified bin with the current physical location of the horizontal axis. The horizontal location values for bins in the other packs remain unchanged.
Pack-Input Hz. Pos	Pack-Input Hz. Pos updates the horizontal calibration value for all bins in the same pack as the specified bin. The horizontal location values for bins in the other packs remain unchanged.
Pack-Report Hz. Pos	Pack-Report Hz. Pos displays the current horizontal calibration value for a specified bin. This command performs the same function as All-Report Hz. Pos.

## Drive Position

This option lets you report or change the horizontal, vertical, and extension location values for each drive in the tape library (see Table 6-14).

**Table 6-14**  
**Drive Position Sub-Menu Functions**

<b>Option</b>	<b>Description</b>
Current Vertical Pos	Current Vertical Pos updates the vertical location value for the specified drive with the current physical location of the vertical axis. When you highlight this option, the diagnostic software displays a WARNING pop-up window. Enter <b>Y</b> and press the <b>Enter</b> key to clear the warning. When cleared, enter the desired drive number and press the <b>Enter</b> key.
Input Vertical Pos	Input Vertical Pos Input Vertical Pos updates the vertical calibration value for the specified drive. Enter the desired drive number and the desired vertical calibration value.
Report Vertical Pos	Report Vertical Pos displays the current vertical calibration value for a specified drive. Enter the desired drive number, and the current vertical calibration value for that drive is displayed.
Current Extension Pos	Current Extension Pos saves the current physical location of the extension axis as the calibration value for that drive.
Input Extension Pos	Input Extension Pos updates the extension calibration value for the specified drive. Enter the desired drive number and the desired extension calibration value.
Report Extension Pos	Report Extension Pos displays the current extension calibration value for a specified drive.
Current Horiz. Pos	Current Horiz. Pos updates the horizontal location value for the selected drive with the current physical location of the horizontal axis.
Input Horiz. Pos	Input Horiz. Pos updates the horizontal calibration value for the selected drive with the input value.
Report Horiz. Pos	Report Horiz. Pos displays the current horizontal calibration value for a specified drive.

## Load Port Position

This option lets you report or change the horizontal, vertical, and extension location values for the load port bins in the tape library (see Table 6-15).

**Table 6-15**  
**Load Port Position Sub-Menu Functions**

Option	Description
Current Vertical Pos	Current Vertical Pos updates the vertical location value for the specified load port bin with the current physical location of the vertical axis. When you highlight this option, the diagnostic software displays a WARNING pop-up window. Enter <b>Y</b> and press the <b>Enter</b> key to clear the warning. When cleared, enter the desired load port bin number and press the <b>Enter</b> key.
Input Vertical Pos	Input Vertical Pos Input Vertical Pos updates the vertical calibration value for the specified load port bin. Enter the desired load port bin number and the desired vertical calibration value.
Report Vertical Pos	Report Vertical Pos displays the current vertical calibration value for a specified load port bin. Enter the desired load port bin number, and the current vertical calibration value for that load port bin is displayed.
Current Extension Pos	Current Extension Pos saves the current physical location of the extension axis as the calibration value for that load port bin.
Input Extension Pos	Input Extension Pos updates the extension calibration value for the specified load port bin. Enter the desired load port bin number and the desired extension calibration value.
Report Extension Pos	Report Extension Pos displays the current extension calibration value for a specified load port bin.
Current Horiz. Pos	Current Horiz. Pos updates the horizontal location value for the selected load port bin with the current physical location of the horizontal axis.
Input Horiz. Pos	Input Horiz. Pos updates the horizontal calibration value for the selected load port bin with the input value.
Report Horiz. Pos	Report Horiz. Pos displays the current horizontal calibration value for a specified load port bin.

## PTM Position

This option lets you report or change the horizontal, vertical, and extension location values for the PTM bins in the tape library (see Table 6-16).

**Table 6-16**  
**PTM Position Sub-Menu Functions**

<b>Option</b>	<b>Description</b>
Current Vertical Pos	Current Vertical Pos updates the vertical location value for the specified PTM bin with the current physical location of the vertical axis. When you highlight this option, the diagnostic software displays a WARNING pop-up window. Enter <b>Y</b> and press the <b>Enter</b> key to clear the warning. When cleared, enter the desired PTM bin number and press the <b>Enter</b> key.
Input Vertical Pos	Input Vertical Pos Input Vertical Pos updates the vertical calibration value for the specified PTM bin. Enter the desired PTM bin number and the desired vertical calibration value.
Report Vertical Pos	Report Vertical Pos displays the current vertical calibration value for a specified PTM bin. Enter the desired PTM bin number, and the current vertical calibration value for that PTM bin is displayed.
Current Extension Pos	Current Extension Pos saves the current physical location of the extension axis as the calibration value for that PTM bin.
Input Extension Pos	Input Extension Pos updates the extension calibration value for the specified PTM bin. Enter the desired PTM bin number and the desired extension calibration value.
Report Extension Pos	Report Extension Pos displays the current extension calibration value for a specified load port bin.
Current Horiz. Pos	Current Horiz. Pos updates the horizontal location value for the selected PTM bin with the current physical location of the horizontal axis.
Input Horiz. Pos	Input Horiz. Pos updates the horizontal calibration value for the selected PTM bin with the input value.
Report Horiz. Pos	Report Horiz. Pos displays the current horizontal calibration value for a specified PTM bin.

## Config Menu

The Config Menu (Figure 6-9) lets you:

- Set or display the overall tape library configuration
- Initialize an inventory sequence, NVRAM, or init PTM inventory
- Enable or disable recovery options or the tape cleaning feature
- Perform a flash download
- Enable or disable bar code reading and set number of tries
- Enable or disable Autodrive Unload feature
- Enable/disable Auto Clean and view current states
- Configure multi-unit settings

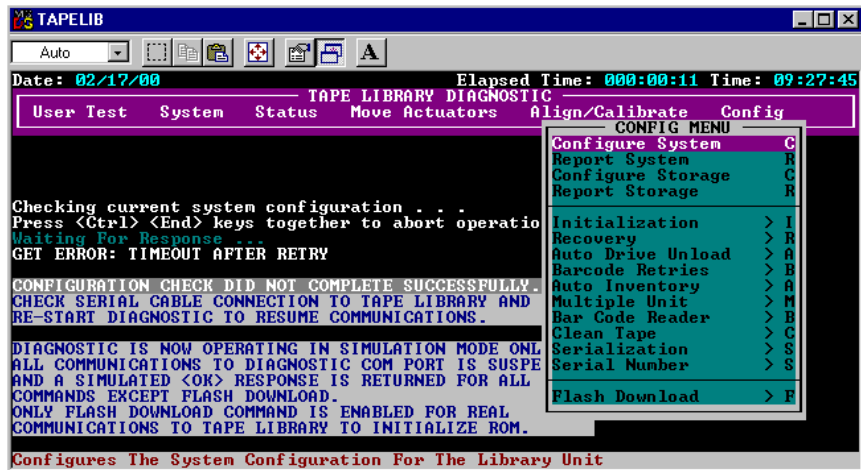


Figure 6-9. Config Menu



## Configure System

This option lets you select the proper model number of the ESL9326 tape library (see Table 6-17).

**Table 6-17**  
**Tape Library Model Numbers**

Model #	Tape Library Model Name	Displayed Name	Standard Vendor ID	Standard Product ID	Number of Storage Bins	Drive Type
6310080 (def)	ESL9326D	ESL9326D	Compaq	ESL9000 Series	326	TZ89
6310081	ESL9326D	ESL9326D	Compaq	ESL9000 Series	170	TZ89
6310082	ESL9326D	ATL P3000	ATL	P3000 6310082	326	TZ89 or DLT8000
6310085 (def)	ESL9326DX	ESL9326DX	Compaq	ESL9000 Series	326	DLT8000

To configure the tape library:

1. Highlight Config and press the **Enter** key.
2. Highlight Configure System and press the **Enter** key. A pop-up window appears.
3. From the list of available model numbers, select 6310xxx and press the **Enter** key.
4. After the model number appears, fill in the xxx with 080.
5. Enter 326 as the number of bins and press the **Enter** key.
6. Enter the number of drives in the tape library and press the **Enter** key.
7. Enter the desired SCSI ID of the tape library and press the **Enter** key.

## Report System

This option displays the current tape library configuration, including model number, number of bins, number of drives, and the tape library SCSI ID in a Return Status window.

To display the current tape library configuration:

1. Highlight Config and press the **Enter** key.
2. Highlight Report System and press the **Enter** key. The information appears in the Return Status window.

## Configure Storage

This option lets you eliminate specified sections of the tape library from the inventory process. Eliminating specified sections speeds up the time it takes the tape library to perform an inventory (see Table 6-18).

**Table 6-18**  
**Configure Storage Details**

<b>Selections</b>	<b>Command Options</b>	<b>Default</b>
Back pack	Unavailable/storage	Storage
Left-front door pack	Unavailable/storage	Storage
Right-front door pack	Unavailable/storage	Storage
Load port	Unavailable/import/export	Import/export
Pass through	Availability list/unavailable	Availability list

## Report Storage

This option reports the status of the current selection.

## Initialization

### Init Inventory

This option starts a tape cartridge inventory sequence that scans the cartridges in the storage bins, load port bins, and tape drives, and then records the location and identity of all tape cartridges with bar codes. If all bins in the tape library are filled with tape cartridges (no empty bins) and these cartridges all have bar code labels, the entire inventory takes approximately 5 minutes. Inventories of tape libraries with unlabeled tape cartridges will take longer.

To initialize the inventory of the cartridges in the tape library:

1. Highlight Config and press the **Enter** key.
2. Highlight Init Inventory and press the **Enter** key.

### Init Non-Vol RAM

This option initializes or resets the NVRAM.

To initialize the NVRAM:

1. Highlight Config and press the **Enter** key.
2. Highlight Init Non-Vol RAM and press the **Enter** key. A pop-up window appears.
3. At the prompt, enter **Y** and press the **Enter** key.

**NOTE:** The tape library must be calibrated after this procedure.

## Init PTM Inventory

This option starts a tape cartridge inventory sequence that scans the tape cartridges in the PTM.

To start the tape cartridge inventory:

1. Highlight Config and press the **Enter** key.
2. Highlight Init PTM Inventory and press the **Enter** key. A pop-up window appears.
3. At the prompt, enter **Y** and press the **Enter** key.

## Recovery

This option accesses a sub-menu with the following options:

- Enable Recovery
- Disable Recovery
- Report Recovery

---

**IMPORTANT:** When the tape library is powered on, the enable/disable recovery switch is automatically set to be enabled. This is the default condition for Enable Recovery. Enable Recovery should remain enabled except when troubleshooting a problem.

---

### Enable Recovery

When recovery is enabled, the tape library attempts to recover from internal anomalies to complete a command sent from the diagnostic PC or host.

To enable recovery:

1. Highlight Config and press the **Enter** key.
2. Highlight Recovery and press the **Enter** key.
3. Highlight Enable Recovery and press the **Enter** key.

## Disable Recovery

When recovery is disabled, a command that cannot be successfully completed on the first attempt will immediately generate an error response.

---

**IMPORTANT:** Always leave recovery enabled when returning the tape library to the online state for operator use.

---

To disable error recovery:

1. Highlight Config and press the **Enter** key.
2. Highlight Recovery and press the **Enter** key.
3. Highlight Disable Recovery and press the **Enter** key.

## Report Recovery

This option reports the current recovery setting (enabled or disabled).

To report the current recovery setting:

1. Highlight Config and press the **Enter** key.
2. Highlight Recovery and press the **Enter** key.
3. Highlight Report Recovery and press the **Enter** key.

## Auto Inventory

When this option is enabled, the tape library performs an inventory automatically when the tape library is powered up. The default setting is enabled.

When you select Auto Inventory, a sub-menu with the following options appears:

- Enable
- Disable
- Report (reports whether Auto Inventory is enabled or disabled)

## No Bar Code

When this option is enabled, the tape library does not scan bar codes but instead uses the cartridge-in-gripper sensor to determine the presence of a cartridge in each drive and storage bin.

When this option is disabled, the tape library scans bar codes during the inventory process. The default setting is disabled.

When you select No Bar Code, a sub-menu with the following options appears:

- Enable
- Disable
- Report (reports whether No Bar Code is enabled or disabled)

## Bar Code Retries

The diagnostic software supports bar code read retries. The default value is eight retries, but one to eight retries can be selected.

## Auto Drive Unload

This option adds an UNLOAD DRIVE command to a MOVE command when the source element is a tape drive. The default setting is enabled.

## Clean Tape

This option accesses a sub-menu with the following options:

- Enable Clean Tape
- Disable Clean Tape
- Report Clean Tape

## **Enable Clean Tape**

This activates auto-cleaning.

**NOTE:** Enabling or disabling auto-cleaning through the diagnostic software is temporary. When the tape library power is cycled, the auto-cleaning mode reverts to the last state selected by the host controller via the MODE SELECT command. Auto-cleaning is disabled by default.

To enable auto-cleaning:

1. Highlight Config and press the **Enter** key.
2. Highlight Clean Tape and press the **Enter** key.
3. Highlight Enable Clean Tape and press the **Enter** key.
4. Verify, through Report Clean Tape, that auto-cleaning has been enabled.

## **Disable Clean Tape**

This deactivates auto-cleaning. To disable auto-cleaning:

1. Highlight Config and press the **Enter** key.
2. Highlight Clean Tape and press the **Enter** key.
3. Highlight Disable Clean Tape and press the **Enter** key.
4. Verify, through Report Clean Tape, that auto-cleaning has been disabled.

## **Report Clean Tape**

This reports auto-cleaning status information (in the Return Status window). Status information includes:

- Whether auto-cleaning is enabled or disabled
- For each drive, whether cleaning is needed or not
- Bin location and number of uses for each cleaning cartridge in the tape library

To display the state of the auto-cleaning feature:

1. Highlight Config and press the **Enter** key.
2. Highlight Clean Tape and press the **Enter** key.
3. Highlight Report Clean Tape and press the **Enter** key. The information appears in the Return Status window.

## Flash Download

The flash download process is used to load robotics/control panel firmware revisions through the serial port. The firmware downloaded through this method remains in the tape library until new robotics/control panel firmware is downloaded.



**CAUTION:** To reduce the risk of damage to the control panel, only Compaq authorized service providers should perform flash downloads.

Flash downloads should only be performed from native MS-DOS, not from the MS-DOS program running under Windows 95/98 or Windows NT.

---

**NOTE:** The firmware hex file must be copied into the same directory as TAPELIB before it can be downloaded to the tape library.

## Flash Download

To perform a flash download for the robotics firmware:

1. Press the **Standby** button on the tape library control panel.
2. Connect a RS-232 cable between the diagnostic PC and the DIAGS port at the rear of the tape library.
3. Move to the TAPELIB directory on the diagnostic PC (in native MS-DOS and type:

TAPELIB/B9600

4. Highlight Config and press the **Enter** key.
5. Highlight Flash Download and press the **Enter** key.



6. Highlight the file you want to download to the tape library and press the **Enter** key.
7. Enter **Y** and press the **Enter** key at the prompt. The download takes approximately 45 minutes. When complete, Flash Download Complete appears in the Command Status window.
8. After the download has completed successfully, cycle power to the tape library.



**CAUTION:** When restarting the tape library, leave the power off at least 15 seconds before turning the power back on.

---

9. Place the tape library in Standby mode and perform the calibration functions described in the section “Calibrate.”

### **Flash Download Troubleshooting**

If the flash download you performed is not successful:

- Verify that the cable connections between the PC and tape library are securely in place.
- Verify that the firmware image is the correct image type for this tape library and is in the TAPELIB sub-directory.
- Be sure you are performing the flash download in native MS-DOS.
- Retry the flash download in normal (Standby) mode or Simulation mode.
- Verify that the baud rate is 9600.

## Initializing the Tape Library

This option lets you initialize the tape library and return it to the factory default settings.

To initialize the tape library:

1. Initialize the nonvolatile RAM.
2. Configure the tape library for the number of existing drives. You can do this in one of the following ways:
  - a. Use the Configure System option in the diagnostic software. For more information, see the previously described section on “Configure System.”
  - b. Press the **Configure Library** button on the Operator screen of the control panel. When the Configure Library screen appears, press **Configure** to change the current settings. Refer to the *Compaq StorageWorks ESL9326 Tape Library Reference Guide* for more information.
3. Restart the tape library.

**NOTE:** The tape library must be calibrated after this procedure. For more information, see the previously described section on “Calibrate.”

# Chapter 7

## Exiting the Diagnostic Software

To exit the diagnostic software program:

1. Press the **Esc** key repeatedly until the Exit Diagnostic Program screen appears (see Figure 7-1).
2. Select **Y** and then press the **Enter** key.

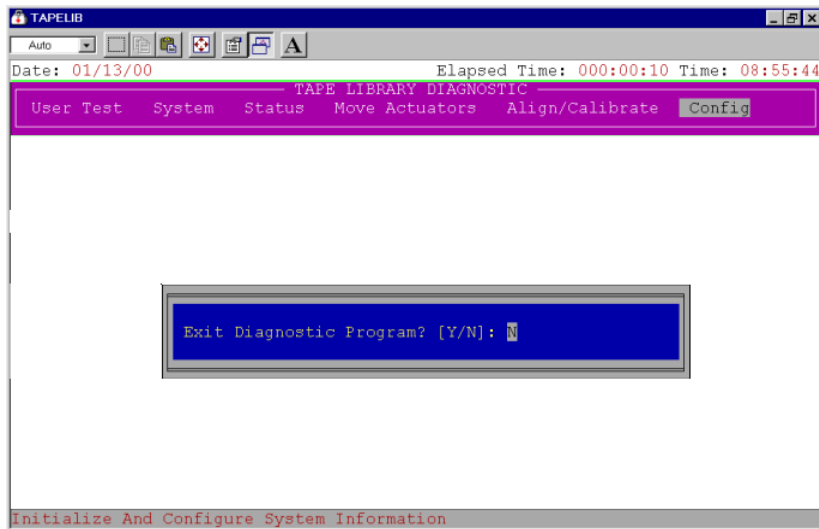


Figure 7-1. Exit Diagnostic Program screen


# Glossary

- abort** To cancel or terminate a program, command, or procedure while in progress.
- Abort button** A button appearing on control panel Command In Progress screens, for use in canceling or terminating a command or operation in progress.
- actuator** One of the components that make up tape library robotics. Actuators consist of the gripper, extension axis, vertical axis, and horizontal axis.
- array** A physical or logical structure with multiple rows and columns that a system or program treats as a single unit.
- Arrow buttons** Buttons found in various control panel screens used to scroll through lists.
- Autoclean** A user-defined mode in which the tape library automatically performs drive cleaning tasks as needed.
- Autoload** A user-defined mode in which the tape library automatically moves cartridges in the load port to empty storage bins as soon as the load port door is closed.
- automated tape library** An enclosed data storage system consisting of storage elements, data transfer elements, DLT cartridges, and a robotic gripping mechanism used to identify, handle, and move the cartridges from one element to another.
- Back button** A control panel button that allows a backward movement through previously selected screens.
- Backspace button** A button with a left-pointing arrow icon, found in control panel screens with the keypad, that allows the elimination of a partial numeric entry character-by-character.

<b>bar code</b>	A printed pattern of vertical bars of varying widths used for computerized inventory control.
<b>bar code label</b>	A tape cartridge identification label that includes a bar code.
<b>bar code scanner</b>	A device mounted on the extension axis that reads the cartridge bar code labels.
<b>bit</b>	The basic unit of information in a binary numbering system (binary digit). A bit is represented by either a 1 or 0. 8 bits make up each byte.
<b>bus</b>	An interface designed to send and receive data.
<b>byte</b>	The basic unit of computer memory, large enough to hold one character. A byte is composed of 8 bits.
<b>calibration</b>	A process used by the tape library robotics to determine the exact position of storage, data transfer, and import/export elements.
<b>cartridge</b>	A case containing a supply reel with magnetic tape used as media for reading and writing computer data.
<b>cartridge handling mechanism</b>	A mechanism used to pick and place tape cartridges.
<b>CHM</b>	See Cartridge Handling Mechanism.
<b>command</b>	A user-initiated signal given to a computer program that initiates, terminates, or otherwise controls the execution of a specific operation. In a menu-driven system such as the tape library control panel, choose commands by pressing on-screen button.
<b>compression</b>	The process of encoding data to take up less storage space on magnetic tape. Compression may be carried out by the host computer (software compression) or by the drive (hardware compression).
<b>Contrast buttons</b>	Control panel buttons in the upper right corner of the display that adjust the contrast of the control panel screen.
<b>control panel</b>	The panel on the front of the tape library that contains the tape library status displays.
<b>data transfer element</b>	The SCSI designation for a disk or tape drive.
<b>digital linear tape</b>	A 0.5-inch, high-grade, metal-particle magnetic tape medium housed in a 4.1 x 4.1 x 1-inch cartridge. DLT technology is the intellectual property of Quantum Corporation.

<b>DLT</b>	See digital linear tape.
<b>drive access doors</b>	The left and right side doors of the tape library used to access tape drives for replacement or cabling.
<b>element</b>	A SCSI designation for any device or bin in the tape library that can hold a DLT cartridge. SCSI elements include storage bins, tape drives, load port bins, and the gripper.
<b>error message</b>	A message appearing on the host computer or tape library control panel screen showing that the program was unable to carry out the desired operation.
<b>execute</b>	To carry out the instructions in a computer program.
<b>exercise</b>	A user-initiated, continuous operation in which the tape library robotics randomly moves tape cartridges from one tape library element to another. The exercise operation runs continuously until aborted.
<b>extension axis</b>	Mounted on the vertical axis, an assembly that consists of the gripper and the horizontal axis upon which the gripper assembly is mounted.
<b>FCC Class A</b>	A standard established by the U.S. Federal Communications Commission governing electromagnetic emissions in a commercial environment.
<b>fixed storage array</b>	The matrix of all storage elements in the tape library.
<b>Forward button</b>	A control panel button that allows a forward movement through previously selected screens.
<b>GB</b>	See gigabyte.
<b>gigabyte</b>	A unit of measure for computer memory consisting of approximately 1 billion bytes (1,073,741,824) or 1,000 megabytes.
<b>graphical user interface</b>	A user interface made up of bit-mapped graphics resembling buttons and switches, designed to make it simpler to obtain information and choose and execute commands.
<b>gripper</b>	An electromechanical assembly mounted on the extension axis that includes a sensor for reading bar codes and a gripping mechanism for handling DLT cartridges.
<b>GUI</b>	See graphical user interface.
<b>Home button</b>	A control panel button that allows a return to the initial control panel screen.

<b>horizontal carriage</b>	The rails, belt, and mechanisms that cause the extension axis to move from the front of the tape library to the back.
<b>host computer</b>	The computer that issues SCSI commands to control the tape library robotics.
<b>import/export element</b>	The SCSI designation for a load port bin.
<b>interface</b>	A hardware or software protocol, contained in the electronics of the tape controller and tape drive, that manages the exchange of data between the drive and computer.
<b>inventory</b>	An operation in which the tape library determines the identity and location of all tape cartridges and SCSI elements.
<b>LCD</b>	Liquid crystal display.
<b>load port</b>	The small revolving door on the front panel of the tape library for loading and unloading tape cartridges.
<b>Load Port button</b>	A button on the control panel that opens or unlocks the load port, depending on the load port's current state.
<b>Lock icon</b>	Another name for the security level indicator on the control panel.
<b>media</b>	The material or device used to store information in a storage subsystem. The magnetic tape used in tape cartridges is an example of high-grade media.
<b>nonvolatile RAM</b>	Battery-powered RAM used to store tape library configuration information even when the tape library is turned off.
<b>NVRAM</b>	See nonvolatile RAM.
<b>offline</b>	A state in which the tape library is not ready for communications with a host. The tape library must be placed in off-line mode before opening tape library doors, removing tape library cosmetic panels, or performing certain tape library commands such as configure tape library.
<b>online</b>	A state in which the tape library is ready for communications with a host.
<b>Operate Axes Test</b>	A system test initiated from the Service screen in the control panel that allows the testing of each tape library axis in various ways.
<b>password</b>	A sequence of characters used to gain access to protected portions of the computer system. The control panel has an operator password and a service password consisting of 4 to 8 numeric characters.

<b>pick</b>	The process of removing a cartridge from a source element in preparation for placing it in a destination element.
<b>place</b>	The process of placing a cartridge in a destination element after it has been picked from source element.
<b>RAM</b>	Random access memory. An integrated circuit memory chip that allows information to be stored and retrieved by a microprocessor or controller while the computer is running.
<b>rear panel</b>	The rear cosmetic panel of the tape library that contains the AC power switch, AC power receptacle and connectors for attaching external cabling to the tape library.
<b>retry</b>	The process of automatically attempting a failed command before issuing an error message.
<b>SCSI</b>	Small computer system interface. An American National Standards Institute (ANSI) communications standard for attaching peripheral equipment to computers.
<b>SCSI device</b>	A computer or computer peripheral connected to a SCSI bus. SCSI devices include the tape library robotics, host computers, tape library tape drives, and hard disk drives.
<b>SCSI ID</b>	A unique address (0 to 15) assigned to each device on a SCSI bus.
<b>security level indicator</b>	A small “lock” icon (  ) on the control panel that shows the current security level setting. Five security levels are available: service (S), operator (O), user (U), import only (I), and locked (L).
<b>Standby button</b>	A control panel button that switches the tape library between on-line and off-line states.
<b>Stop button</b>	A control panel button that halts all tape library activity by cutting power to tape library robotics. Pressing the Stop button a second time restores power to tape library robotics.
<b>storage array door</b>	The door used to access the gripper and the fixed storage array.
<b>storage bin</b>	Any of the small, rectangular containers that make up the fixed storage array, designed to hold a single DLT cartridge.
<b>storage element</b>	The SCSI designation for a storage bin.
<b>Systest tape library</b>	A system test initiated from the Service screen in the control panel that tests all tape library components by swapping tape cartridges.



<b>tape drive</b>	The mechanism that reads data from and writes data to a tape cartridge.
<b>tape library system</b>	A storage and retrieval system that uses a robotic mechanism to automatically load and unload tape cartridges into one or more tape drives.
<b>UL</b>	Underwriters Laboratories.
<b>Unload button</b>	A button on the tape drive that prepares a tape cartridge for removal from the drive. When this button is pressed, the drive rewinds the tape back into the cartridge.
<b>Unload Drive button</b>	A control panel button in the Operator screen that allows the unloading of a tape drive.
<b>Unload Imp/Exp button</b>	A control panel button in the Operator screen that allows the unloading of the load port when the Auto Load feature is disabled.
<b>vertical carriage</b>	The rails, belts, and other mechanisms that cause the extension axis to move from the top of the tape library to the bottom.
<b>write-enable</b>	To set a tape cartridge so that data can be written to it.
<b>write-protect</b>	To set a tape cartridge so that data cannot be written to it or erased from it.

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