

Compaq StorageWorks

SSL2000 Series Library

Maintenance and Service Guide

First Edition (May 2000)
Part Number 187195-001
Compaq Computer Corporation

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Compaq StorageWorks SSL2000 Series Library Maintenance and Service Guide
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About This Guide

This Maintenance and Service Guide is a troubleshooting guide that can be used for reference when servicing Compaq StorageWorks SSL2000 Series Libraries.



WARNING: To reduce the risk of personal injury from electrical shock and hazardous energy levels, only authorized service technicians should attempt to repair this equipment. Improper repairs could create conditions that are hazardous.

IMPORTANT: The installation of options and servicing of this product shall be performed by individuals who are knowledgeable of the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

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.

Compaq Technician Notes



WARNING: Only authorized technicians trained by Compaq should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indications of component replacement or printed wiring board modifications may void any warranty.



WARNING: To reduce the risk of personal injury from electrical shock and hazardous energy levels, do not exceed the level of repair specified in these procedures. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs could create conditions that are hazardous.



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

- If the system has multiple power supplies, disconnect power from the system by unplugging all power cords from the power supplies.
 - Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
 - Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
-



CAUTION: To properly ventilate your system, you must provide at least 12 inches (30.5 cm) of clearance at the front and back of the computer.



CAUTION: The computer is designed to be electrically grounded. To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

Where to Go for Additional Help

In addition to this guide, the following information sources are available:

- User Documentation
- *Compaq Service Quick Reference Guide*
- Service Training Guides
- Compaq Service Advisories and Bulletins
- Compaq QuickFind
- Compaq Insight Manager
- Compaq Download Facility: Call 1-281-518-1418

Integrated Management Display

Some Compaq server models include a Compaq Integrated Management Display (IMD), an integrated, 16x4 character display mounted on the front of the server. This display provides easy-to-use menu-driven access to server information, including model number, LCD firmware revision, and POST operations.

Telephone Numbers

For the name of your nearest Compaq Authorized Reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868

For Compaq technical support:

- In the United States and Canada, call 1-800-386-2172

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

System Description

Introduction

The *Compaq StorageWorks SSL2000 Series* is a tape library system that combines Advanced Intelligent Tape™ (AIT) drive technology with advanced robotics. Designed for high duty-cycle online and near-online applications, such as hierarchical storage management, it is a superior performer in high-volume backup and archival service.

A Compaq StorageWorks SSL2000 Series Library (AIT Library) can be equipped with one or two tape drives and a 20-slot tape cartridge magazine that includes one mail slot.

This chapter includes descriptions for:

- Library models
- Multi-unit Library systems
- Tape cartridge mail slot
- SCSI interface and bus performance considerations
- Shuttle lockdown mechanism
- Library features
- Advanced design features

Library Models

Libraries are currently available with:

- A tabletop or rackmount version
- One or two tape drives
- An optional Pass-Through Mechanism (PTM) for connecting up to five library units
- AIT 2 technology
- A Fast/Wide, Low Voltage Differential (LVD)/Single Ended (SE) SCSI-2 interface

The drives used in the Library read from and write to 8 mm AIT 2 data tape cartridges with a native capacity of 35 GB or 50 GB (see Table 1-1).

Table 1-1
Library Models

| Model Number | Configuration |
|--------------|---|
| 175195-B21 | 1 Drive, AIT 2 50 GB, tabletop, LVD/SE |
| 175195-B22 | 2 Drive, AIT 2 50 GB, tabletop, LVD/SE |
| 175196-B21 | 1 Drive, AIT 2 50 GB, rackmount, LVD/SE |
| 175196-B22 | 2 Drive, AIT 2 50 GB, rackmount, LVD/SE |

Multi-Unit Library Systems

The Library features SmartScale Storage™, an architecture that lets you combine multiple units into an integrated library system. This architecture enables the robotics in each of the Library units to exchange cartridges by means of a vertical PTM. Under the control of the unit you configure to be the master unit, the PTM integrates the robotics in the individual slave units into a single high-performance library robotics system. For more information, see Appendix C, “Installation.”

The SmartScale Storage architecture gives you a truly scaleable library that can smoothly expand to meet your growing storage needs. You can start with a system configured to your present requirements, confident that as your storage needs evolve, adding units and extending the PTM can easily modify the Library. Add drives for faster performance or magazine space for greater capacity, as needed. Then just turn on the power, and immediately the system updates the system map so the host is informed of the expanded capability. The SmartScale Storage architecture has built-in redundancy so that if the master unit fails, a slave unit (slave 0) can be configured to take over as the master unit. This is done without having to make hardware changes except moving the motor cable to the new master.

Tape Cartridge Magazine Mail Slot

If your host software permits, you can use the front slot in the tape cartridge magazine (the first slot you see when you open the door) as a mail slot for inserting or removing a single cartridge without interrupting host operations in progress. The mail slot is implemented as the SCSI IMPORT/EXPORT commands.

SCSI Interface

The unit presents the following to the host:

- A single SCSI medium changer device with a single SCSI medium transport element
- A number of SCSI storage elements equal to the total number of cartridge magazine slots
- A single SCSI import/export element
- A number of SCSI data transfer elements equal to the total number of drives in the Library

Multi-Server Data Sharing

A host computer with a SCSI controller connected to a bus is a SCSI initiator. The Library is a SCSI target. SCSI rules permit multiple initiators on a single bus. Therefore, with the proper host software, it is possible to connect multiple hosts to a single Library over a single SCSI bus. This allows multiple hosts to operate the library robotics, loading and unloading cartridges as each host requires.

In a library system with many drives, it might be desirable to use multiple SCSI buses for the drives so the data transfer rate of the drives is not limited by bus bandwidth. Individual drives can be connected to separate hosts. Using special software, one of the hosts can act as a master server, processing all robotics commands and permitting several hosts to share a common database.

SCSI Configuration

The Library standard SCSI interface is a Fast/Wide LVD/SE using high-density, 68-pin D-series connectors. For more information, see Appendix C, "Installation."

SCSI Bus Performance Considerations

Drives

With a standard Fast/Wide SCSI interface, each drive offers a sustained native data transfer rate of 6 MB/s. In a two-drive unit, the total native rate is twice these rates. The rates for compressed data are the native rates multiplied by the compression factor, which depends on file content, but averages approximately 2:1.

Data Transfer Rate

The data transfer rate of the Library depends on the type of the AIT drive, number of drives, and the number of drives connected to the SCSI bus. The library robotics imposes minimal loading on the bus.

| | | |
|-------|-----------|---|
| AIT-2 | Fast/Wide | @ 40 MB/s (burst) |
| AIT-2 | Sustained | @ 6 MB/s (native) @ 12 MB/s (compressed) |

Each drive has a maximum sustained rate of 12 MB/s with compressed data. As a result, the transfer rate of a two-drive unit occupies the full bandwidth of the bus. Sharing a SCSI bus among more than two drives degrades the maximum performance of the library system.

Internal Cabling Configuration

Each SCSI bus in the Library is wired separately. The library robotics and drive 1 share one bus; add-on drives are connected to separate SCSI buses. SCSI jumper cables are available to allow the drives and robotics of a unit to be daisy-chained to a single SCSI bus. For more detailed information, see Appendix C, "Installation."

Bus Length Limitations

A single-ended Fast/Wide SCSI bus is limited in length to 10 ft (3 m), including cabling within the units. A differential Fast/Wide SCSI bus can be up to 82 ft (25 m) in length, including cabling within the units. If all devices and host adapter are LVD, length is limited to 39 ft (12 m).

Independent SCSI Buses for SE

For those two-drive applications where both AIT drives run in SCSI SE mode (rather than LVD mode), each drive must be connected to its own SCSI bus.

Physical Configuration

The Library is configured as a tabletop model. To convert a tabletop Library to a rackmounted model, order the Compaq Conversion Kit Part Number 175199-B21.

Shuttle Lockdown Mechanism

Compaq has installed a shuttle lockdown mechanism as a precautionary safety mechanism to prevent damage to the Library during shipment from the factory. The mechanism is a spring-loaded screw in the back of the Library that secures the shuttle to a bracket.

NOTE: You must release the shuttle lockdown mechanism before powering up the unit or it will not operate. See Appendix C, "Installation," for more information.

Library Features

Figures 1-1 through 1-3 shows some of the external features of the Library.

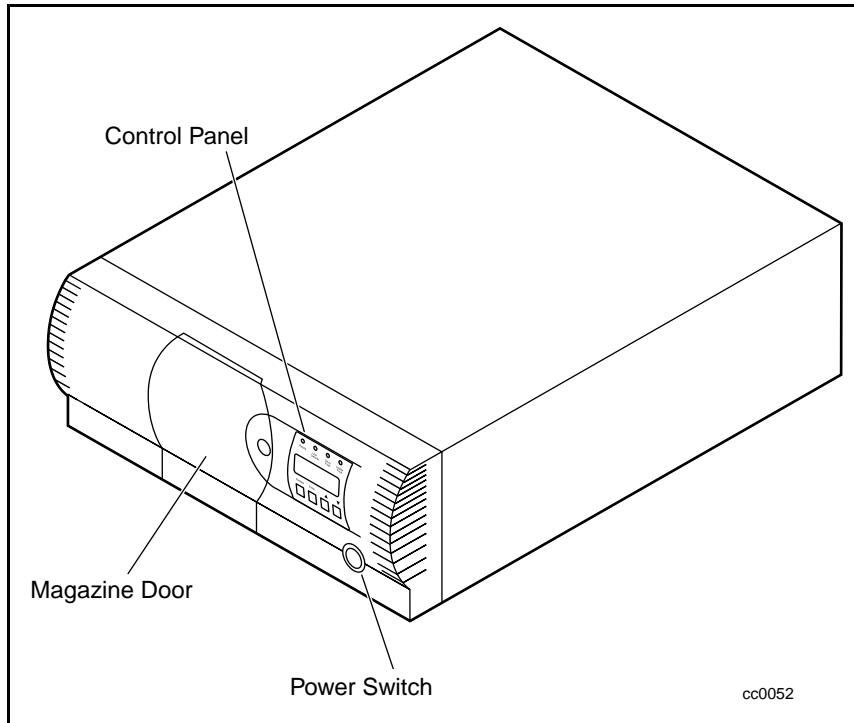


Figure 1-1. Library front view

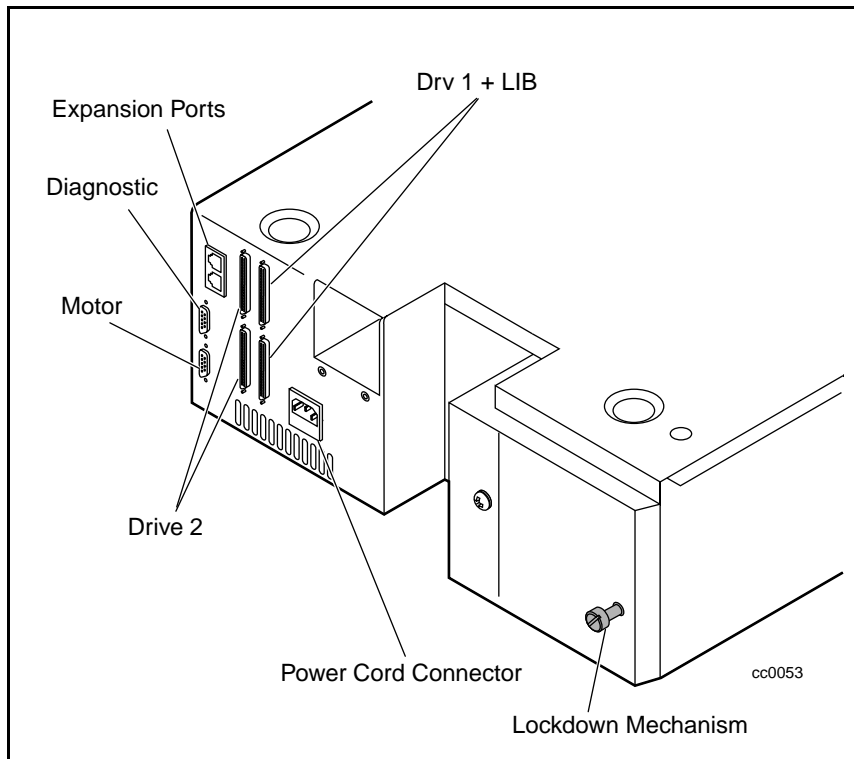


Figure 1-2. Library rear view

Control Panel

The control panel features a 4-line by 20-character backlit liquid crystal display, four LED indicators and four buttons. The buttons let you navigate through the menu structure to select and display operating modes, device status, diagnostic and maintenance functions, device history and error statistics, and library system configuration.

Display

The backlit, 4-line by 20-character control panel display provides a highly intelligible presentation of drive and loader status, menu choices, and error messages. The scrolling feature greatly expands the amount of information available to the operator.

Power Supply

The AC power switch is located on the front panel of the unit. The autoranging power supply adjusts automatically to either of two operating voltage ranges. The ranges are 100-120 VAC and 220-240 VAC. The power supply is capable of operating at 47 or 63 Hz without any adjustment or modification. AC power is supplied to the power supply by a single IEC-compatible socket, which can be connected to any properly grounded outlet.

Tape Cartridge Magazine

The polymer magazine fits into an extruded track, which assures precise positioning for the library robotics (see Figure 1-3).

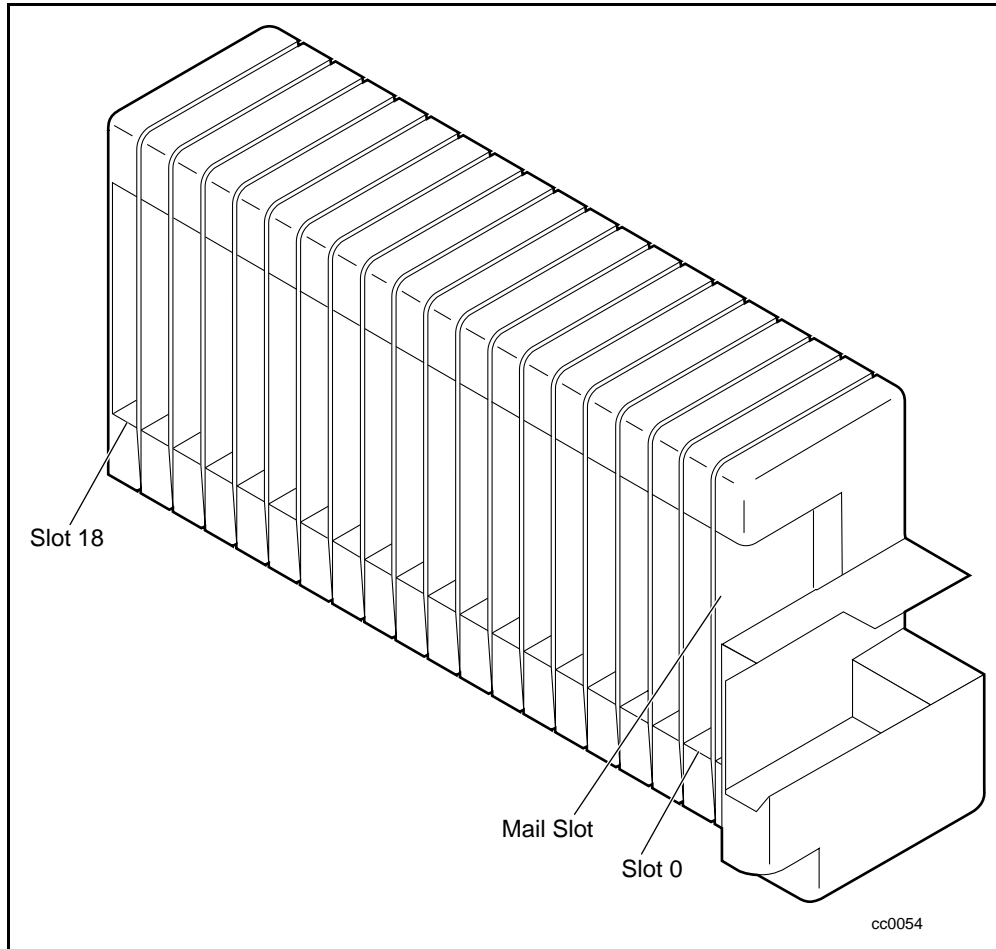


Figure 1-3. Tape cartridge magazine

The front slot in the magazine is a Mail Slot, used to add or remove cartridges without interrupting library operation. You can remove the magazine through the front door, but it is protected from tampering in either of two ways:

- An electronic combination lock, operated from the control panel
- The host issuing a SCSI PREVENT/ALLOW MEDIUM REMOVAL command

For more information on inserting and removing the magazine, see Chapter 2, “Operation.”

Integral Fan Cooling

Each AIT drive contains a thermostat-controlled fan. In addition, a fan is mounted inside the Library to prevent critical parts from overheating.

Robotics

The Library features Compaq Mainframe-Class™ Library Robotics. These advanced robotics can load any of the cartridges stored in the magazine into any of the tape drives.

Bar Code Reader

A standard bar code reader is mounted on the cartridge shuttle. It reads bar code labels attached to each cartridge, and maintains the bar code data in memory as part of the library system map.

Advanced Design Features

Embedded Diagnostics

The Library provides three levels of embedded diagnostics:

Power-On Self Test (POST) — Performs various verification tests on the system's configuration, host interface and device control functions, as well as memory tests when you power on the unit.

User Diagnostics — Lets you display and change configuration options. Selected from front panel.

CE Diagnostics — Advanced diagnostics used by Customer Engineers (CEs) for servicing the Library. Selected from front panel.

For more information on user diagnostics, see Appendix C, "Installation."

Error Checking

The drives used in the Library use read while write data checking and error-correction code (ECC) technology such as is used in audio CD, DVD, and laser discs.

Buffer

Drives are equipped with an 8-MB buffer.

Compression

All drives used in the Library use the Adaptive Lossless Data Compression (ALDC data compression algorithm developed by IBM).

Capacity

The Library with its 20-cartridge magazine offers the formatted capacities listed in Table 1-5.

NOTE: Capacities are based on 19 storage slots.

**Table 1-2
Tape Capacities**

| Native Capacity Per Cartridge | Per Cartridge Compressed (2:1) | Full Magazine Compressed (2:1) |
|-------------------------------|--------------------------------|--------------------------------|
| 35 GB | 70 GB | 1,330 GB (665 native) |
| 50 GB | 100 GB | 1,900 GB (950 native) |

Media Life

The media manufacturer rates the media used in the Library at over 30,000 end-to-end passes and specifies a shelf life of at least 30 years.

Chapter 2

Operation

Introduction

This chapter describes operating the Compaq StorageWorks SSL2000 Series Library (AIT Library) through the control panel at the front of the unit.

This chapter includes descriptions and or procedures for:

- Front panel
- LED indicators and buttons
- Front panel and media locks
- Startup display messages
- Using Library menus and modes
- Displaying firmware revisions
- Inserting and removing cartridges
- Tape cartridge requirements
- Bar code labels

Front Panel

The front panel of the Library includes a power switch for the unit and the control panel, which has buttons, a display, and indicators (see Figure 2-1).

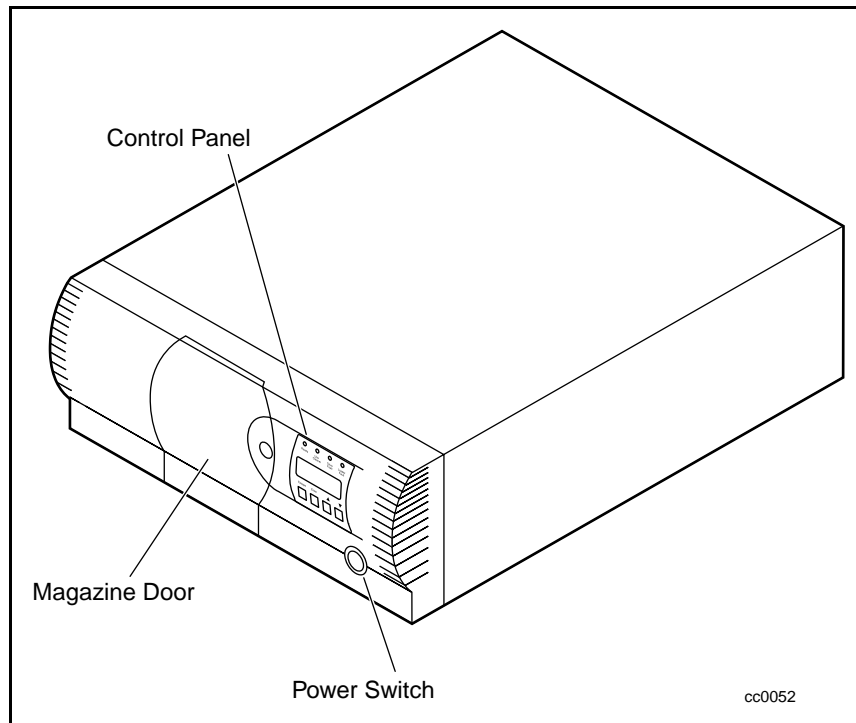


Figure 2-1. Library front panel

Power Switch

The power switch controls the supply of AC power to the Library front panel. It is a push-on, push-off switch. When the power is on, the backplane of the control panel display lights.

Indicators and Buttons

The control panel consists of four LED indicators, a four-line by 20-character backlit LCD display, and four buttons (see Figure 2-2).

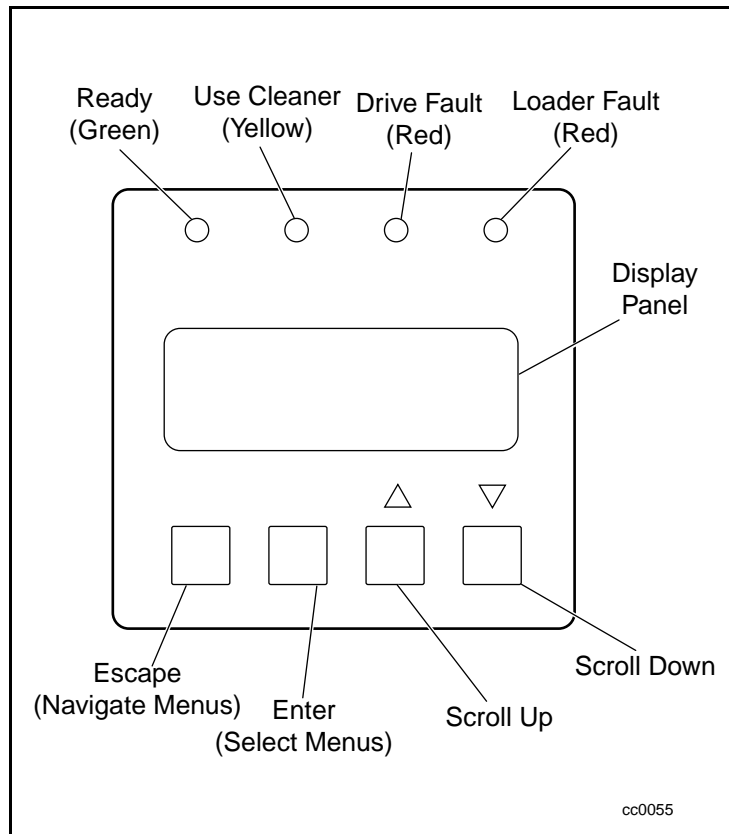


Figure 2-2. Library control panel

LED Indicators

There are four LED indicators on the control panel, labeled Ready (green), Use Cleaner (yellow), Drive Fault (red), and Loader Fault (red).

The Ready LED (green) lights when the Library is ready to accept commands from the host computer. The Ready LED goes out when you enter the Menu mode, indicating that the Library is offline.

The Use Cleaner LED (yellow) indicates that one or more of the drives in the Library needs cleaning. Perform a cleaning operation as described in Chapter 5, "Maintenance." When the Use Cleaner LED lights, you can find out which drive needs cleaning by selecting Cleaning Needed on the Drive Status submenu.

When either the Drive Fault or the Loader Fault LED (red) lights, a Fault screen appears on the LCD display. The Fault screen is described later in this chapter.

See Chapter 4, "Troubleshooting," for a list of Fault Symptom Codes (FSC) and Error Recovery Procedures (ERP).

Buttons

There are four buttons on the control panel: **Escape**, **Enter**, **▲**, and **▼**. The buttons do not directly control specific functions or options. Instead, you use the buttons to navigate from the Default screen through a multi-level menu structure, then select the desired option from the appropriate menu using the **Enter** button. Table 2-1 lists the effect of each of the four buttons under various conditions.

Using the Enter Button to Access Main Menu

To enter the Menu mode and display the Main menu from the Default screen, press the **Enter** button. When you enter the Menu mode, the Ready LED goes out. This means that the Library is offline, and the Library responds to all commands from the host with a SCSI Not Ready until you exit the Menu mode and the Ready LED lights.

Using the Escape Button to Return to Default Screen

To return to the Main menu from a submenu, press the **Escape** button repeatedly until the Main menu appears. Pressing the **Escape** button while the Main menu is displayed exits the Menu mode and returns you to the Default screen.

Using the Escape Button to Access Status Mode

To enter the Status Mode, which displays all aspects of the Library's operating and configuration status, press the **Escape** button at the Default screen. The Library remains online.

Table 2-1
Control Panel Button Functions

| Display/Mode | Escape | Enter | ▲ | ▼ |
|-------------------------------|--|------------------------------------|---|--|
| At POST Screen | N/A | N/A | | N/A |
| At Default Screen | Enters Status Mode | Enters Menu Mode | Toggles between Page 1 and Page 2 | |
| In Status Mode (while online) | Returns to Default Screen | Same as in Menu Mode | Same as in Menu Mode | |
| In Menu Mode | Rejects Currently Displayed Choice, or Aborts Control Panel Operation In Progress, or Exits to Next Higher Menu Level, or Exits Menu Mode to Default Screen | Accepts Currently Displayed Choice | Moves ► 1 Line Upward Through List of Options, or Scrolls Part of Display 1 Line Toward Top of List of Options | Moves ► 1 Line Downward Through List of Options, or Scrolls Part of Display 1 Line Toward Bottom of List of Options |
| At Fault Screen | N/A | Clears Soft Errors | N/A | N/A |

NOTE: There is an auto-repeat feature for the ▲ and ▼ buttons. When you press either button for more than one-half second, the control panel behaves as if you were pressing and releasing the button about four times per second. This effect stops when you release the button.

Front Panel and Media Locks

A security feature is available to avoid accidental interruption of Library operation by entering the Menu mode or removing cartridges while the host is accessing the Library. The front panel and the media can be electronically locked. When the front panel is locked, you can only enter the Menu mode after entering a 4-digit code. That is, when the Default screen appears, pressing the **Enter** button does not invoke the Menu mode until you enter the code. The front panel cannot be unlocked without using the Security submenu to unlock it.

The media can also be locked by software running on the host, using the SCSI ALLOW/PREVENT MEDIUM REMOVAL command. The Library provides no control panel override for this command. Usually, exiting the host software restores media access. In the event of host failure, you can restore media access by cycling the Library power.

Procedures for locking and unlocking front panels and media are described later in this chapter.

Startup Display Messages

The display on the control panel is capable of displaying four lines of 20 characters each, to allow the use of easy-to-understand messages. Many of these messages and their functions are described in this chapter. Those displays that are described in other chapters are cross-referenced here as well.

Power-On Self Test Screen

When power is first applied to the module, a series of Power-On Self Test (POST) diagnostics are performed. During POST execution, the model number of the module, the firmware revision, and the status or result of the test in progress are displayed on the control panel as shown:

```
Compaq SSL2020TL  
Firmware Level  0X.XX  
Checking Hardware
```

Initialization Screens

After the POST completes, the library robotics are initialized. A series of screens similar to the one shown is displayed during this process.

```
Compaq SSL2020TL  
Firmware Level  0X.XX  
Initializing Loader
```

Default Screen

After the POST diagnostics have concluded successfully and initialization is complete, the following Default screen appears. Note that the Default screen consists of two pages.

Page 1 Default screen:

Loader Idle
 Drv0: Ready or No Tape
 Drv1: Idle

Page 2 Default screen:

Loader Idle

```

0 ▶ □ □ _ _ _ _ _ _ _ _ □ ◀ 9
10 ▶ □ □ _ _ _ _ _ _ _ _ □ ◀ 18 ◀
```

Page 1 displays the library and drive status. Page 2 displays the library status (Line 1) and magazine slot status (Lines 3 and 4).

The library status lines show each slot as a rectangle. A solid block indicates that a cartridge is present. A hollow block indicates that a slot is empty.

Line 4 also shows the status of the mail slot. A ◀ symbol indicates that a cartridge is in the mail slot. A ◀ symbol indicates that the mail slot is empty.

The ▲, and ▼ buttons control which Default page is displayed.

Fault Screen

When a fault is detected, a screen similar to the one shown appears. In addition, either the Drive Fault or the Loader Fault LED on the control panel lights.

```

Fault Code:      3004
Elevator Jammed
Power Down to Clear
```

The first line shows a numerical FSC. The second line shows a brief description of the error. The third and fourth lines contain a one- or two-line message describing the initial ERP.

For a list of FSCs and ERPs, see Chapter 4, “Troubleshooting.”

Using the Library Menus

Use the Library menus (Figure 2-3) to display status information and to operate and configure the Library.

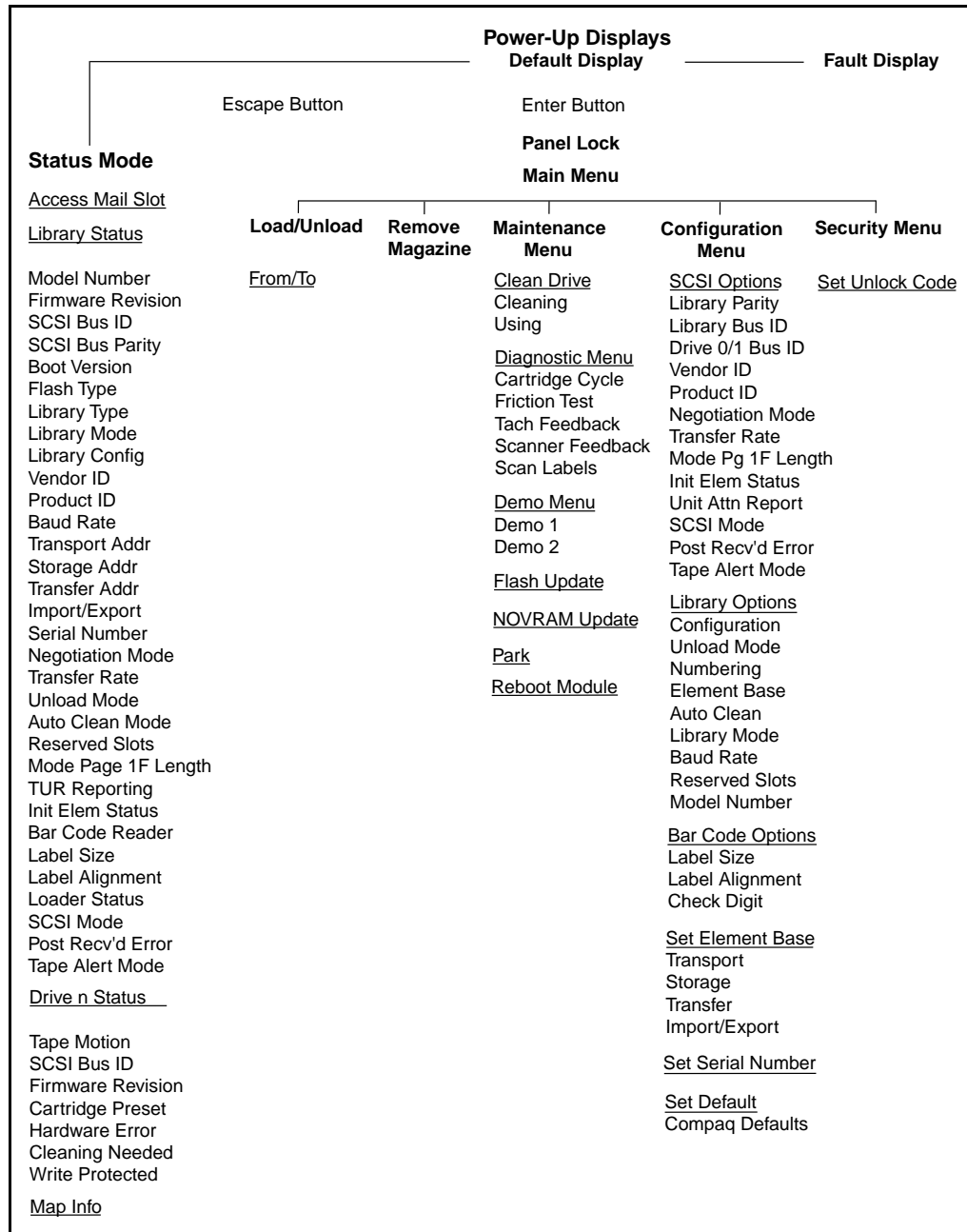


Figure 2-3. Library menus

Using the Status Mode

You can enter the Status Mode by pressing the **Escape** button whenever the Default screen appears. Entering the Status Mode does not affect operation of the Library. When you enter the Status Mode, the following appears:

```
▶ Access Mail Slot
  Library Status
  Drive 0 Status
  Map Info          ↓
```

Exiting the Status Mode

To exit the Status Mode, press the **Escape** button until the Status menu appears. Press the **Escape** button again to display the Default screen.

Exploring the Status Mode

The functions available in the Status Mode are:

- Access Mail Slot
- Library Status
- Drive *n* Status
- Map Info

Scroll up or down with the ▲ and ▼ buttons and press the **Enter** button to select the item.

Library Status Submenu

When you select Library Status, the following menu appears:

```
Model Number:
  Compaq SSL2020TL
Firmware Revision:
  03.03          ↓
```

Scroll through this screen to view the list of available options:

- Model Number
- Firmware Revision
- SCSI Bus ID
- SCSI Bus Parity
- Boot Version
- Flash Type
- Library Mode
- Library Config
- Vendor Iden
- Product Iden
- Baud Rate
- Transport Address
- Storage Address
- Transfer Address
- Import/Export Addr
- Serial Number
- Negotiation Mode
- Transfer Rate
- Unload Mode
- Auto Clean Mode
- Reserved Slots
- Mode Page 1F Length
- TUR Reporting
- Initialize Element Status
- Barcode Reader
- Label Size
- Label Alignment
- Loader Status
- SCSI Mode
- Post Recv'd Error
- Tape Alert Mode

Drive Status Menu

When you select either of the drives, the following menu appears:

```
▶ Tape Motion:
  Idle
  SCSI Bus ID:
  4
```

↓

Scroll through this screen to view the list of available options:

- Tape Motion
- SCSI Bus ID
- Firmware Revision
- Cartridge Present
- Hardware Error
- Cleaning Needed
- Write Protected

Map Information Screen

When you select Map Info, the following screen appears. The location being reported appears on Line 1. The content of the bar code on the label, up to 6 characters, appears on Line 4.

```

Drv 0
Occupied
Label Valid
XXXXXXXX      ↓

```

The list of locations available for display on line 1 is as follows. If you do not designate any mail slots, those lines are omitted from the list.

- Drive0
- Drive1
- Slot0
- Slot1
- . . .
- Slot18
- Mail Slot

Depending on the report for each location, Line 2 might display either Empty or Occupied, or, if a magazine is absent, Not Installed. Depending on the report for each location, Line 3 might display either Label Valid, or Label Not Present.

For each location reported, Line 4 displays the actual bar code on the label, up to 6 characters.

Using the Menu Mode

NOTE: When the Library enters the Menu mode, the Ready LED goes out. This means that the module is offline, and responds to all commands from the host with a SCSI Not Ready until you exit the Menu Mode and the Ready LED comes on.

To prevent interruption of host operations, you can lock out the Menu Mode using the Security menu. See “Security Menu” later in this chapter. When all control panels are locked, you must enter your unlock code to display the Main menu.

When the Default screen appears, you can enter the Menu Mode by pressing the **Enter** button. The following Main menu appears:

```

▶ Load/Unload
  Remove Magazine
  Maintenance Menu
  Configure Menu      ↓

```

NOTE: If the control panel has been locked, the following screen appears instead of the one shown above. You must know the unlock code for the Library before you can continue.

Front Panel Locked

ENTER to Unlock
ESCAPE to Exit

Maintenance Menu

The Maintenance menu options, intended for operator use, are described in Chapter 3, “Maintenance.”

Configure Menu

The Configure menu, how to use it, and the options available under it are described in Appendix C, “Installation.”

Security Menu

Use the Security menu to lock the control panel. This prevents inadvertent or unauthorized access to the Menu Mode, which takes the Library offline.

NOTE: You can display the Show Status menu without unlocking the panel (and without taking the Library offline) by pressing the **Escape** button at the Default screen.

When you select the Security menu, the following screen appears:

- ▶ Set Unlock Code
- Set Mail Slot Code

The Security Menu includes the following options:

- Set Unlock Code
- Set Mail Slot Code

To change the unlock code, or to enable or disable the panel locking function, scroll downward to Set Unlock Code. Press the **Enter** button. The following screen appears:

```

Unlock Code          ↑
  *0000*

0000 Disables Lock  ↓
  
```

An underline cursor displays under the first digit. To set the first digit, press the ▲ button or the ▼ button until the number you want appears. To move the cursor to the second digit, press the **Enter** button. Repeat the process for each of the four digits. Be sure to remember the 4-digit number; you use it to enter the Menu Mode. Use an unlock code of 0000 to disable control panel locking.

When you have finished entering four digits, press the **Escape** button. The following screen appears. Your code appears instead of XXXX.

```

Unlock Code          ↑
  *XXXX*
ENTER to Accept
ESCAPE to Exit      ↓
  
```

Press the **Enter** button to accept the displayed unlock code or **Escape** to return to the Main menu.

The next time you try to enter the Menu Mode, the following screen appears. You can still display the Status menu without using the security code by pressing the **Escape** button at the Default screen.

Front Panel Locked

ENTER to Unlock
ESCAPE to Exit

When you press the **Enter** button, the following screen appears:

```

Unlock Code          ↑
"                   "
                    ↓
    
```

Using the ▲ and ▼ buttons, set the first digit of the unlock code. Press the **Enter** button to move the cursor to the second digit and repeat the process. When you have finished, press the **Escape** button. The following screen appears:

```

Unlock Code
*"XXXX"
ENTER to Validate
ESCAPE to Exit
    
```

Press the **Enter** button to validate your choice. If the code is correct, the Main menu appears. If the code is incorrect, an error screen appears. If you forgot your unlock code, contact your Technical Support representative for assistance.

Displaying Firmware Revisions

You can display the library robotics firmware revision at any time by pressing the **Escape** button at the Default screen to enter the Status Mode. It displays as one of the options on the Library Status submenu of the Status menu. It is also displayed on line 2 of the POST Screen and the Initialization Screens.

Loading and Unloading

The Load/Unload menus let you specify a source and a destination for a cartridge movement, so you use exactly the same procedure to load and unload. To load or unload a tape from the front panel, use the Load/Unload menus as follows:

```

Ready
0 ▶ □ □ _ _ _ _ _ □ ◀ 9
10 ▶ □ □ _ _ _ _ _ □ ◀ 18 ◀
    
```

From the Default screen, enter the Menu Mode by pressing the **Enter** button. The following Main menu appears with the ► next to Load/Unload.

```

► Load/Unload
  Remove Magazine
  Maintenance Menu
  Configure Menu    ↓

```

Press **Enter** to display the first Load/Unload submenu, as shown.

```

From:
► *Slot 1
  To
  *Drv0          ↓

```

The ► is next to line 2 of the display. Line 2 shows the top item in a scrollable list of sources. Note that a ↓ has appeared on the right of the bottom line. This indicates that the ▼ button can now be used to scroll through the list, and that the top item on the list is displayed. As soon as you press the ▼ button, the following three things happen:

1. The list scrolls down one item (only line 2 scrolls).
2. An ↑ displays on the right of line 1, meaning there are more options above the item displayed on line 2.
3. The * at the left of line 2 (the current selection) disappears, meaning you have not selected an item from the list.

NOTE: The contents of the lists on line 2 and line 4 vary as follows.

Initial Screen - From Line

The list on line 2 (the From line) includes every drive and magazine slot (including mail slots) with cartridges. (You cannot retrieve a cartridge from an empty slot or drive.)

Initial Screen - To Line

The list on line 4 (the To line) includes all the valid destination choices, that is, drives and slots that are empty. (You can't put a cartridge into a full slot or drive.)

Scroll List - To Line

There is another limitation on the To list. If you select a drive on the From screen, the To list can include only slots. If you select a slot on the From screen, the To list can contain only drives.

For example, load the cartridge that is in Slot 11 into any available drive. Use the ▼ button to scroll line two to Slot 11. The following screen appears:

```

From:          ↑
► Slot 11
To:
  Drv 0

```

When you scroll to your desired source, press the **Enter** button to select it. Two changes occur in the display as shown below:

- The * reappears at the beginning of line 2, indicating that you have made a selection.
- The ► moves to line 4, indicating that you can select a destination.

```
From:
  *Slot 11
To:
  ► *Drv 0
```

Press the **Enter** button to select Drive 1 as the destination. The following Confirmation Screen appears:

```
From:      Slot 11  To: Drv 0

ENTER to Execute
ESCAPE to Cancel
```

Press the **Enter** button to execute the load or unload or the **Escape** button to cancel or return to the From entry screen.

When you press the **Enter** button, the following screen appears: If the source is a drive, the word Unload appears in place of the word Load on line 4.

```
From:      Slot 11  To: Drv 0

Load In Progress
```

When the load or unload operation completes, the Default screen reappears.

Inserting and Removing Cartridges

The tape magazine must be removed from the Library in order to remove or insert cartridges (see Figure 2-4). Make sure the slot you want to use is not already reserved for a cartridge that is now in a drive. The safest way to do this is to unload all drives before removing the magazine. You can unload all the drives either through your host computer software or by using the LOAD/UNLOAD command on the Main menu.

Make sure the control panel is unlocked. When the control panel is locked, it is impossible to enter the Menu Mode. The host computer must allow removal of the magazine. The host software can enable or disable the door unlock function using the SCSI PREVENT/ALLOW MEDIUM REMOVAL command. If the host is preventing removal, when you select Unlock Door on the Main menu and press the **Enter** button, the message Magazine Locked appears.

The host software should be able to release the magazine without shutting down. If host computer failure prevents the host from releasing the lock, cycle power to the Library.

IMPORTANT: If you are still unable to open the magazine door, see "Emergency Magazine Removal," later in this chapter.

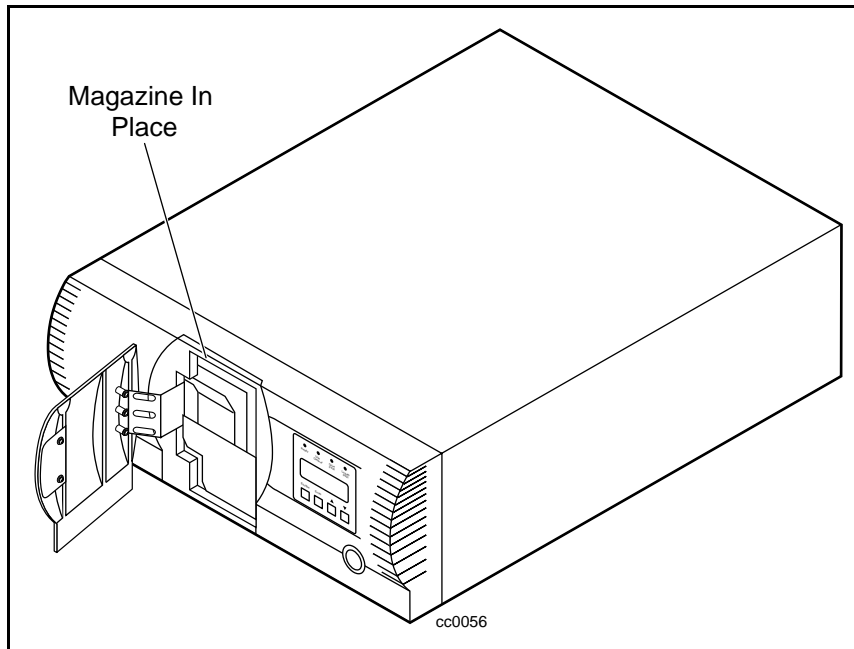


Figure 2-4. Magazine in place

Removing the Magazine

Whenever a magazine is installed inside the module it is locked in place to prevent tampering or accidental removal. To remove the magazine, enter the Menu Mode by pressing the **Enter** button at the Default screen. At the Main menu, select Remove Magazine, and press the **Enter** button. The magazine door swings open.

Emergency Magazine Removal

If a fault occurs that prevents removal of the magazine, turn the power off for five seconds. Power up while continuously pressing the **▲** button. Continue to hold the button until all of the indicators on the control panel light, then go out. Release the button. The door swings open.

Inserting Cartridges into the Magazine

A full magazine is shown in Figure 2-5. Insert cartridges so that the label end with the write protect switch is outward, with the write protect switch toward the bottom of the magazine. The lowest numbered cartridge slot in the magazine is closest to the handle. The highest numbered cartridge slot is the farthest from the handle.

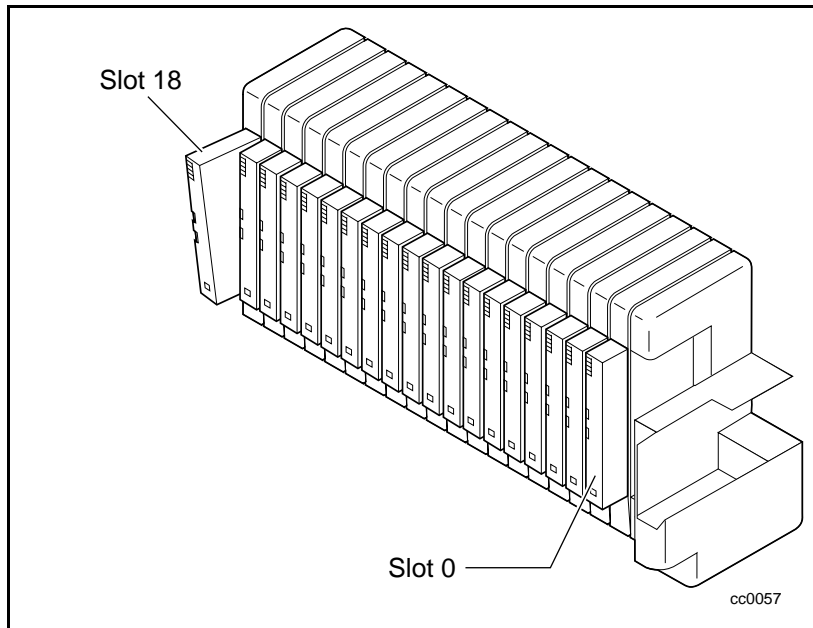


Figure 2-5. Tape magazine with cartridges installed

Inserting the Magazine

If the magazine door on the front of the Library is closed and locked, open it, as follows. Enter the Menu Mode by pressing the **Enter** button at the Default screen. At the Main menu, select Remove Magazine and press the **Enter** button. The magazine door swings open. Slide the magazine through the door opening, with the cartridges protruding from the left. When the magazine is fully inserted, push the door closed until it locks.

Using the Mail Slot

The mail slot is used only with host software that supports this feature (Figure 2-6). To access the mail slot from the Default screen, press the **Escape** button to enter the Status Mode. Press the **Enter** button and the magazine door opens, exposing the Mail Slot. The magazine remains locked inside the module. The mail slot of the magazine can be tilted forward to insert or remove a cartridge. After inserting or removing the cartridge, close the magazine door.

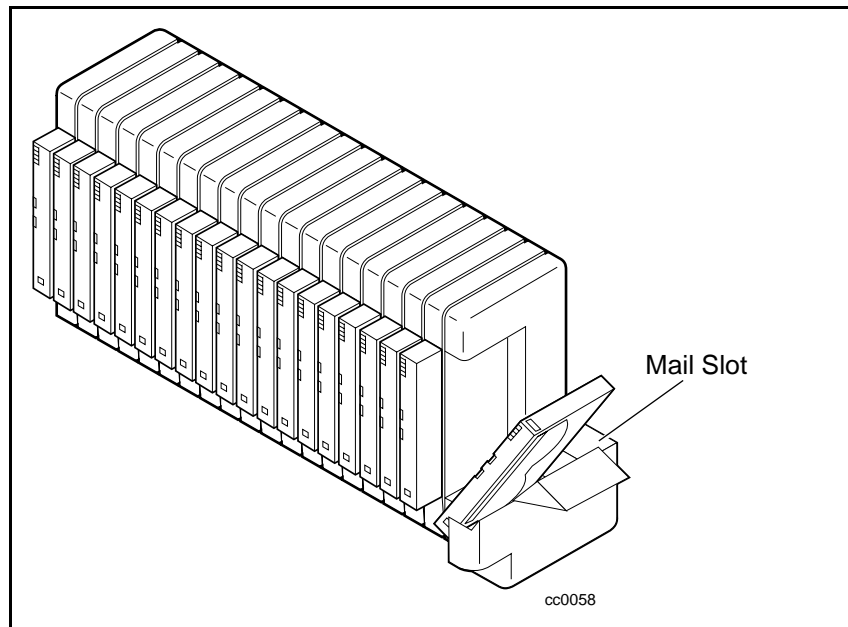


Figure 2-6. Mail slot location

Tape Cartridge Requirements

The Library uses Advanced Intelligent Tape (AIT) 8 mm tape cartridges. They are designed for an MTBF of 250,000 hours.

NOTE: Handle and store tape cartridges in a clean, dust-free environment.

Write Protecting Cartridges

To write protect a tape cartridge (disable data recording), slide the write protect switch up so that no orange color is visible in the lower small window (see Figure 2-7). To enable data recording, slide the write protect switch down until the orange indicator shows in both small windows.

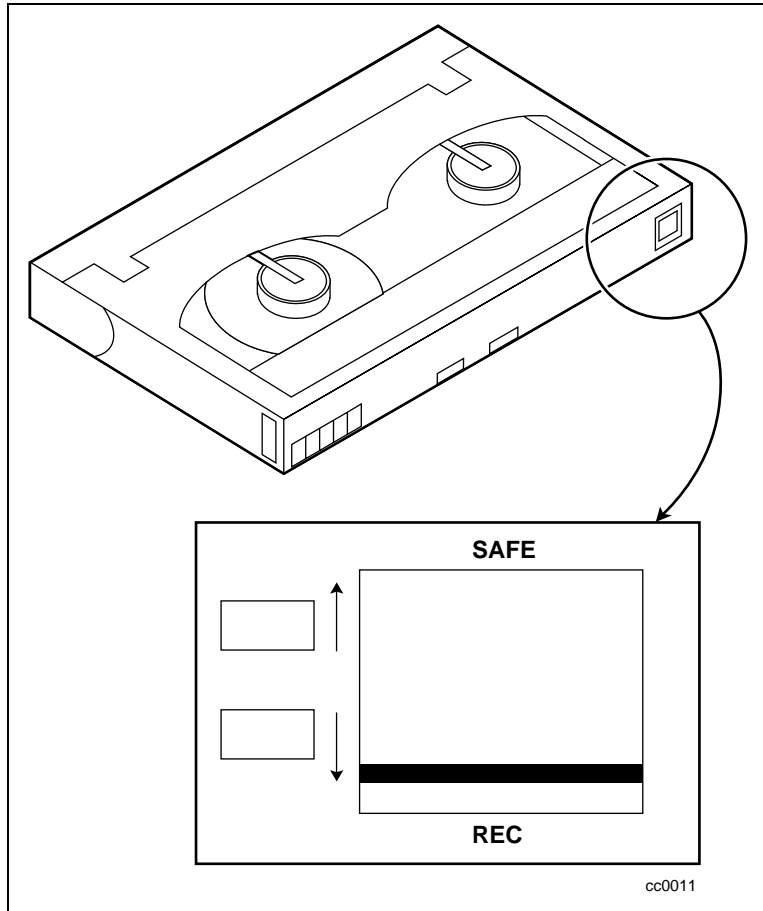


Figure 2-7. Tape cartridge write protection switch

Bar Code Labels

Bar code labels should meet the following specifications (see Figure 2-8):

- Size: 2.1 in x 0.4 in (55 mm x 10.2 mm)
- Stock: Label stock with adhesive back and matte overlamine
- Location: Mounts next to write-protect switch on cartridge
- Text: Six characters, any combination of alphabetic and numeric
- Bar Code: Code 39, Codabar, 3-of-9, standard 2-of-5, or interleaved 2-of-5, with a length of eight digits. Minimum element width is 0.3 in (7.5 mm)

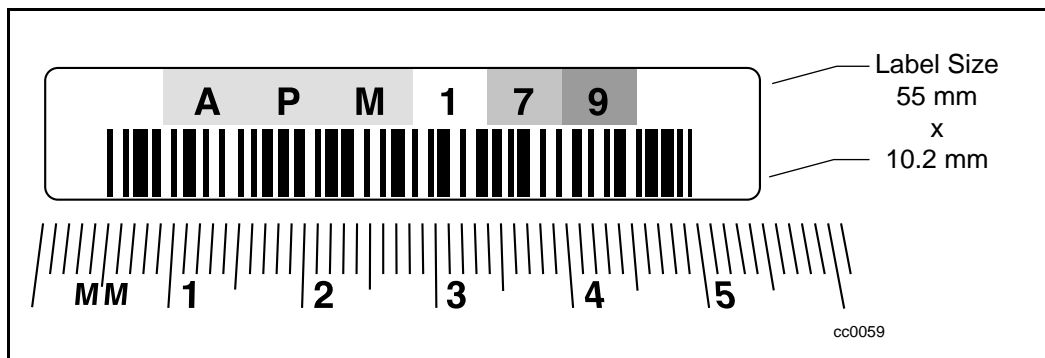


Figure 2-8. Bar code label size

Multi-Unit Library System Operation

Powering Up

All Library units should be powered up at the same time through the storage cabinet supplied power, or the master unit (top) should be powered up last if the Library units are powered up individually.

Connecting a Multi-Unit Library System

The following procedure explains how to set the SCSI ID and SCSI host connections:

1. For maximum performance, connect only 2 AIT-2 drives to each SCSI host adapter.
2. For nominal performance, you can connect 3 AIT-2 drives per host.
3. Set the SCSI IDs through the master unit front panel dependent on the SCSI host adapter drive ratio.
4. On the master unit, the Library will take up a SCSI ID (default is 0).
5. AIT drives on different SCSI host adapters can have the same ID.

NOTE: If you use only two drives per SCSI host adapter, leaving the default setting will work provided there is no conflict with any other devices.

Chapter 3

Maintenance

Introduction

This chapter describes the Clean Drive and Demo options contained in the Maintenance menu. Use the Clean Drive option to clean tape drives installed in the Compaq StorageWorks SSL2000 Series Library (AIT Library). Use the Demo option to fully exercise the Library robotics.

IMPORTANT: Perform the Clean Drive option from the Maintenance menu only when the Library displays a message informing you that a drive needs cleaning.

NOTE: When Compaq introduces new Library firmware, a qualified service technician must install it.

This chapter includes procedures for:

- Running a cleaning cartridge
- Removing the cleaning cartridge
- Exercising the Library robotics

Running a Cleaning Cartridge

There are two ways to run a cleaning cartridge:

- *Automatically*—by enabling the Auto Clean option
- *Manually*—by selecting the CLEAN DRIVE command from the Maintenance submenu on the front panel display

Running a Cleaning Cartridge Automatically

You can configure the Library so that it runs the cleaning cartridge automatically. Because the cleaning cartridge is abrasive, you should not use it unless Use Cleaner appears on the control panel screen. The completion of an unload operation on a drive that needs cleaning causes the Use Cleaner LED to light. This in turn activates an automatic cleaning cycle if Auto Clean has been selected from the Configuration menu.

To run a cleaning cartridge automatically using Auto Clean:

1. Reserve a slot as the cleaning slot:

See “Setting Up Reserved Slots” in Appendix C.

If you have more than one reserved slot, the Cleaning Slot is the first reserved slot. Reserved slots are at the back of the magazine.

2. Install a cleaning cartridge into Reserved Slot #1.
3. Enable the Auto Clean option on the Configuration menu:

From the Main menu, select Library Options / Auto Clean / Enabled.

Running a Cleaning Cartridge Manually

1. Install the cleaning cartridge into any slot. (Slot 0, for example.)
2. At the Default screen, press the **Enter** button. The following Main menu screen appears:

```
► Load/Unload
  Remove Magazine
  Maintenance Menu
  Configure Menu          ↓
```

3. Scroll down to the Maintenance menu and press the **Enter** button. The following Maintenance submenu appears:

```
► Clean Drive
  Diagnostic menu
  Demo Menu
  Flash Update          ↓
```

4. Press the **Enter** button once to select Clean Drive. The following Cleaning submenu appears:

```
Cleaning:
► *Drv 0
Using:
  *Slot 0
```

5. Press the **Enter** button to accept Drive0. The ► moves to line 4 of the display. The choices available on Line 4 are slots 0 through 18. Press the **Enter** button again to use the cartridge in Slot 0.

NOTE: If you cannot use slot 1 for the cleaning cartridge, you can scroll line 4 to select another slot.

6. The following Cleaning Confirmation screen appears:

```
Cleaning:      Drive 0
Using:        Slot 0
ENTER To Execute
ESCAPE To Cancel
```

7. As the Cleaning Confirmation screen indicates, to execute the cleaning operation, press the **Enter** button. If the Cleaning Confirmation screen does not show your intended drive and cleaning cartridge, press the **Escape** button to return to the Cleaning submenu.

When you press the **Enter** button, the following Cleaning In Progress screen appears:

```
Cleaning:      Drive 0
Using:        Slot 0
```

Cleaning In Progress

When the cleaning operation completes, the Default screen reappears.

Removing the Cleaning Cartridge

1. Examine the Default screen on the control panel to make sure the cleaning cartridge has been unloaded from the drive. If not, then unload it using the Load/Unload menu, as described in Chapter 2, "Operation."
2. Remove the magazine from the Library. See "Inserting and Removing Cartridges" in Chapter 2.
3. Remove the cleaning cartridge from the magazine.
4. Insert any desired data cartridge into the slot vacated by the cleaning cartridge.
5. Insert the magazine into the Library.
6. Close the magazine door.

Exercising the Library Robotics

To fully exercise the library robotics, use the Demo option as follows:

1. From the Maintenance menu, select the Demo submenu.
2. Select Demo 1.

The library robotics begin to move cartridges randomly from slot to slot, displaying the number of passes on the screen.

If all slots in the magazine are full, Demo 1 loads a cartridge into DLT0 and leaves it there. If you press the **▲** button while Demo 1 is running, the Library loads a cartridge into DLT0, unless DLT0 is full. If you press the **▲** button again, the cartridge is unloaded from DLT0 and returned to the magazine.

Demo 1 runs continuously as long as the Library has power.

To pause Demo 1, press and hold the **Escape** button until a flashing message displays that the test is paused.

To stop Demo 1, press the **Escape** button a second time to return to the Main menu.

Chapter 4

Troubleshooting

Introduction

This chapter describes the problems that can cause the Compaq StorageWorks SSL2000 Series Library (AIT Library) to malfunction, including:

- Platform problems
- General drive errors
- Error recovery
- Fault Symptom Codes (FSCs)

Platform Problems

Incorrect installation and configuration cause platform problems. In this case, the Library appears to be operating normally, but no data can be interchanged. You may or may not get an error code on the control panel. To identify an error caused by this type of problem, check your installation and configuration setup. See Appendix C, “Installation,” for more information.

General Drive Errors

General drive errors usually result from a miscommunication between a module’s processor and a drive processor or a mechanical malfunction within the Library.

Both platform problems and general drive errors display an error message and a Fault System Code (FSC) on the control panel. Use the FSC to report errors to your Technical Support representative, or in some cases, to determine a recovery procedure.

A simple error recovery procedure appears at the bottom line of the control panel display. You can clear some errors by pressing the **Enter** button on the control panel or by cycling the power to the Library.

Error Recovery

Figure 4-1 outlines the recommended steps for error recovery. You should follow this chart in all cases.

Error Recovery Procedures (ERPs) are listed in detail in Table 4-1; FSCs are listed in Table 4-2. An ERP is also listed for each FSC.

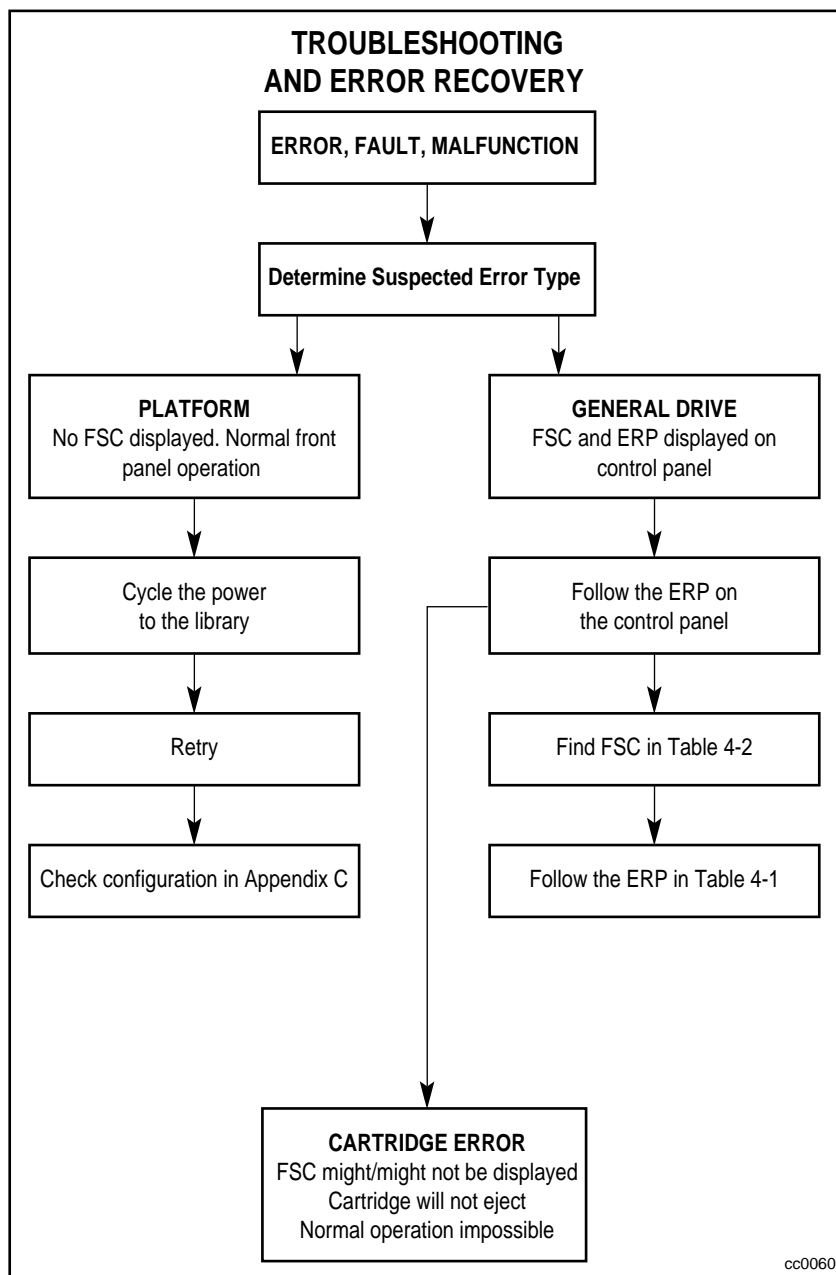


Figure 4-1. Troubleshooting flowchart

Error Recovery Procedures

Table 4-1 lists ERPs for errors reported on the front panel of the Library.

| ERP Code | Procedure/Description |
|----------|---|
| C | Cycle power to the Library using the AC switch on the front panel. Wait 30 seconds to power on again. |
| D | Turn off power to the Library and inspect connectors and cables. |
| F | Invalid operation. Select parameters correctly and try again. |

Fault Symptom Codes (FSCs)

FSCs that appear on the Fault screen are described in Chapter 2, “Operation.” A descriptive message and instructions for clearing the fault accompany each FSC. If a fault persists, look up the FSC in Table 4-2 to determine the error recovery procedure.

| FSC | Message | ERP |
|------|--|-----|
| 3001 | Picker Tries Escd Power Down to Clear | C,D |
| 3002 | Picker Tach Errors Power Down to Clear | D |
| 3003 | Elevator Tach Errors Power Down to Clear | D |
| 3004 | Elevator Jammed Power Down to Clear | C,D |
| 3005 | Picker Jammed Power Down to Clear | C,D |
| 5002 | All Drives/Slots Empty Press Enter to Clear | F |
| 5003 | All Drives/Slots Full Press Enter to Clear | F |

continued

Table 4-2
Fault Symptom Codes *continued*

| FSC | Message | ERP |
|------|---|-----|
| 5012 | All Drives Full Press Enter to Clear | F |
| 5014 | AIT Already Loaded Press Enter to Clear | F |
| 5015 | Expired Cleaning Cart Press Enter to Clear | F |
| 5016 | Not a Cleaning Cart Press Enter to Clear | F |

If an error message that is not included in Table 4-2 appears, write down the fault code number and follow the recovery procedure described on line 4 of the display.

Parts Removal and Replacement

Introduction

This chapter describes procedures for removing and replacing Field Replaceable Units (FRUs) for the Compaq StorageWorks SSL2000 Series Library (AIT Library). For a complete list of FRUs, spare parts, accessories and part numbers, see “Appendix B” of this manual.

FRUs

- Bar code reader
- Controller board
- Door solenoid
- Tape drive
- Fan assembly
- Front panel
- Magazine guide
- Magazine latch solenoid
- Power supply assembly
- Power switch
- Shuttle assembly
- Pass-through mechanism (PTM)

Precaution

- You should be trained and authorized to perform these procedures.
- Before performing any of the following procedures, take all appropriate precautions to prevent damage from Electro-Static Discharge (ESD).
- Always disconnect AC power before working on any of the Library internals.
- When any procedure requires you to manually move the shuttle assembly, always push the assembly from the bottom and never from the top.

Ferrites

To protect against Electro-Magnetic Interference (EMI), many cables are equipped with attached ferrite assemblies. The ferrite cores are encased in two-part plastic enclosures that clasp shut around the cables. You will find moving cables easier if you remove an obstructing ferrite. If so, pry the enclosures open gently in order to not break the clasps. Be sure to reposition each ferrite after you complete the replacement procedures.

Using Loctite 222

All screws that do not use lock washers, captive washers, or lock nuts must have Loctite 222 applied when re-assembled in the field.

NOTE: If you neglect this step, the mechanism could fail prematurely.

Some parts have been assembled using screws with Loctite applied. You will have to use extra torque when removing these screws. Be careful not to strip them. Spare screws are included in most FRU kits.

Removing and Replacing the Bar Code Reader

To remove the bar code reader:

1. Pushing only from the bottom of the assembly, move the shuttle three or four inches from the front panel.
2. Pushing only from the bottom of the assembly, move the picker as close as you can toward the magazine (see Figure 5-1).

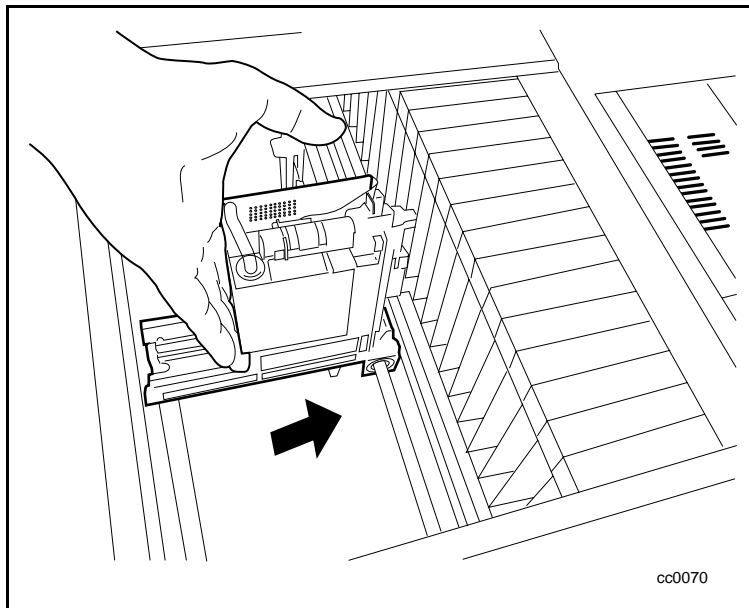


Figure 5-1. Moving the shuttle assembly

3. Disconnect the bar code reader cable (see Figure 5-2).

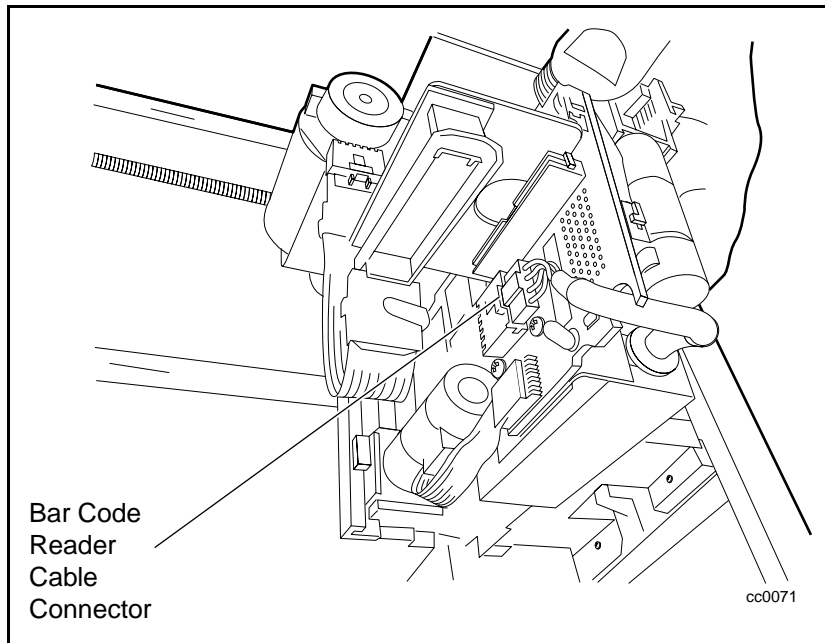


Figure 5-2. Disconnecting the bar code reader cable

4. Slide the bar code reader out and away from the shuttle mechanism (see Figure 5-3).

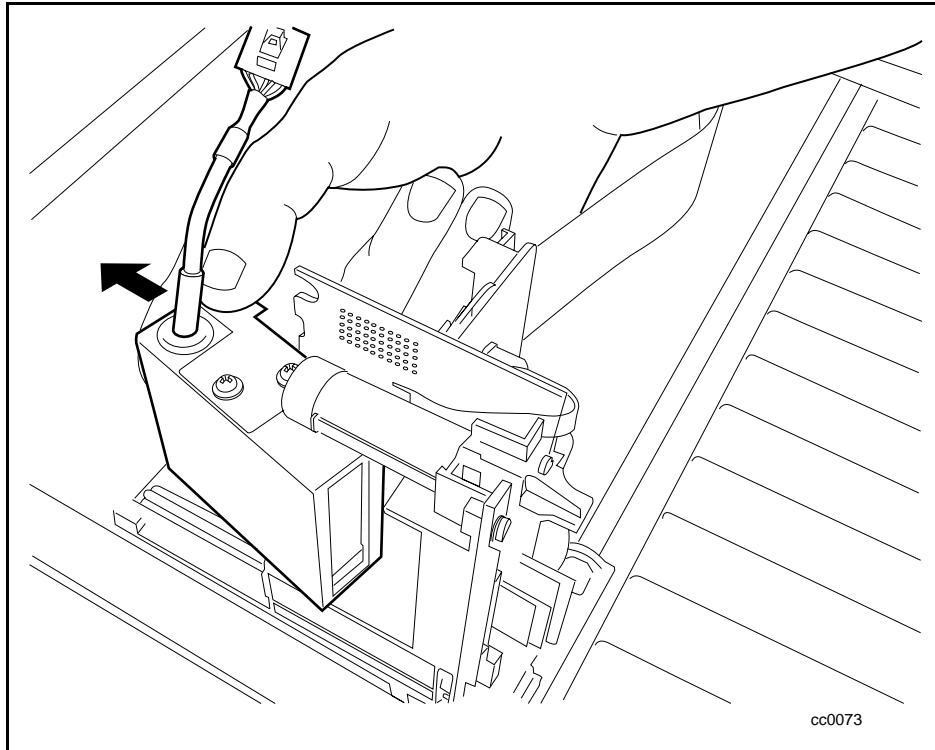


Figure 5-3. Removing the bar code reader

To replace the bar code reader:

1. Slide the new bar code reader on the shuttle assembly.
2. Tighten the two screws that secure it to the assembly (see Figure 5-3).
3. Reconnect the bar code reader cable (see Figure 5-2).

Removing and Replacing the Controller Board

To remove the controller board:

1. Remove the power supply as described later in this chapter.
2. Disconnect the following from the controller board:
 - a. Operating panel harness (J4)
 - b. Front door opto cable (J9)
 - c. Front door solenoid cable (J11)
 - d. Magazine opto cable (J12)
 - e. Magazine solenoid cable (J14)
 - f. Serial cables for drive 0 (J7) and drive 1 (J6)
 - g. SCSI cable.
3. Remove the four jack screws (see Figure 5-4):
 - a. Two for the motor connector
 - b. Two for the diagnostic connector.

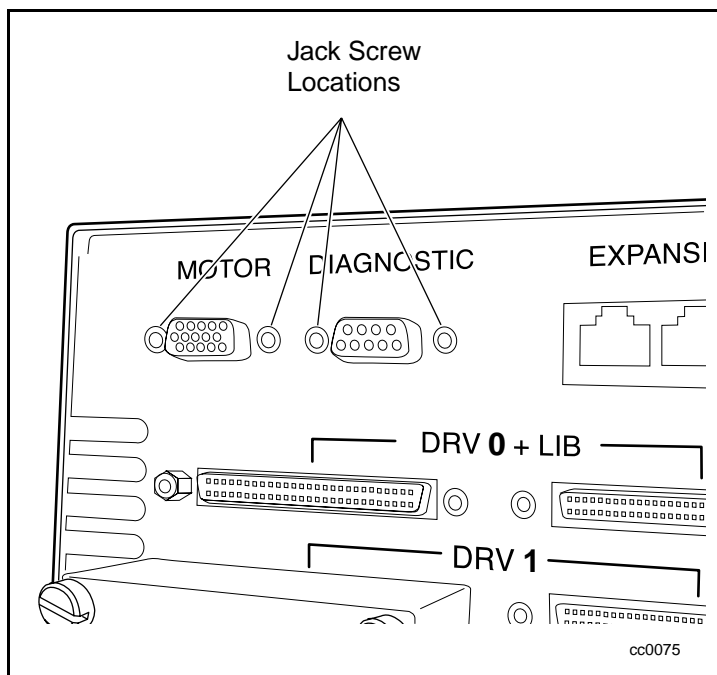


Figure 5-4. Jack screw locations

- Slide the controller board toward the front ¼-inch along the three guide pins (see Figure 5-5 and Figure 5-6).

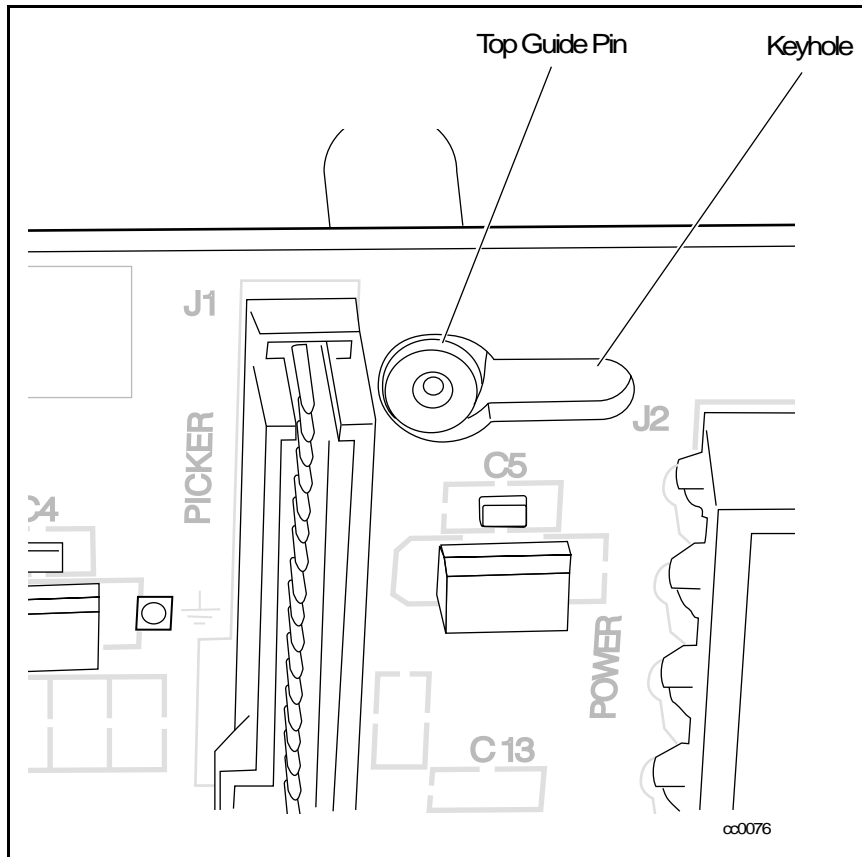


Figure 5-5. Top guide pin and keyhole

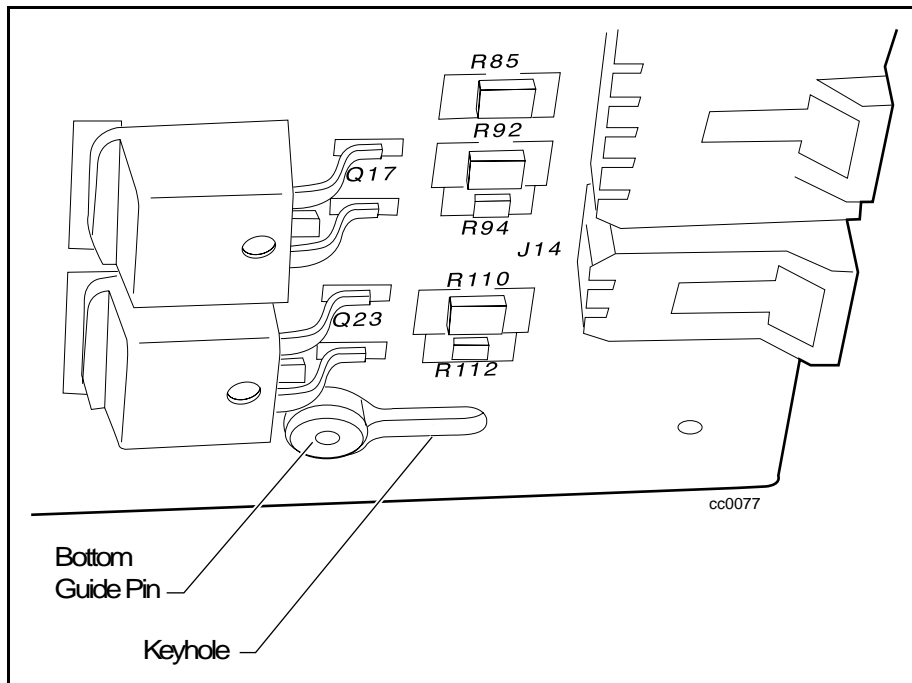


Figure 5-6. Bottom guide pin and keyhole

5. Lift the controller board off the guide pins (see Figure 5-7).

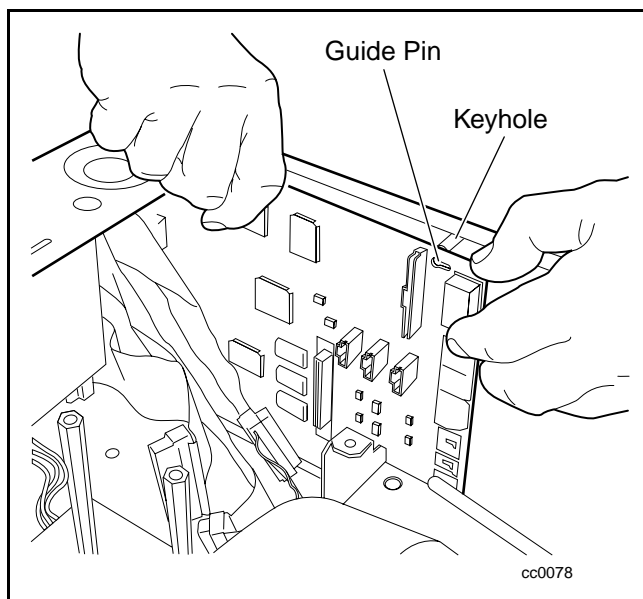


Figure 5-7. Removing the controller board

To replace the controller board:

6. Place the new board on the three guide pins (see Figure 5-8).

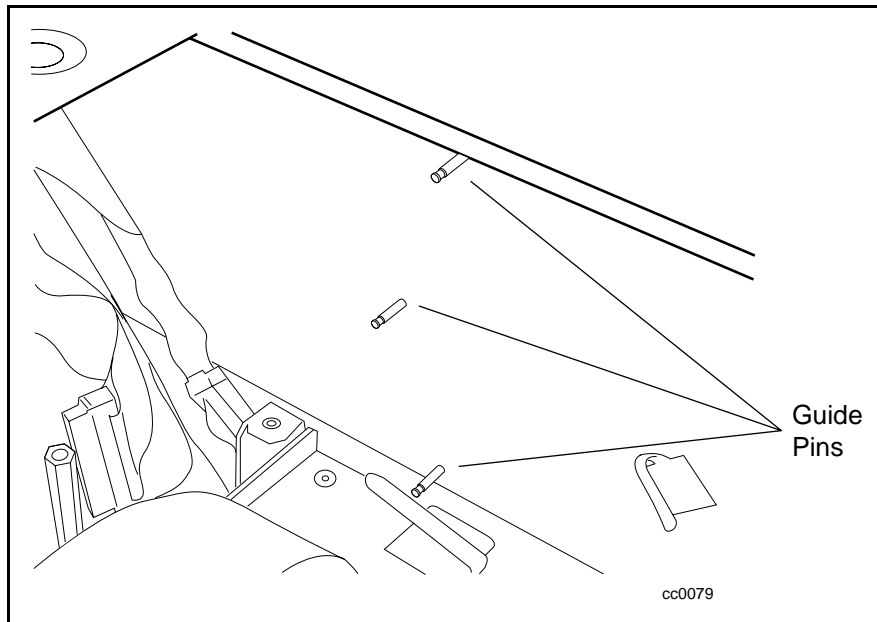


Figure 5-8. Replacing the controller board

7. Slide the board toward the rear $\frac{1}{4}$ -inch along the pins (see Figure 5-5 and Figure 5-6).
8. Make sure that you seat the connectors on the back correctly:
 - a. Two for the motor connector
 - b. Two for the diagnostic connector
9. Reconnect the following to the controller board:

Note should come AFTER substeps

NOTE: The magazine and front door solenoids are identical. Carefully follow their cables back to ensure that you make the proper connections.

- a. SCSI cable
 - b. Serial cables for drive 0 (J7) and drive 1 (J6)
 - c. Magazine solenoid (J14)
 - d. Magazine opto (J12)
 - e. Front door solenoid (J11)
 - f. Front door opto (J9)
 - g. Operating panel harness (J4)
10. Replace the power supply as described later in this chapter.

Removing and Replacing the Door Solenoid

To remove the door solenoid:

1. Remove the magazine.
2. Remove the two screws that fasten the door solenoid to the bracket (see Figure 5-9).

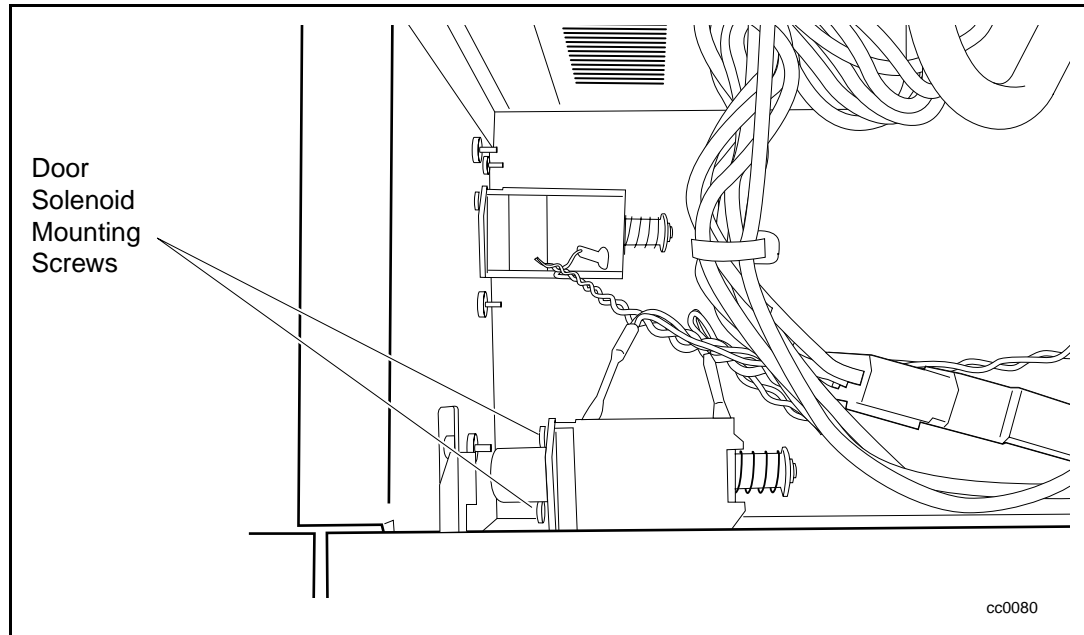


Figure 5-9. Removing the door solenoid

3. Slide out the door solenoid to the power supply side.
4. Disconnect the door solenoid cable from connector J11 on the controller board, and then remove the door solenoid.

To replace the door solenoid:

5. Position the new solenoid on the mounting bracket.
6. Tighten the two screws.
7. Reconnect the solenoid cable to connector J11 on the controller board.

Removing and Replacing a Tape Drive

To remove a tape drive:

1. Turn off the power to the Library.
2. Unplug the Library from the power source.
3. Unplug the robotics ribbon cable from the controller board (see Figure 5-10).
4. Remove the brace plate (see Figure 5-10).

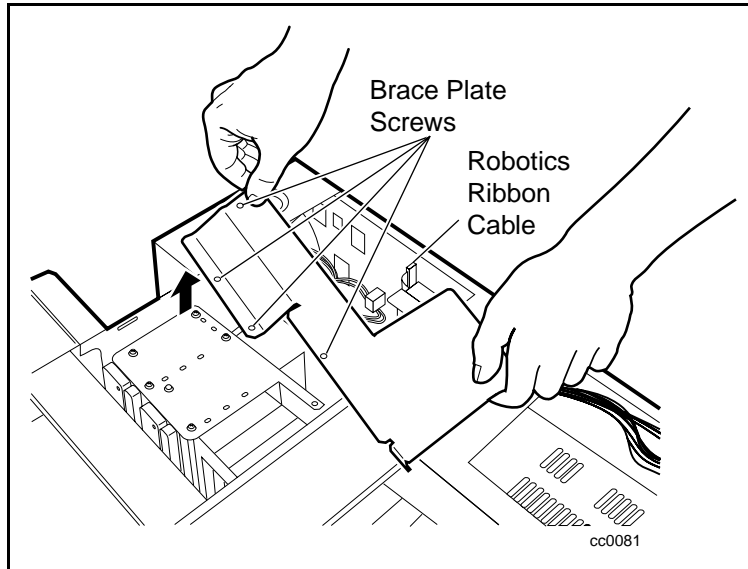


Figure 5-10. Removing the brace plate

5. Remove the two upper drive mounting plate screws (see Figure 5-11).

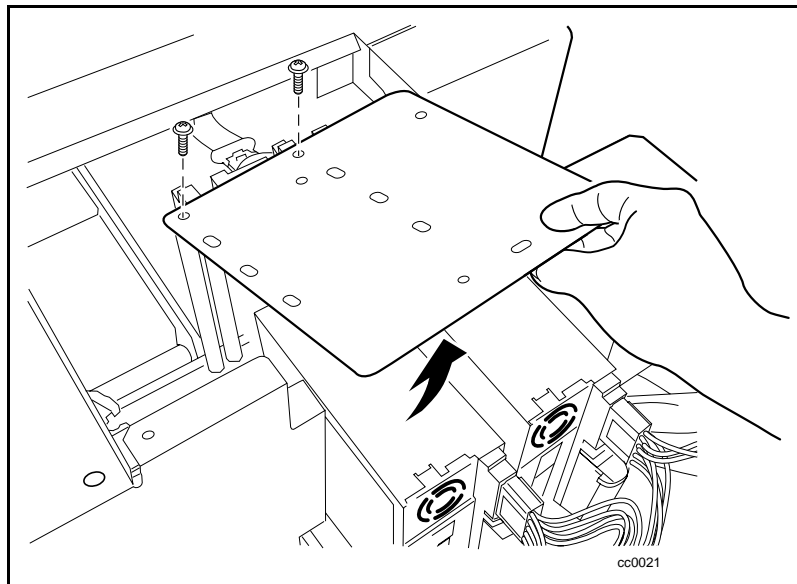


Figure 5-11. Removing the upper drive mounting plate

6. Lift out the upper drive mounting plate (see Figure 5-11).

7. Disconnect the power, serial cable, and SCSI connectors from the desired tape drive (see Figure 5-12).

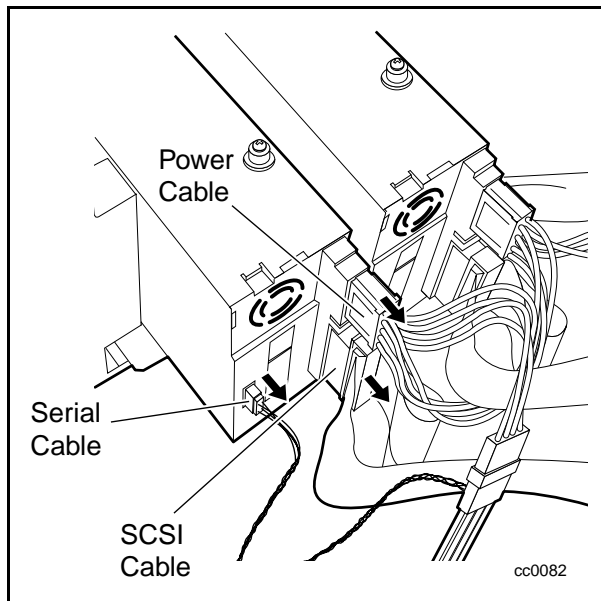


Figure 5-12. Disconnecting the tape drive

8. Lift the tape drive out of the Library chassis (see Figure 5-13).

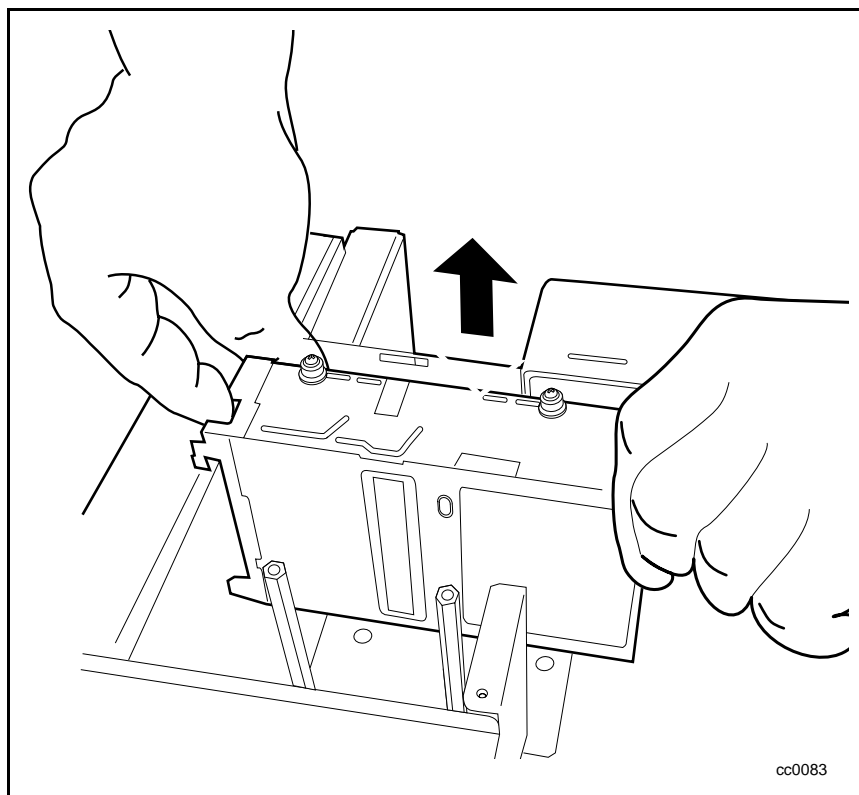


Figure 5-13. Removing the tape drive

- Remove the four alignment pins for installation on the replacement tape drive (see Figure 5-14).

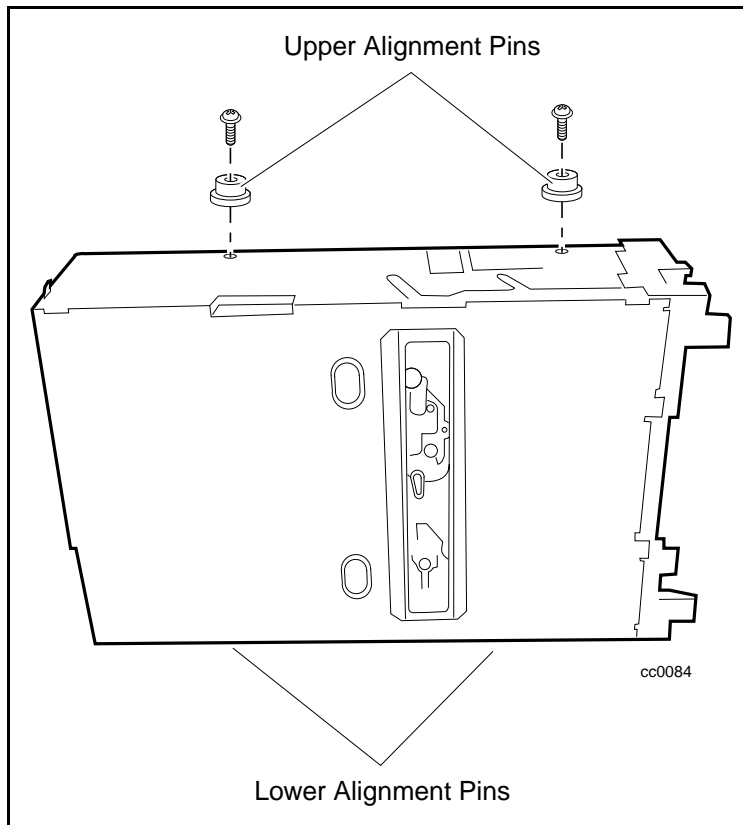


Figure 5-14. Removing the alignment pins

NOTE: The alignment pin is an assembly made of a plastic spacer ("top hat") and a screw (see Figure 5-14).

To replace a tape drive:

- Install the four alignment pins on the replacement tape drive (see Figure 5-14).
- Lower the new tape drive into the Library chassis (see Figure 5-13).
- Connect the power, serial cable, and SCSI connectors to the drive (see Figure 5-12).
- Replace the upper drive mounting plate, and tighten the two retaining screws (see Figure 5-11).
- Replace the brace plate cover (see Figure 5-10).
- Reconnect the Library to the power source.
- Turn on the Library and test the operation of the tape drive.

Removing and Replacing the Fan Assembly

To remove the fan assembly:

1. Turn off the Library.
2. Unplug the Library from the power source.
3. Remove the brace plate cover (see Figure 5-10).
4. Remove the power supply as described later in this chapter.
5. Remove the four mounting screws on the fan.
6. Lift the fan out, freeing its cable from the cable clamp.

To replace the fan assembly:

1. Place the new fan in the Library with fan flow down as indicated by the arrows molded into the fan housing (see Figure 5-15).
2. Place the fan cable under the cable clamp.
3. Tighten the four screws on the fan.

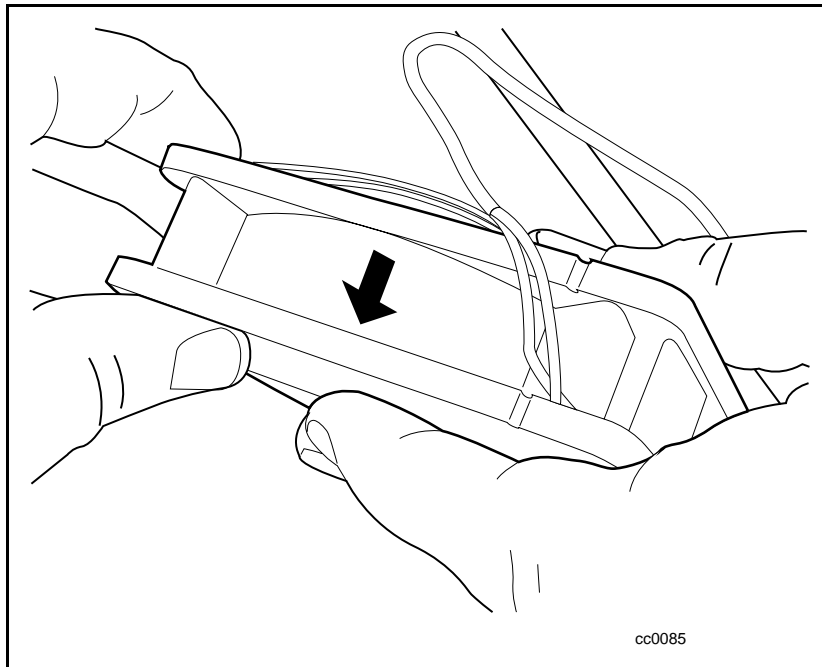


Figure 5-15. Replacing the fan assembly

4. Replace the power supply as described later in this chapter.
5. Replace the brace plate cover (see Figure 5-10).

Removing and Replacing the Front Panel

To remove the front panel:

1. Remove the outside cover from the Library (see Appendix C).
2. Remove the six screws that secure the front panel to the Library chassis (see Figure 5-16).

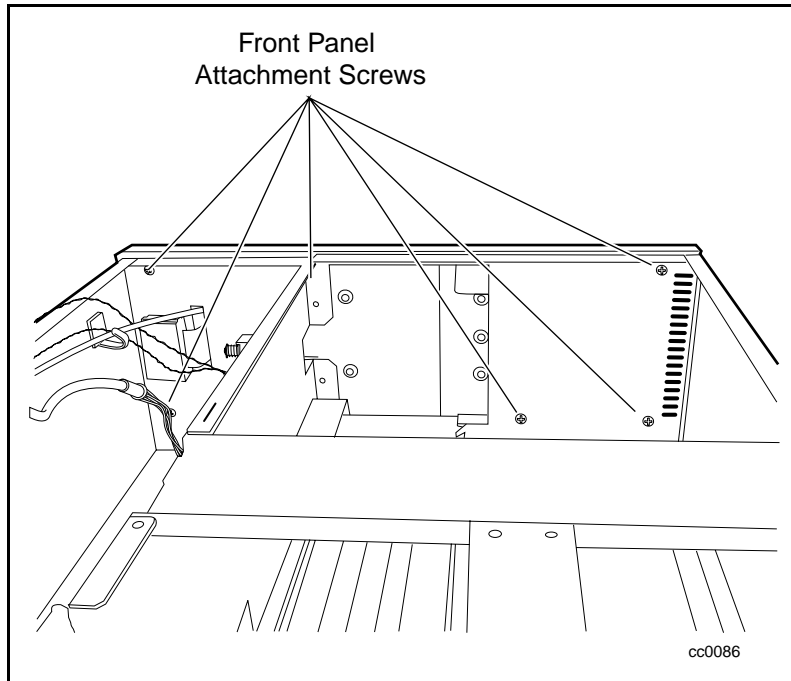


Figure 5-16. Front panel attachment screw locations

3. Pull the front panel forward and away from the Library chassis.

4. Disconnect the front panel cable (see Figure 5-17).

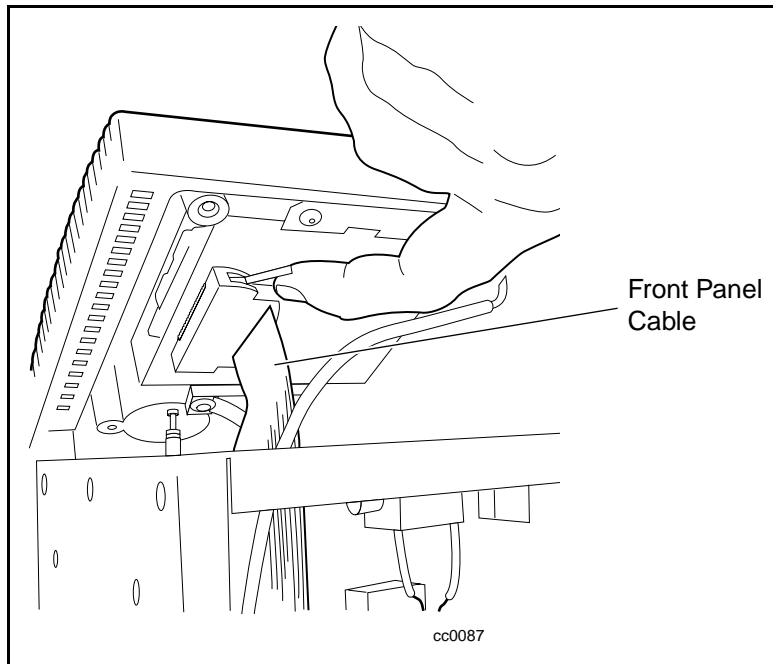


Figure 5-17. Disconnecting the front panel cable

5. Disconnect the door opto sensor from connector J9 on the controller board.
6. Pull the door opto sensor cable through the cable cutout in the Library chassis.

To replace the front panel:

1. Push the door opto sensor cable through the cable cutout in the Library chassis.
2. Reconnect the front panel cable.
3. Reconnect the door opto sensor to connector J9 on the controller board.
4. Place the front panel on the front of the Library and then push it into place.
5. Tighten the six screws from inside the Library chassis (see Figure 5-16).

Removing and Replacing the Magazine Guide

To remove the magazine guide:

1. Remove the brace plate (see Figure 5-10).
2. Remove the upper drive mounting plate (see Figure 5-11).
3. Remove the tape drive(s) as described earlier in this chapter.

4. Remove the four hex standoffs that secure the bottom drive mounting plate to the Library chassis (see Figure 5-18).
5. Lift the bottom drive mounting plate away from the Library chassis (see Figure 5-18).

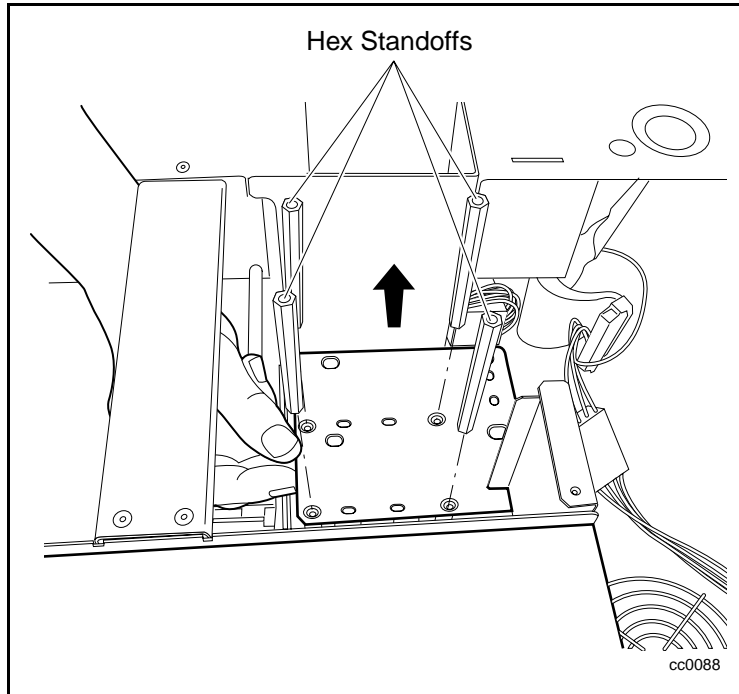


Figure 5-18. Removing the bottom drive mounting plate

6. Remove the nine screws that secure the magazine guide to the Library chassis (see Figure 5-19).

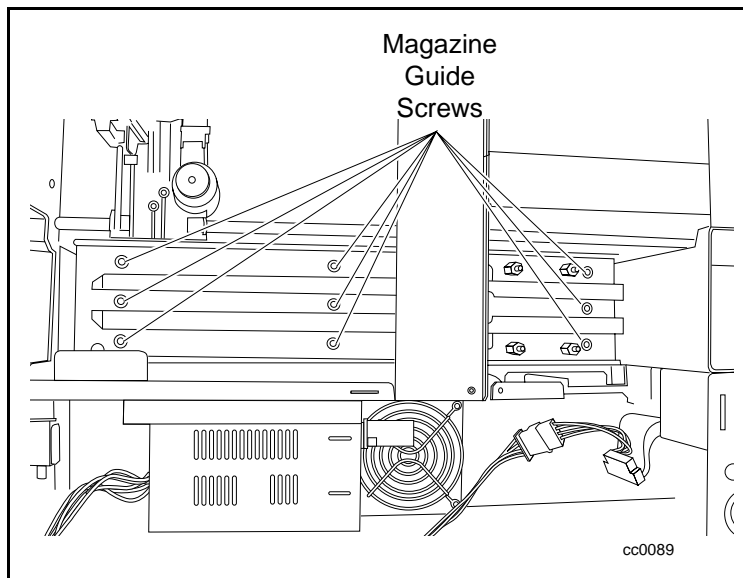


Figure 5-19. Magazine guide screw locations

7. Lift the magazine guide out through the front door (see Figure 5-20).

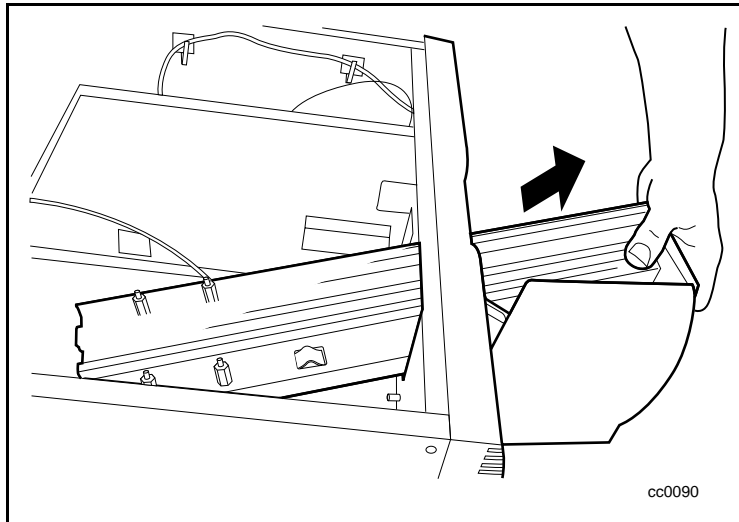


Figure 5-20. Removing the magazine guide

To replace the magazine guide:

1. Place the new magazine guide into the Library (see Figure 5-20).
2. Tighten the nine screws on the magazine guide (see Figure 5-19).
3. Replace the bottom drive mounting plate (see Figure 5-18).
4. After adding Loctite, install and fully tighten the four hex standoffs (see Figure 5-18).
5. Replace the tape drive(s) as described earlier in this chapter.
6. Replace the top drive mounting plate (see Figure 5-11).
7. Replace the brace plate cover (Figure 5-10).

Removing and Replacing the Magazine Latch Solenoid

To remove the magazine latch solenoid:

1. Remove the magazine.
2. Remove the two screws that secure the magazine latch cover to the Library chassis (see Figure 5-21).
3. Remove the magazine latch cover.

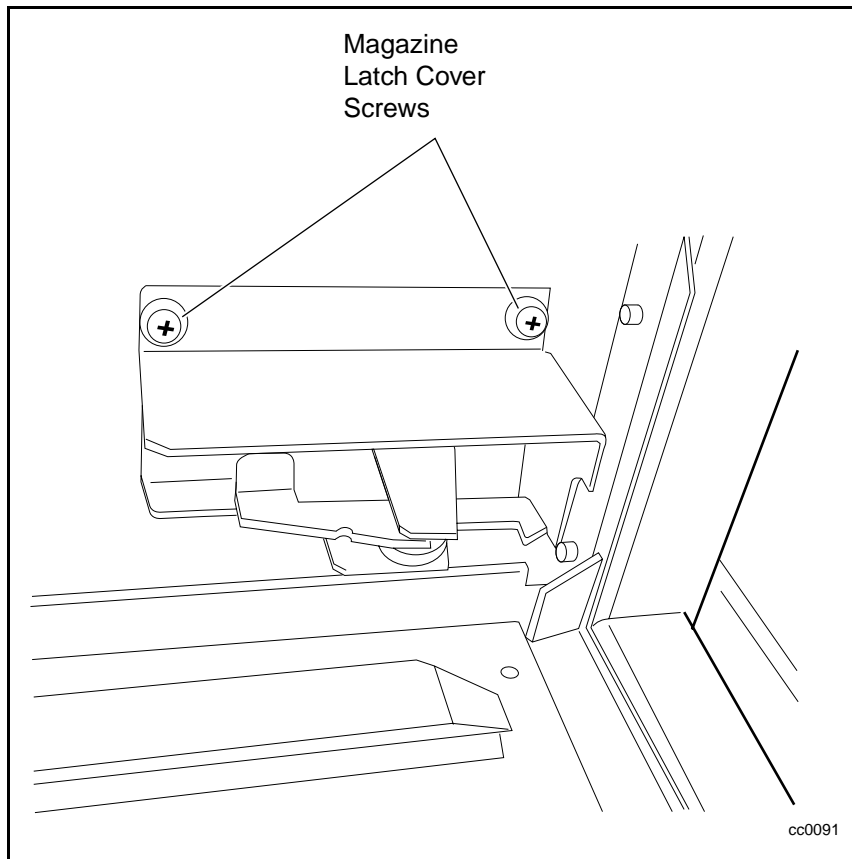


Figure 5-21. Removing the magazine latch cover

4. Remove the two screws that secure the magazine latch solenoid to its mounting bracket (see Figure 5-22).

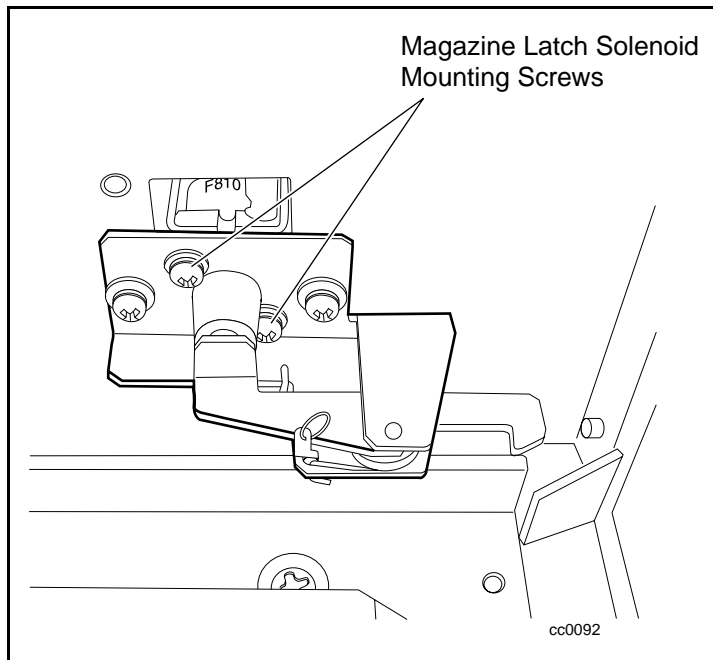


Figure 5-22. Magazine latch solenoid mounting bracket screw locations

5. Push the detached solenoid back through the opening into the power supply compartment.
6. Disconnect the cable at connector J14 on the controller board, and then remove the magazine latch solenoid.

To replace the magazine latch solenoid:

1. Position the magazine latch solenoid through the opening in the Library chassis toward the magazine compartment.
2. Tighten the two screws that attach the solenoid to its mounting bracket (see Figure 5-22).
3. Replace the magazine latch cover (see Figure 5-21).
4. Connect the cable at connector J14 on the controller board.

Removing and Replacing the Power Supply Assembly

To remove the power supply:

1. Turn off the Library.
2. Unplug the Library from the power source.
3. Remove the Library outside cover. If necessary, see Figure C-4 or Figure C-5.
4. Remove the brace plate cover (see Figure 5-10).

5. Disconnect the picker ribbon cable from connector J1 on the controller board (see Figure 5-23).

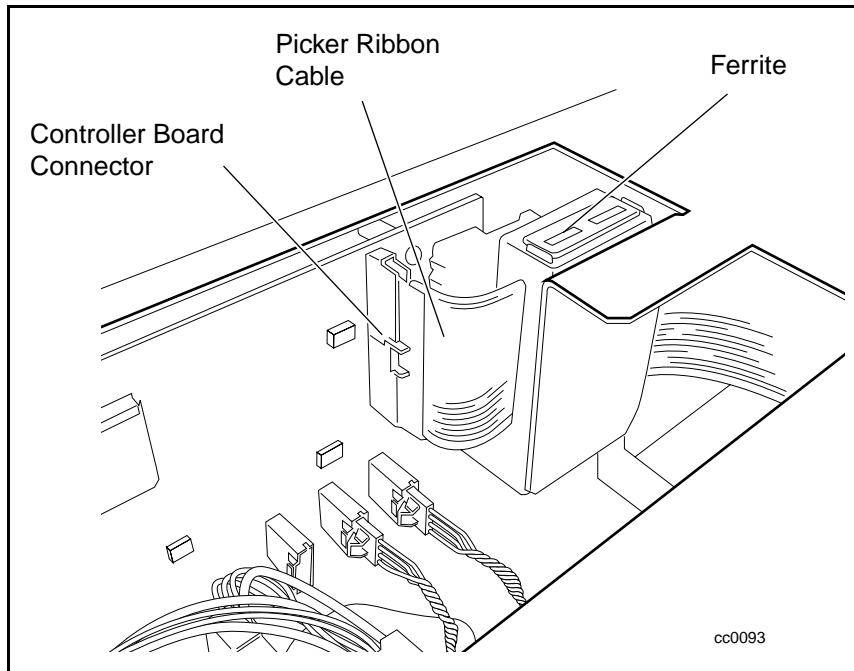


Figure 5-23. Disconnecting the picker ribbon cable

6. Bend the tabs back that hold the picker ribbon cable in place (see Figure 5-24).

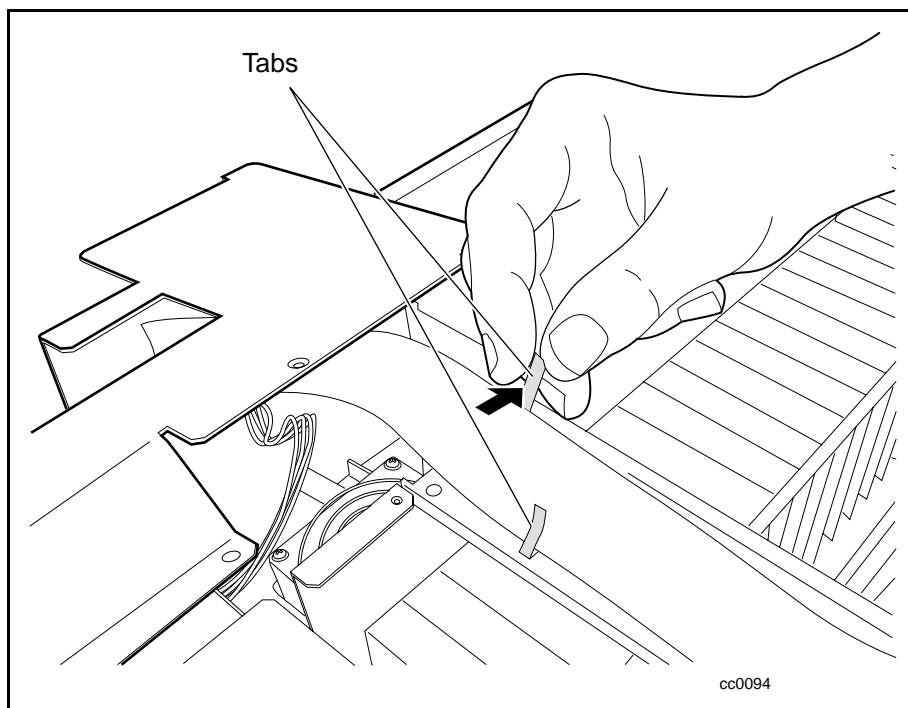


Figure 5-24. Picker ribbon cable tabs

7. Gently roll the brace plate cover and ribbon cable assembly over and safely out of the way (see Figure 5-25).

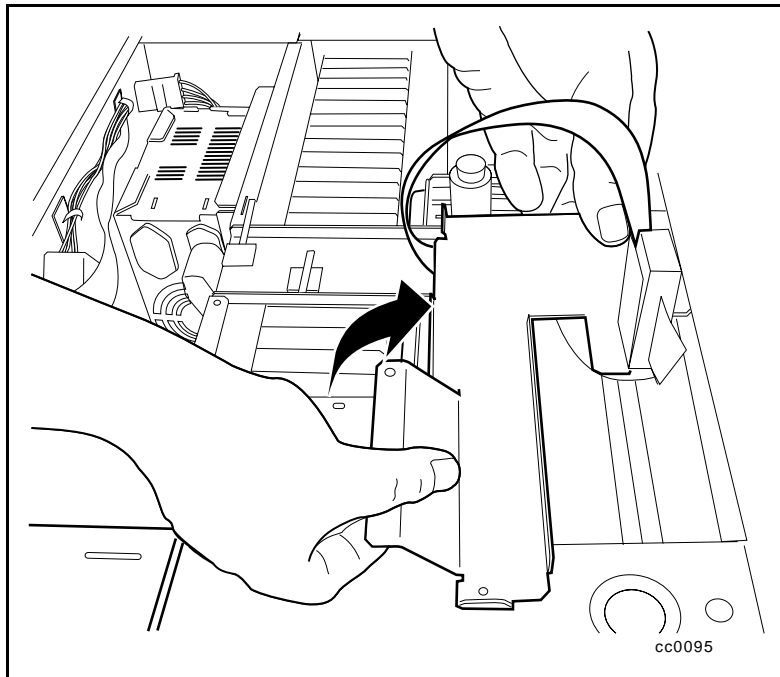


Figure 5-25. Turning the base plate

8. Unplug the power cable from the power supply (see Figure 5-26).

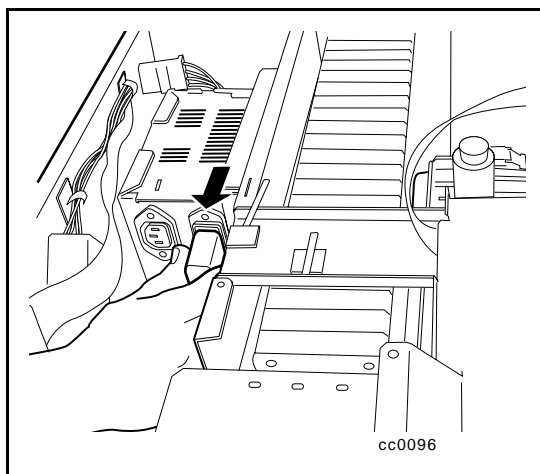


Figure 5-26. Unplugging the power supply

9. On the magazine side, remove the two screws that secure the power supply to the Library chassis (see Figure 5-27).

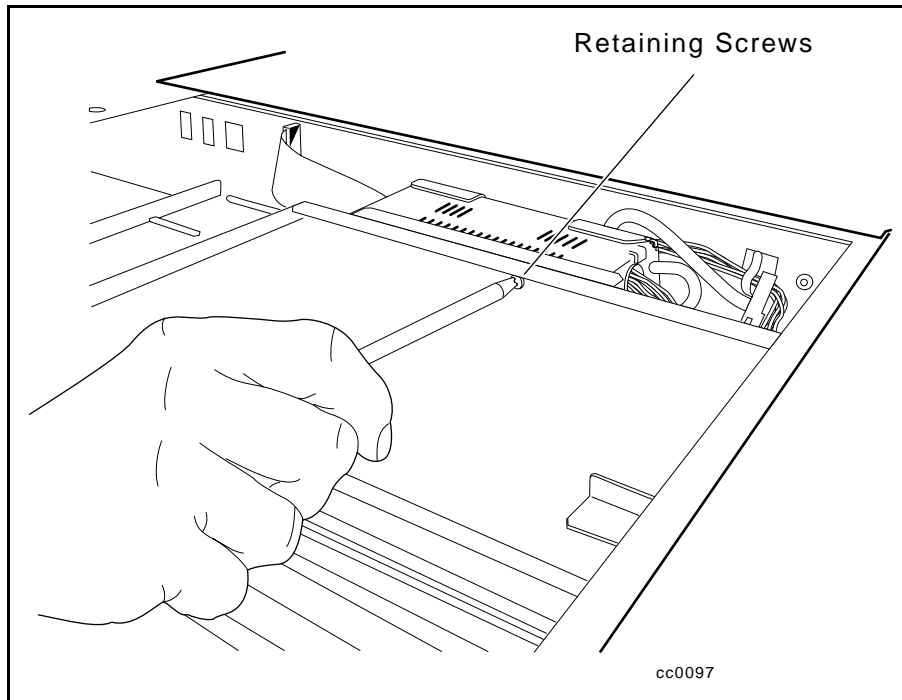


Figure 5-27. Power supply retaining screws

10. Disconnect the following from the power supply (see Figure 5-28):
 - a. Controller board (at connector J2)
 - b. Fan
 - c. Drive power harness

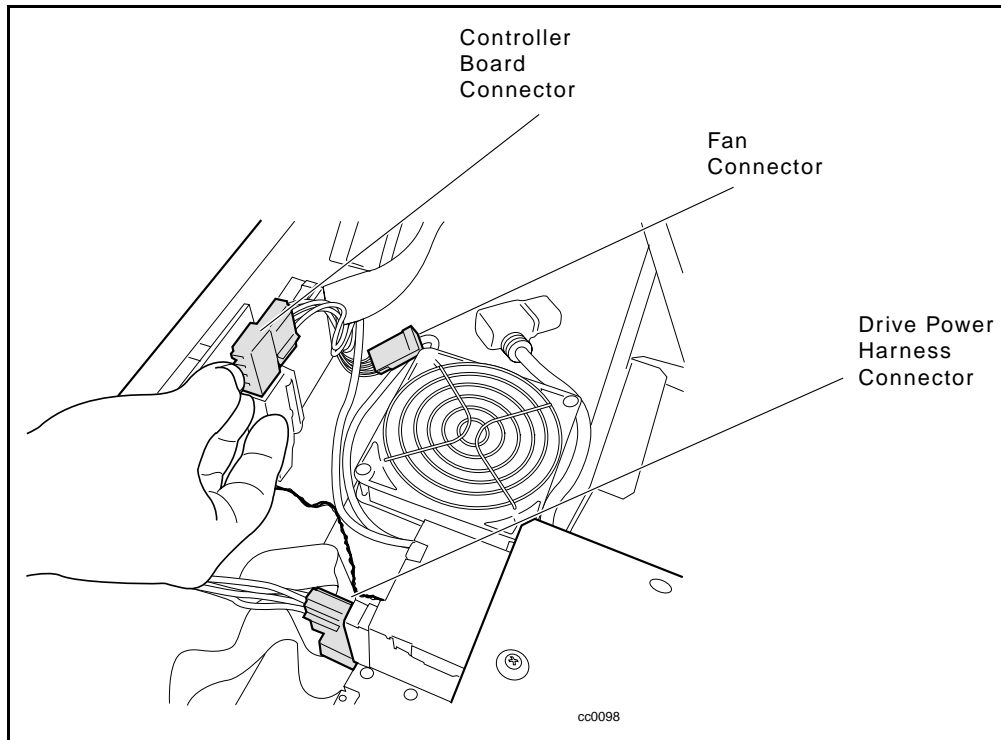


Figure 5-28. Disconnecting the controller board, fan, and drive power harness

11. Disconnect the wires to the power switch (see Figure 5-29).

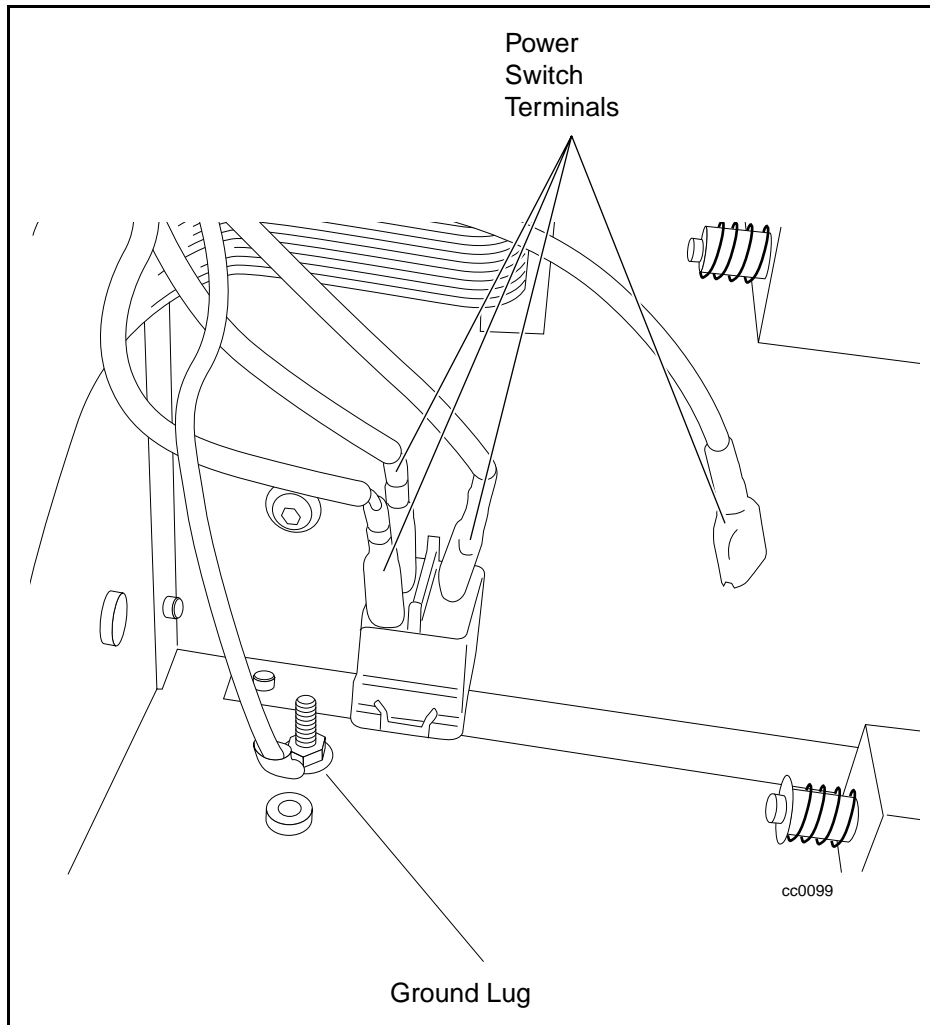


Figure 5-29. Disconnecting the power switch wires

NOTE: Pull on the spade terminal connector, not on the wire itself.

12. Disconnect the ground lug.

13. Lift out the power supply assembly out and then lay it on the magazine side, being careful not to bump the shuttle mechanism (see Figure 5-30).

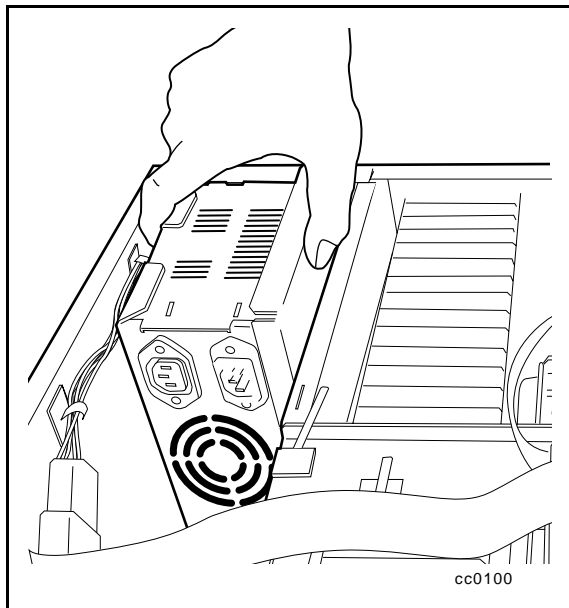


Figure 5-30. Removing the power supply

To replace the power supply:

1. Place the power supply in the Library chassis (see Figure 5-30).
2. Connect the wires from the power supply to the power switch (see Figure 5-29).
3. Connect the following to the power supply (see Figure 5-28):
 - a. Board (J2)
 - b. Fan
 - c. Drive power harness
4. Using two screws, secure the power supply to the Library chassis (see Figure 5-27).
5. Reconnect the power cable to the power supply (see Figure 5-31).

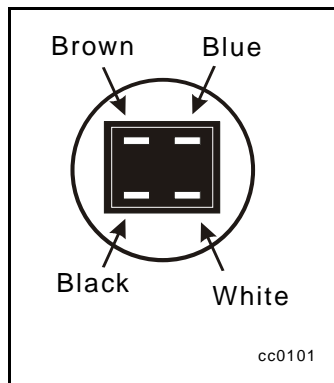


Figure 5-31. Connecting the power cable to the power supply

6. Replace the brace plate (see Figure 5-10).
7. Connect the Library to the AC power source.
8. Turn on the Library.

Removing and Replacing the Power Switch

To remove the power switch:

1. Unplug the Library from the power source.
2. Remove the power supply as described earlier in this chapter.
3. Remove the front panel as described earlier in this chapter.
4. Locate the power switch at the lower right of the Library chassis front, and then remove its two retaining screws (see Figure 5-32).

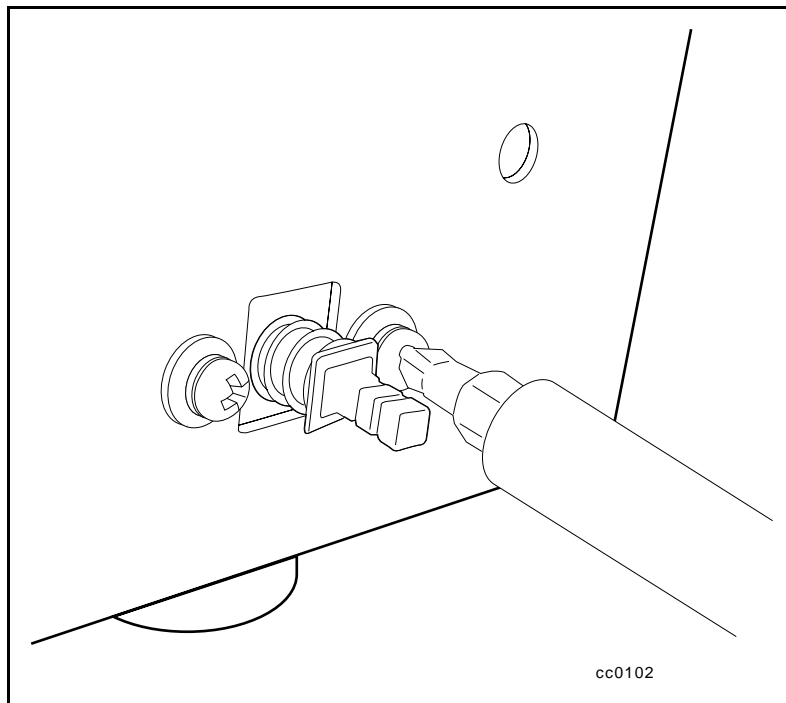


Figure 5-32. Power switch retaining screws

5. Lift out the power switch.

To replace the power switch:

1. Position the power switch through the front of the Library chassis.
2. Replace the two retaining screws in front.
3. Replace the front panel as described earlier in this chapter.
4. Replace the power supply as described earlier in this chapter.

Removing and Replacing the Shuttle Mechanism

To remove the shuttle mechanism:

1. Open the magazine door to the Library.
2. Remove the magazine from the Library.
3. Turn off the power to the Library.
4. Press down on the tab to release the shuttle mechanism cable clamp (see Figure 5-33).

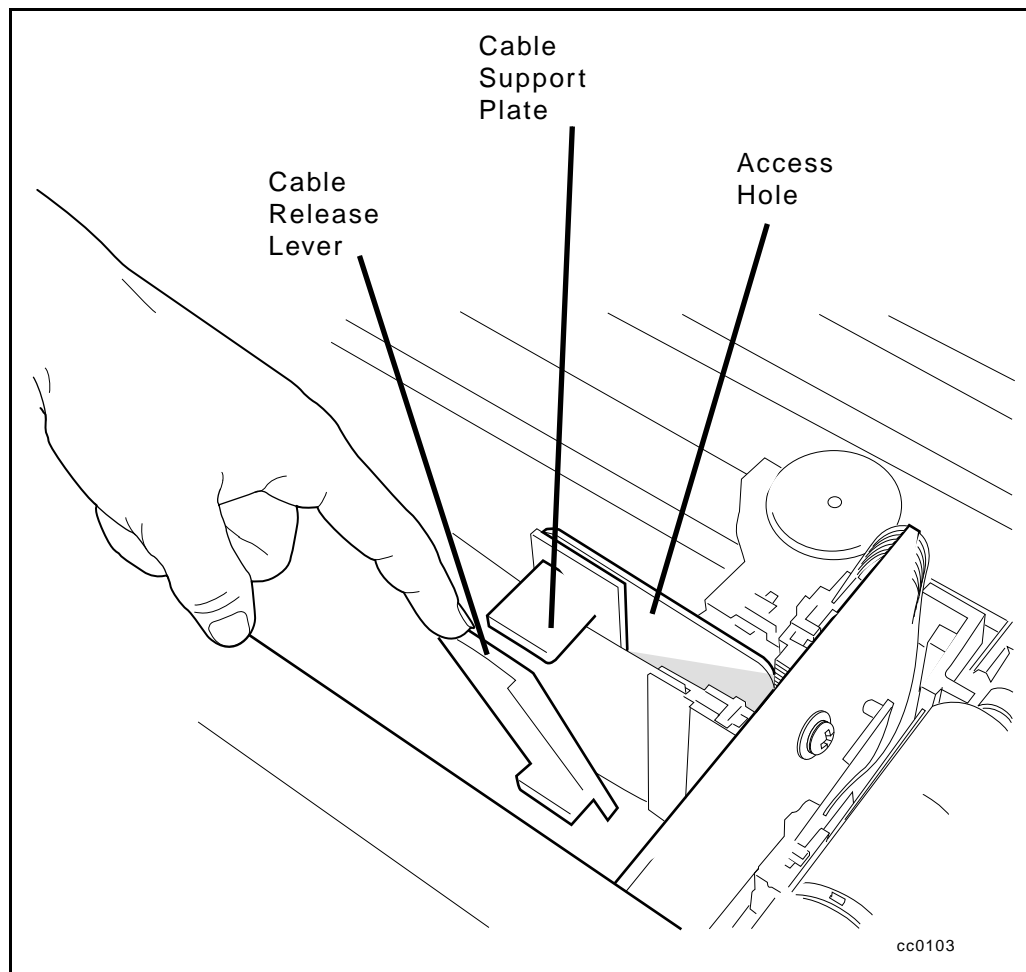


Figure 5-33. Cable clamp tab location

5. Push in on the cable release lever, accessed through the hole in the cable support plate (see Figure 5-34).

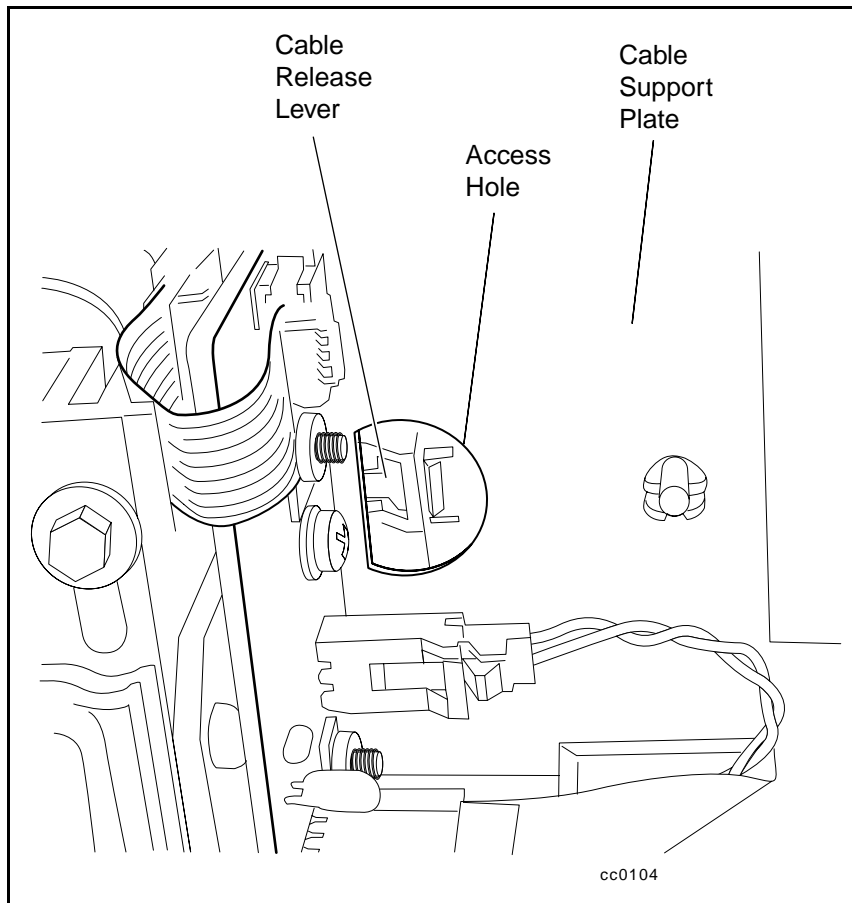


Figure 5-34. Cable release lever

6. Remove the shuttle mechanism cable.
7. Pushing only from the base, move the shuttle mechanism back half way (see Figure 5-35).

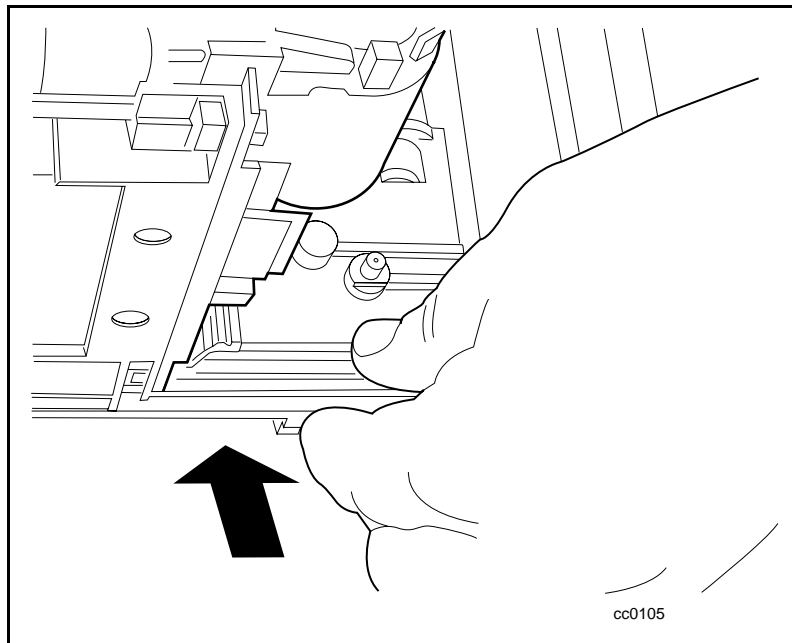


Figure 5-35. Pushing the shuttle mechanism



CAUTION: Never move the shuttle by pushing on the top of the mechanism.

8. Remove the screw that holds down the guide bar, using a 3 mm Allen wrench (see Figure 5-36 and Figure 5-37).

NOTE: You can also remove the screw through the access hole using a 3 mm hex driver.

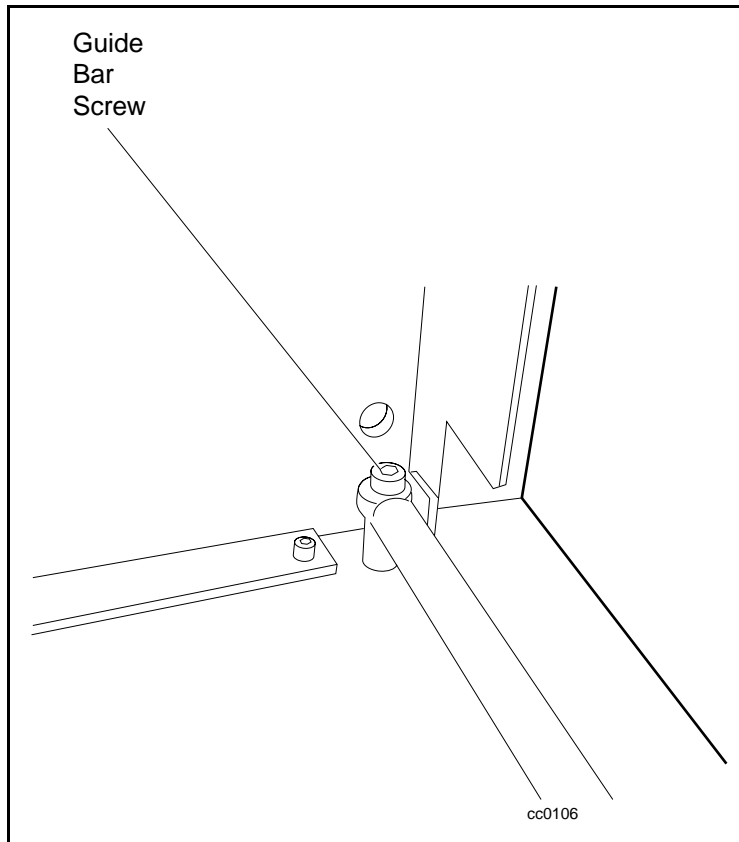


Figure 5-36. Removing the guide bar screw

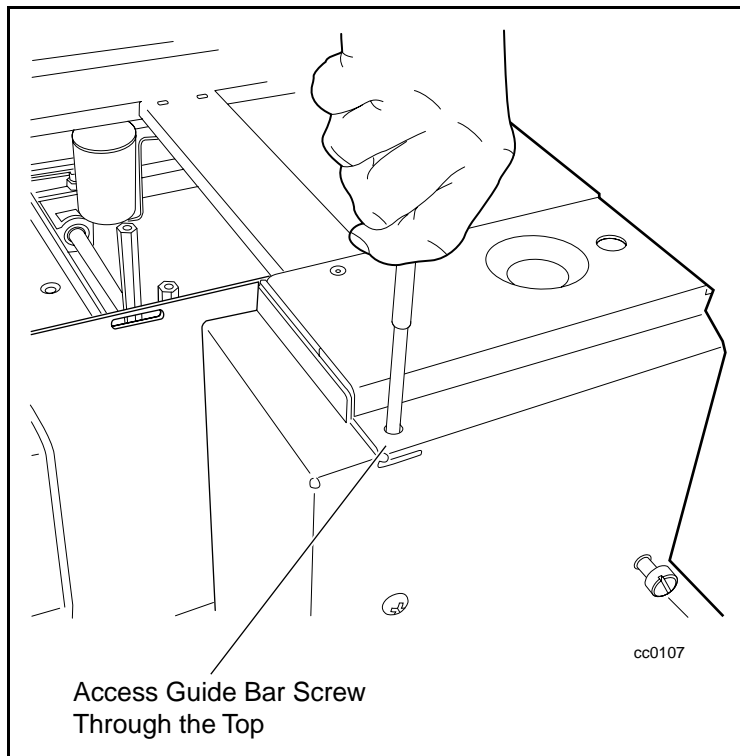


Figure 5-37. Accessing the guide bar screw

9. Lift the shuttle mechanism up, sliding the front off of the guide pin and moving it forward to release it from the anti-rotation bracket (see Figure 5-39 and Figure 5-40).

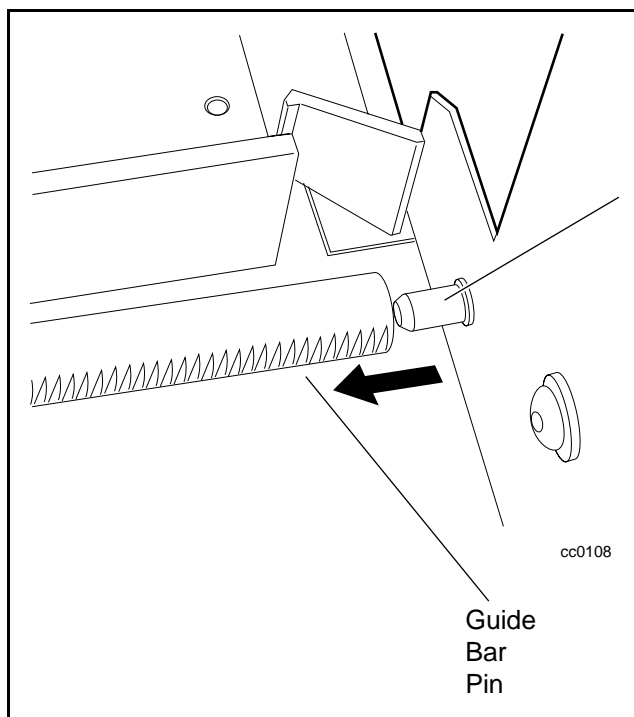


Figure 5-38. Lifting the shuttle mechanism

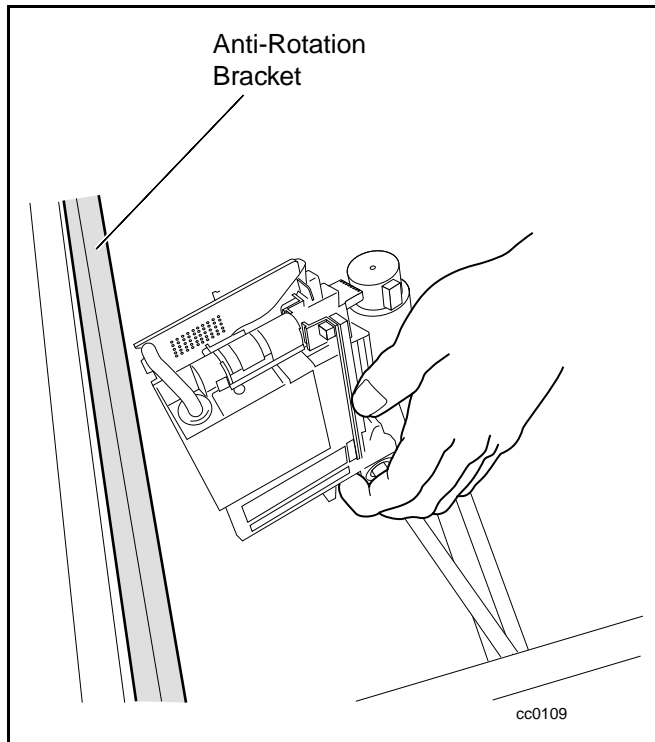


Figure 5-39. Anti-rotation bracket location

10. Lift the shuttle mechanism out through the top of the Library chassis (see Figure 5-40).

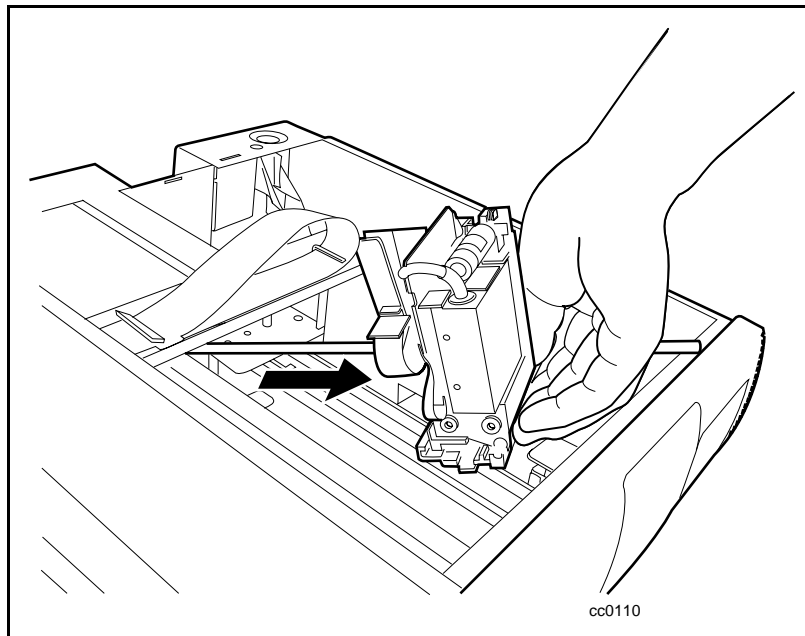


Figure 5-40. Removing the shuttle mechanism

To replace the shuttle mechanism:

1. Place the new shuttle mechanism in the AIT Library chassis, moving it back to engage the anti-rotation bracket and sliding it onto the pin (see Figure 5-40 and Figure 5-39).
2. Tighten the screw that holds down the guide bar (see Figure 5-36 and Figure 5-37).
3. Move the shuttle mechanism forward, pushing from the base. Do not push on the top of the mechanism (see Figure 5-35).
4. Reconnect the shuttle mechanism cable (see Figure 5-34).
5. Tighten the tab on the shuttle mechanism cable (see Figure 5-33).
6. Replace the magazine.
7. Close the magazine door.
8. Turn on the Library.

Removing and Replacing a PTM

To remove a PTM:

1. Disconnect AC power from the Library units.
2. Loosen the screws that secure the Library unit's mounting ears to the front of the storage cabinet.
3. Loosen the rear slide screws so that the Library units float freely in the storage cabinet.
4. Unplug the motor control cable from the PTM motor housing assembly (see Figure 5-41).
5. If the master unit (top) is to be removed for service, disconnect the motor cable and plug it into the unit directly below it (slave 0). Reconfigure slave 0 to be the master unit and slave 1 to be slave 0, slave 2 to be slave 1, and so forth (see Figure 5-41).

NOTE: After installation, there are software ramifications in changing a Library's configuration and should only be done if necessary.

6. Disconnect the RJ45 cable from the unit to be removed or serviced and then plug it into the next unit so all units remain in series.

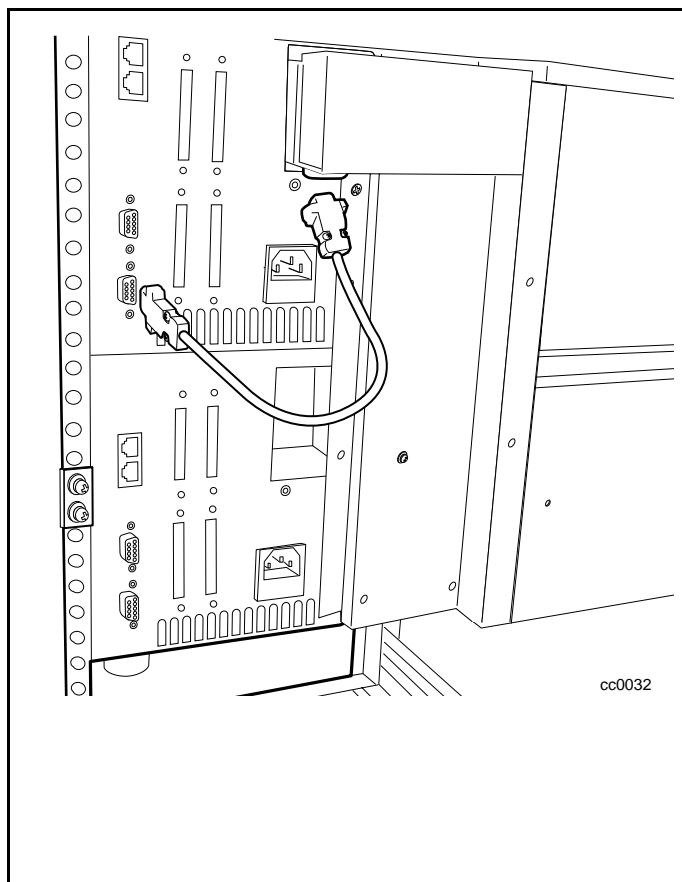


Figure 5-41. Unplugging the PTM motor housing assembly control cable

7. Remove the bullet-nose thumbscrews and washers (two per unit) that secure the PTM to the Library units (see Figure 5-42).

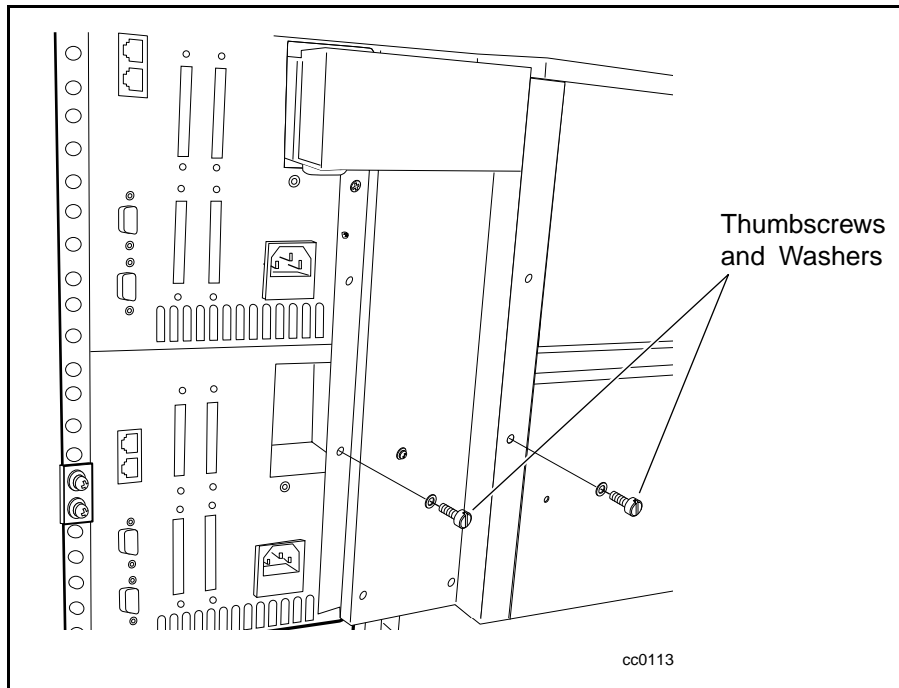


Figure 5-42. Removing the PTM

8. Gently pull the PTM out and away from the Library units (see Figure 5-42).

To replace a PTM:

1. Holding the PTM upright, position it against the rear panels so that the PTM motor housing assembly slides into the available space and the two pilot pins on the extrusion mate with the holes in the rear of the top Library unit (see Figure 5-43).

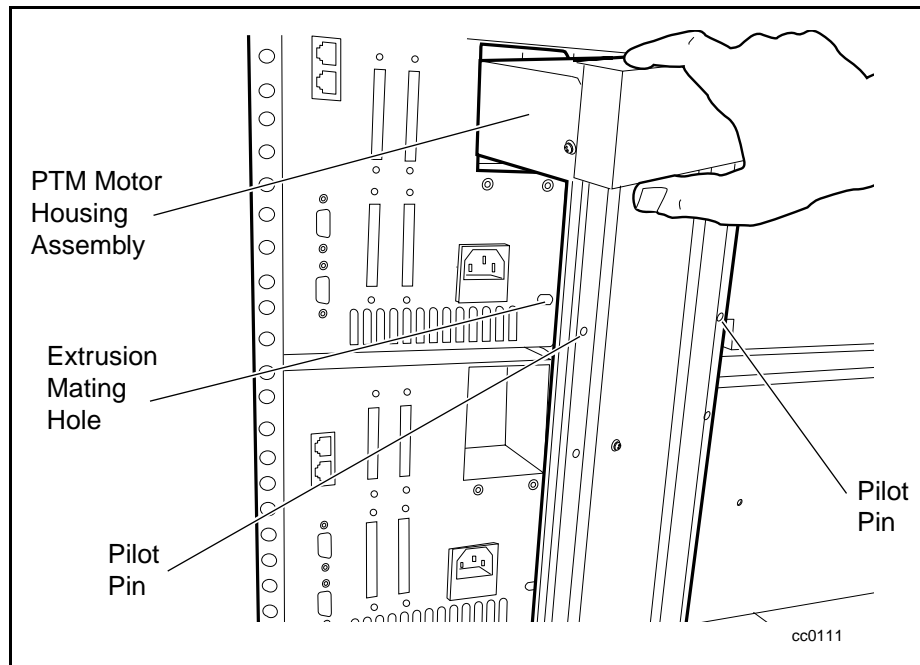


Figure 5-43. Installing the PTM

2. Attach the PTM to the master (top) unit using two bullet-nose thumbscrews and washers through the top two holes in the extrusion (see Figure 5-44). Do not fully tighten the thumbscrews at this time.

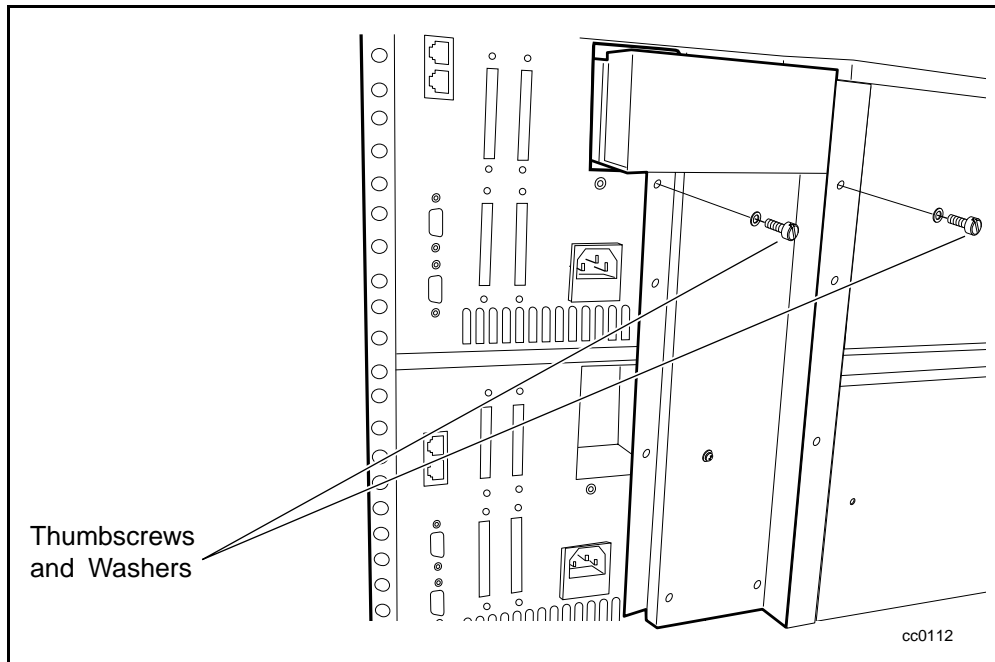


Figure 5-44. Securing the PTM to the master unit

3. Align the two holes on the extrusion with mounting holes on the slave unit and attach the PTM in place using two bullet-nose thumbscrews and washers (Figure 5-42). Do not fully tighten the thumbscrews at this time.

NOTE: If a screw hole is offset, push the slave unit slightly forward to make a gap between it and the channel.

4. Repeat Steps 2 through 4 for each additional slave unit. Do not fully tighten the thumbscrews at this time.
5. Tighten all rear storage cabinet slide screws.
6. Tighten all PTM thumbscrews.
7. Tighten all screws that secure the Library unit's mounting ears to the front of the storage cabinet.
8. Attach all power and communication cables.

Appendix **A**

Specifications

Introduction

This appendix lists the following specifications and regulatory requirements met by the Compaq StorageWorks SSL2000 Series Library (AIT Library):

- Specifications:
 - Operational performance
 - Reliability
 - Power
 - Mechanical
 - Environmental
 - Acoustic emission
- Regulatory requirements:
 - Safety
 - Electromagnetic Emission (EM)
 - FCC and VCCI

Table A-1
Operational Performance Specifications

| Description | Specification |
|---|---|
| Host Interface | Fast Wide SCSI (differential) Low Voltage Differential (LVD) |
| Number of cartridges, full magazine | 19 |
| Media type | AIT 8 mm, Advanced Metal Evaporated |
| Number of drives | 1 or 2 |
| Load time | 15 sec (max), including picking from slot |
| Unload time | 15 sec (max), including returning to slot |
| Rewind speed | 160 in/sec |
| Sustained native data transfer rate, maximum | 21.6 to 43.2 GB/hr |
| Native data capacity (full magazine) | 950 GB |
| Compressed data capacity (2:1, full magazine) | 1900 GB |

Table A-2
Reliability Specifications (Drives)

| Description | Specification |
|-------------------------------|-----------------------------|
| Data error rate (recoverable) | 1 in 10^{17} bytes |
| MTBF | 250,000 hr @ 30% duty cycle |
| MTTR | 30 min |
| Head life | 50,000 tape motion hrs |

Table A-3
Reliability Specifications (Library System Robotics)

| Description | Specification |
|---|----------------------|
| Life expectancy, load/unload operations | 1,000,000 cycles |
| Design life | 7 yrs |

Table A-4
Power Specifications

| Description | Specification |
|--------------------|----------------------|
| Voltage | 115 to 240 VAC |
| Current | 1.5 to 1.2 A |
| Line frequency | 47 to 63 Hz |

Table A-5
Mechanical Specifications (Tabletop Model)

| Description | Specification |
|--------------|---------------------|
| Height | 7.9 in (20 cm) |
| Width | 17.3 in (44 cm) |
| Depth: | |
| Overall | 24 in (61 cm) |
| Behind panel | 22.75 in (57.79 cm) |
| Weight: | |
| Single drive | 41 lbs (18.6 kg) |
| Dual drive | 41.5 lbs (18.8 kg) |

Table A-6
Mechanical Specifications (Rackmount Model)

| Description | Specification |
|--------------|---------------------|
| Height | 6.7 in (17 cm) |
| Width | 17.3 in (44 cm) |
| Depth: | |
| Overall | 24 in (61 cm) |
| Behind panel | 22.75 in (57.79 cm) |
| Weight: | |
| Single drive | 41 lbs (18.6 kg) |
| Dual drive | 41.5 lbs (18.8 kg) |

Table A-7
Environmental Specifications (Operating)

| Description | Specification |
|------------------------------------|--|
| Dry bulb temperature | 50°F to 104°F (10°C to 40°C) |
| Temperature gradient | 1.8°F/min (1°C/min) |
| Temperature shock | 27°F (15°C) over 2 min |
| Wet bulb temperature | 78.8°F (26°C) |
| Relative humidity (non-condensing) | 15% to 85% |
| Humidity gradient | 10%/hr |
| Altitude | -100 ft to +10,000 ft (-305 m to 3050 m) |

Table A-8
Environmental Specifications (Packed or Unpacked)

| Description | Specification |
|------------------------------------|--|
| Dry bulb temperature | -40°F to 140°F (-40°C to 60°C) |
| Temperature gradient | 36°F (20°C)/hr (across the range) |
| Temperature shock | 27°F (15°C) (over 2 min) |
| Wet bulb temperature | 86°F (30°C) |
| Relative humidity (non-condensing) | 10% to 95% |
| Humidity gradient | 10%/hr |
| Altitude | -100 ft to +10,000 ft (-305 m to 3050 m) |

Table A-9
Environmental Specifications (Storage/Transit)

| Description | Specification |
|------------------------------------|--|
| Dry bulb temperature | -40°F to 140°F (-40°C to 60°C) |
| Temperature gradient | 45°F (25°C)/hr (across the range) |
| Temperature shock | 27°F (15°C) (over 2 min) |
| Wet bulb temperature | 86°F (30°C) |
| Relative humidity (non-condensing) | 5% to 95% |
| Humidity gradient | 10%/hr |
| Altitude (sea level) | -100 ft to +10,000 ft (-305 m to 3050 m) |

Table A-10
Acoustic Emission Level

| Drive Condition | Emission Level |
|--|----------------|
| Drive in use (Intermittent robot motion excepted) | <50 dBA |

Safety

The Library carries the following Regulatory Agency product safety certifications.

Table A-11
Regulator Agency Product Safety Certifications

| Description | Specification |
|---------------------|--------------------------------------|
| Certification | Standard |
| UL Listed | UL 1950 |
| TUV/Product Service | EN 60 950 |
| GS Mark | |
| CE Mark | EMC Directive, Low Voltage Directive |
| Canadian UL Listed | CSA 22.2 No. 950 |

Electromagnetic Emission (EM)

Notice

This equipment has been tested using double shielded cables for EM compliance. The use of unshielded cables or modifications requires system testing for EMI testing for compliance to the standard.

Industry Canada

This Class A digital apparatus meets all requirements of the Canadian Interference-causing equipment regulations.

Industrie Canada

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

FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

**Table A-12
Acoustic Noise Declaration Declared per ISO 9296 and ISO 7779**

| Product | Sound Power Level L_{wAd} , B | | Sound Pressure Level L_{pAm} , dBA (bystander position) | |
|------------------------|---------------------------------|---------|--|---------|
| | Idle | Operate | Idle | Operate |
| SSL2000 Series Library | 6.4 | 7.0 | 48 | 48 |

NOTE: Current values for specific configurations are available from Compaq representatives 1 B = 10 dBA.

**Table A-13
Schallemissionswerte - Werteangaben nach ISO 9296 und ISO 7779 /DIN EN27779**

| Gerät | Schalleistungspegel L_{wAd} , B | | Schalldruckpegel L_{pAm} , dBA (Bediener position) | |
|------------------------|-----------------------------------|---------|---|---------|
| | Leerlauf | Betrieb | Leerlauf | Betrieb |
| SSL2000 Series Library | 6,4 | 7,0 | 48 | 48 |

NOTE: Aktuelle Werte für spezielle Ausrüstungsstufen sind über die Compaq Vertretungen erhältlich. 1 B = 10 dBA.

FCC and VCCI Requirements

The following FCC and VCCI notices apply to the Library.

Statement for Equipment Meeting FCC Class A Requirements

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) This device must accept any interference that may cause undesirable operation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Equipment Meeting VDE Class B Requirements (VFG 1046/84 and VFG 243/91 for Germany)

Für Bundesrepublik Deutschland
For Federal Republic of Germany
Pour la République fédéral d'Allemagne

Bescheinigung des Herstellers/Importeurs

Dieses Gerät ist Übereinstimmung mit den Bestimmungen der BMPT Vfg. 243/1991 und Vfg. 46/1992 in Verbindung mit EN55022:1987 (DIN VDE 0878-3:11.89) oder Vfg. 1046/1984 mit Vfg. 483/1986, funktentstört. Es trägt als Nachweis der EMV-Konformität entweder eine Konformitätskennzeichnung oder das freiwillige VDE-Funkschutzzeichen.

Der vorschriftsmäßige Betrieb mancher Geräte (z.B. Meßsender) kann allerdings gewissen Einschränkungen unterliegen. Beachten Sie deshalb die unten aufgeführten Hinweise.

Für Geräte die nicht mit dem VDE-Funkschutzzeichen versehen sind wurde dem Bundesamt für Zulassungen in der Telekommunikation (BZT) des Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung Zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Betreiberhinweis

Wir sind verpflichtet, Sie auf folgende Fakten hinzuweisen (BMPT-Amtsblattverfügung 243/91 bzw. 1046/84 §2, Abschnitt 5):

Dieses Gerät wurde funktechnisch sorgfältig entstört und geprüft. Wird deises Gerät innerhalb einer Anlage zusammen mit anderen Geräten betrieben, muß bei Inanspruchnahme der "Allgemeinen Betriebsgenehmigung" nach BMPT-AmtsblVfg. 243/91 bzw. 1046/84 die gesamte Anlage den unter §2, Abschnitt 1, genannten Voraussetzungen entsprechen.

Externe Datenkabel:

Sollte ein Austausch der von Digital spezifizierten Datenkabel nötig werden, muß der Betreiber für eine einwandfreie Funkentstörung sicherstellen, daß Austausch kabel im Aufbau und Abschirmqualität dem Compaq Originalkabel entsprechen.

VCCI Notice for Japan Class I Equipment

Japanese Voluntary Control Council for Interference (VCCI).

この装置は、第一種情報処理装置（商工業地域において使用されるべき情報処理装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。
従って、住宅地域またはその隣接した地域で使用すると、ラジオ、テレビジョン受信機等に受信障害を与えることがあります。
取扱説明書に従って正しい取り扱いをして下さい。

This equipment is in the 1st Class category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment aimed at preventing radio interference in commercial and/or industrial areas.

Consequently, when used in a residential area or in an area adjacent thereto, radio interference may be caused to radios and TV receivers, and so on. Read the instructions for correct handling.

Appendix **B**

FRUs, Spares, and Accessories

Introduction

This appendix lists the FRUs, spares, and accessories that are available for the Compaq StorageWorks SSL2000 Series Library.

Table B-1
FRUs, Spares, and Accessories

| Description | Part Number |
|--------------------------------------|-------------|
| SPS-DRV, 50 GB, AIT, Library | 192988-001 |
| SPS-BD with Shuttle | 180751-001 |
| SPS-BD, LVD/SE Control | 180752-001 |
| SPS-Panel, Front, with Control Panel | 180753-001 |
| SPS-Switch, Power | 180754-001 |
| SPS-Receptacle, AC | 180755-001 |
| SPS-CA, Motor Flex 6 Conductor | 180756-001 |
| SPS-CA, Motor Flex Tach 6 Conductor | 180757-001 |
| SPS-CA, Shuttle Flex 30 Conductor | 180758-001 |
| SPS-Switch, Door Sensor | 180759-001 |
| SPS-CA, Serial Harness | 180760-001 |
| SPS-CA, SCSI Control0 Drive LVD | 180761-001 |
| SPS-CA, SCSI Control1 Drive LVD | 180762-001 |
| SPS-CA, Split Power Harness | 180763-001 |
| SPS-CA, 15-inch Opto Sensor Harness | 180764-001 |

continued

Table B-1
FRUs, Spares, and Accessories *continued*

| Description | Part Number |
|--|-------------|
| SPS-CA, Control Panel | 180765-001 |
| SPS-CA, Power Harness with Ground | 180766-001 |
| SPS-CA, Power Harness Extension | 180767-001 |
| SPS-Solenoid | 180768-001 |
| SPS-Power Supply, Library | 187232-001 |
| SPS-Magazine, AIT Library | 189934-001 |
| SPS-Bar Code Reader | 192125-001 |
| SPS-CA, Patch, RJ45, M/M, 3 Foot | 195211-001 |
| SPS-Fan | 124127-001 |
| SPS-Mechanism, Pass-Through with Transport | 199939-001 |
| SPS-Mechanism, Pass-Through with Extender | 199940-001 |
| SPS-PTM, Belt Kit | 201826-001 |

Appendix C

Installation

Introduction

This appendix describes how to install the Compaq StorageWorks SSL2000 Series Library (AIT Library), including:

- Unpacking
- Releasing the lockdown mechanism
- Setting up desktop and rackmount models
- Installing and removing the Pass-Through Mechanism (PTM)
- Adding a PTM extrusion that includes:
 - Removing and replacing the elevator car
 - Removing the bottom pulley assembly
 - Installing a new belt
- Setting up interfaces and cables
- Cabling the PTM and multi-unit Library system
- Configuring the Library
- Configuring a Library system
- Setting up reserved slots
- Configuration options and settings

Unpacking

Unpack the Library and place it in the desired physical location. Save the packing materials for reuse in case you need to send the unit to Compaq for repairs.

Releasing the Lockdown Mechanism

If you have not done so, release the lockdown mechanism on the Library using the lockdown screw at the back of the unit (Figure C-1).

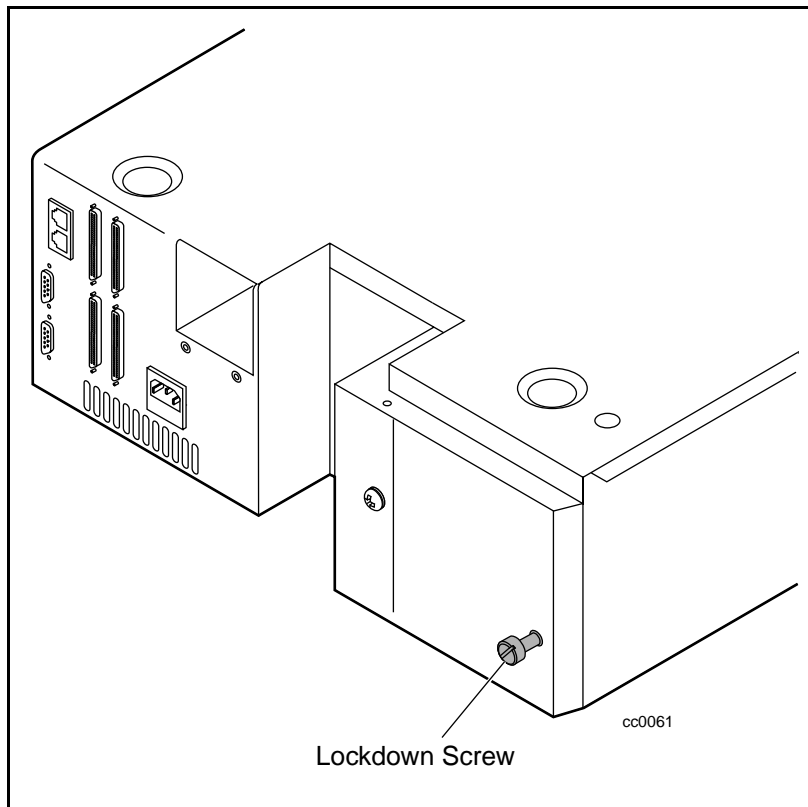


Figure C-1. Lockdown mechanism screw

To release the lockdown mechanism:

1. Turn off the unit and then disconnect the power cord from the AC power source.
2. If necessary, reposition the unit for easier access to the back panel.
3. Turn the spring-loaded lockdown screw at the back of the unit counter-clockwise. The screw pops out and the lockdown mechanism releases from the shuttle (Figure C-2).
4. Connect AC power and then turn the unit power on.

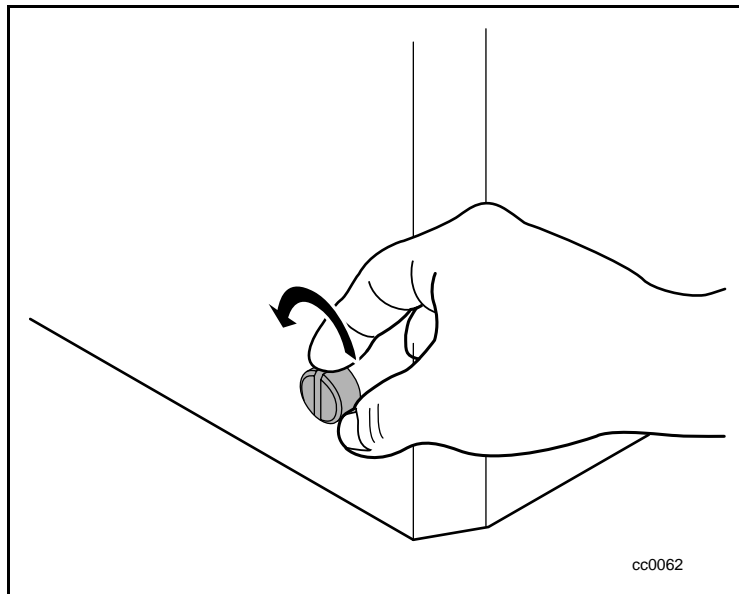


Figure C-2. Releasing the lockdown mechanism

To lock the lockdown mechanism:

1. Park the shuttle assembly by selecting the Maintenance menu and then *Park* from the Main menu.

NOTE: The shuttle assembly moves to its home position, bringing the threaded hole into alignment with the lockdown screw.

2. Turn off the unit.
3. Disconnect the power cord from the AC power source.
4. If necessary, reposition the unit for easier access to the back panel.
5. Push in on the spring-loaded lockdown screw at the back of the unit and turn it clockwise (Figure C-3). This secures the shuttle to a bracket and locks it in place.

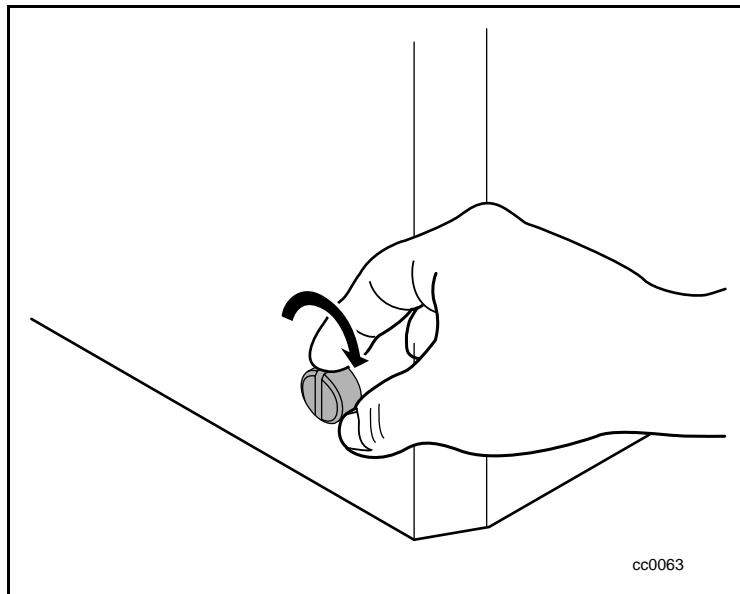


Figure C-3. Locking the lockdown mechanism

Setting up the Desktop Model

The Library tabletop model requires no mechanical assembly for mounting. Place the unit on a desk, table, server top, or other stable, horizontal surface. Make sure the cooling grilles at the rear of the unit are not obstructed. Allow 2 in (5 cm) of clearance behind the rear panel.

Setting up the Rackmount Model

To convert a tabletop Library to a rackmount model, order the Compaq Conversion Kit, part number 175199-B21.

Precaution

If you do mount the Library in a storage cabinet, be sure to take the following precautions:



CAUTION: Before moving and installing a Library into a storage cabinet, make sure that the robot is parked (using the control panel) and the lockdown mechanism is locked.



CAUTION: To prevent tipping, never slide units out of the storage cabinet so that more than 57 lb (226 kg) or 20% of the total storage cabinet weight is extended at any time.

Removing the Desktop Outside Cover

Before installing the Library into a storage cabinet, you first remove the desktop outside cover (see Figure C-4). To remove the outside cover:

1. Turn off power to the Library and then unplug it from the AC power source.
2. Remove the four screws that secure the outside cover to the unit.
3. Slide the outside cover toward the rear of the unit until it clears the lip behind the front panel.
4. Lift the outside cover up and away from the unit.
5. Save the hardware.

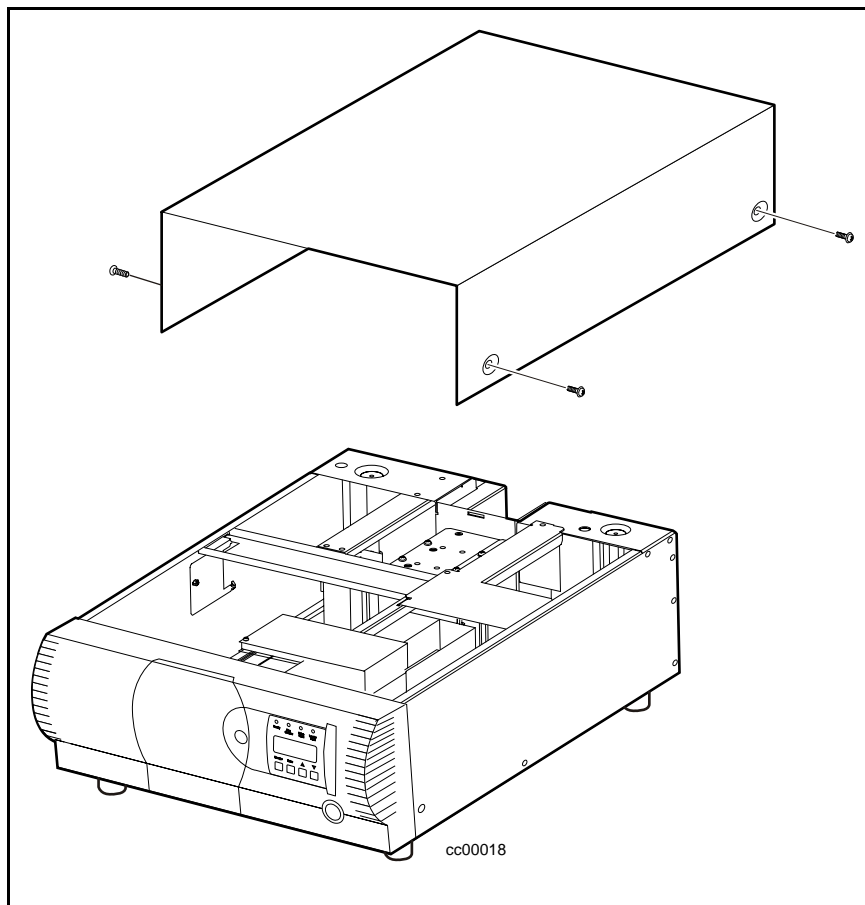


Figure C-4. Removing the desktop outside cover

Installing the Rackmount Top Cover

Install the rackmount top cover to protect the internal components of the Library prior to mounting it into a storage cabinet (see Figure C-5). To install the rackmount top cover:

1. Place the top cover over the Library with each side flange facing to the outside of the unit.
2. Slide the top cover forward until it is flush with the front panel.
3. Secure the top cover to the Library using two screws (see Figure C-5).
4. Remove the rubber feet.

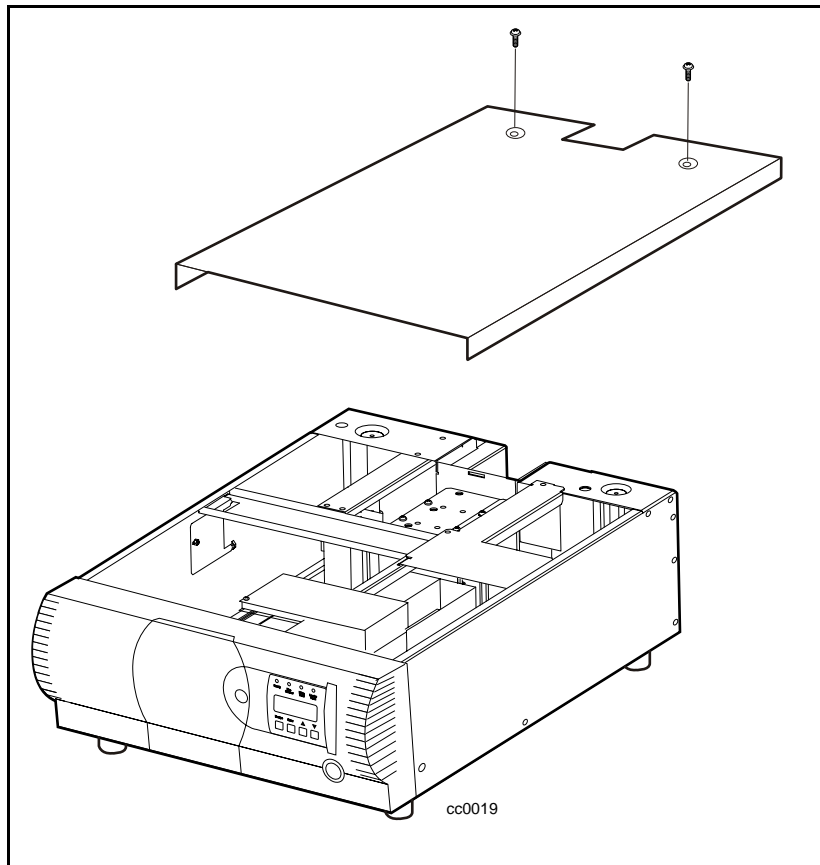


Figure C-5. Installing the rackmount top cover

Installing the Inner Slide Members

Attach an inner slide member to both sides of the Library using the following procedures. Make sure you attach each inner slide member of the rackmount slide assembly to the Library first and then each middle and outer slide members to the storage cabinet. To attach the inner slide members to the Library:

NOTE: The left and right slides are the same so there is no risk of confusing the parts upon reassembly.

1. Identify the parts of the rackmount slide assembly (see Figure C-6 and Table C-1).

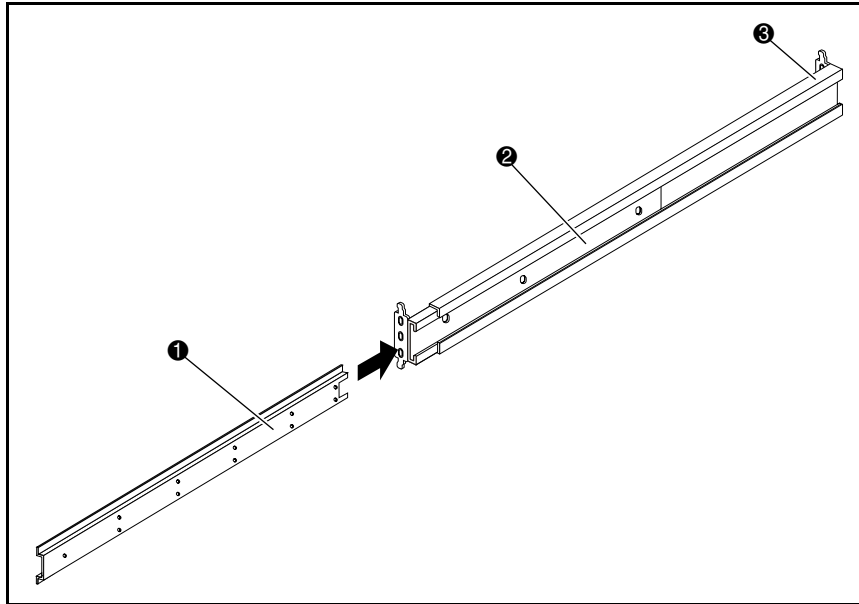


Figure C-6. Rackmount slide parts

Table C-1
Rackmount Slide Parts

| Figure Legend | Description |
|---------------|--|
| ① | Inner slide member |
| ② | Middle slide member |
| ③ | Outer slide member |
| ④ | Pass-through channel mounting bracket (P/N 968482-101) |
| ⑤ | Mounting screws |

2. Remove each inner member from each rackmount slide assembly.
3. Attach both inner members to the Library sides. Use six pan-head screws (three each side) inserted through the upper row of holes in each inner member (see Figure C-7).

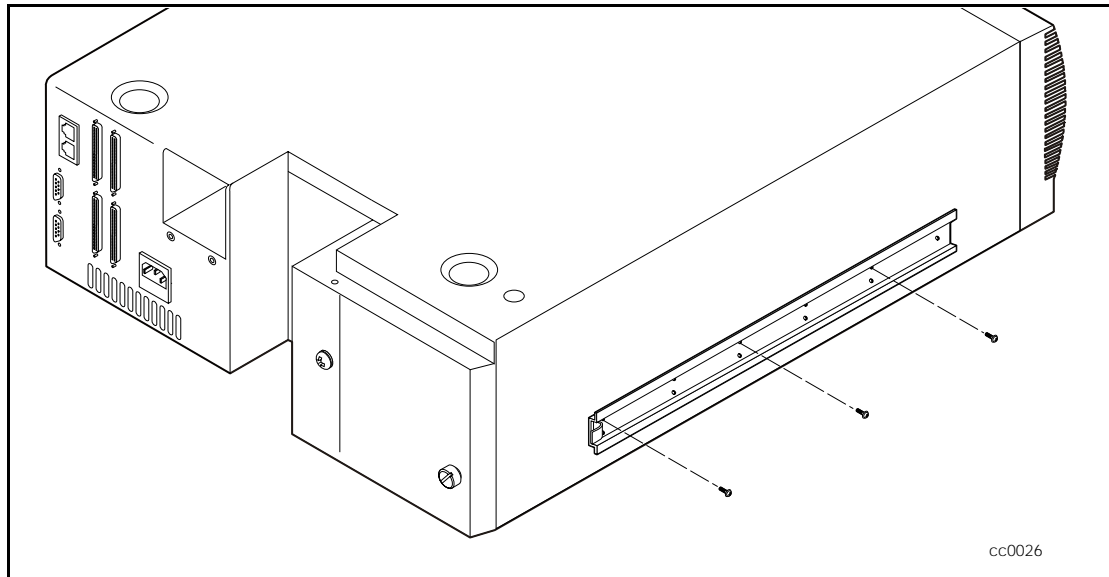


Figure C-7. Installing the inner slides

Installing the Panel Extensions

NOTE: The left and right slides are the same so there is no risk of confusing the parts upon reassembly.

1. Place a panel extension against one side of the Library so that the holes in the panel extension are aligned with the two holes in the chassis (see Figure C-8).

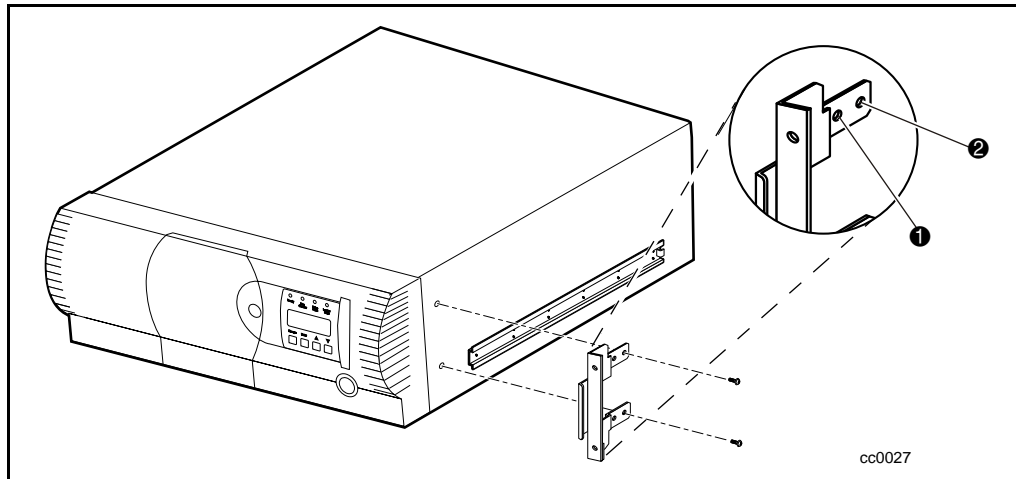


Figure C-8. Installing the panel extension

2. Install two screws through the holes in the panel extension into the Library.

NOTE: The panel extension has two pairs of mounting holes. Use the forward pair for the regular mounting position (❶ Figure C-8). Regular mounting leaves the curved front panel surface extending outward from the front of the storage cabinet. The rear pair of holes permit a flush mount position that leaves the front panel recessed into the storage cabinet (❷ Figure C-8). You might choose flush mounting if, for example, you have storage cabinet doors that would be hindered by the protruding front panel.

3. Repeat steps 1 and 2 for the other side of the Library.

Installing the Rackmount Model into a Storage Cabinet

1. With the inner slide members attached to the Library, install the middle and outer slide members to the storage cabinet, following the installation instructions in the *Compaq Rack Planning Guide*.
2. Using two people, lift the Library and visually align the inner and middle slide members. Carefully insert the Library's inner slide members into the extended middle slide members.
3. Slide the Library completely into the storage cabinet until the front panel touches it.
4. Secure the front panel to the storage cabinet using the supplied screws and cage nuts.

Installing and Removing the PTM

This section describes how to install and remove the PTM. The PTM enables the transfer of a single tape cartridge between two or more Compaq StorageWorks SSL2000 Series Libraries. The PTM can be used to connect up to five Libraries increasing the storage capacity of the entire library system.

Installing a Pre-Assembled PTM

To install a pre-assembled PTM:

1. Access the rear panels of the Library units in the storage cabinet and disconnect each one from its AC power source.
2. Loosen the screws that secure the Library unit's mounting ears to the front of the storage cabinet. Loosen the screws just enough to allow the Library units to move slightly in and out.

NOTE: Refer to the *Compaq Rack Planning Guide* for specific installation instructions.

3. Loosen the rear slide screws so that the Library units float freely in the storage cabinet.
4. Establish the nominal (midpoint) vertical position for the master unit and then tighten its rear slide screws.

5. Remove the retaining screw ② that secures the PTM port cover ① to the rear of each Library unit (see Figure C-9).

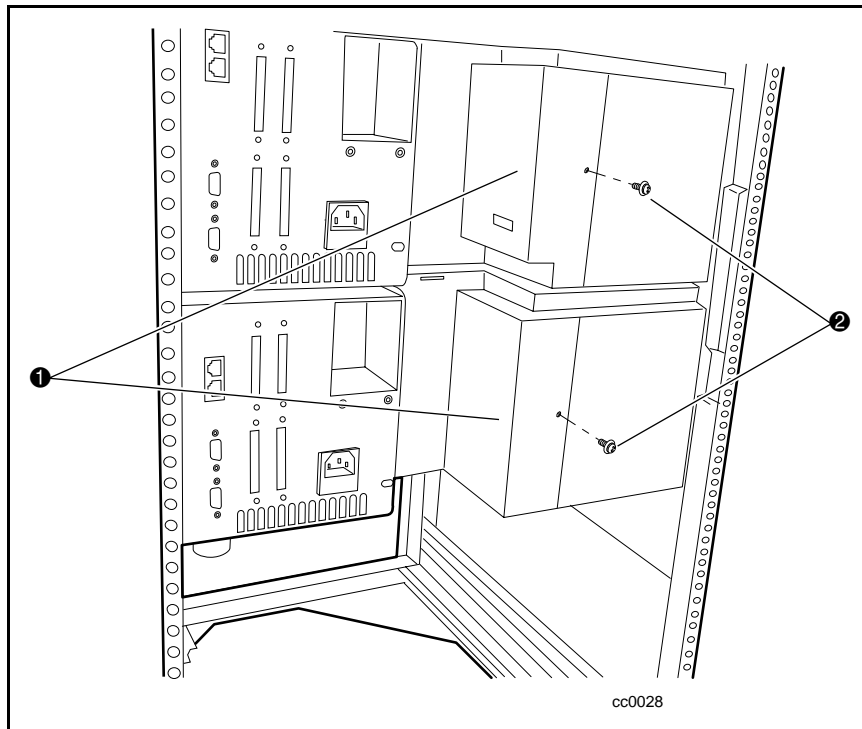


Figure C-9. Removing the PTM port cover

6. Holding the PTM upright, position it against the rear panels so that the PTM motor housing assembly ❶ slides into the available space and the two pilot pins ❸ on the extrusion mate with the holes ❷ in the rear of the top Library unit (see Figure C-10).

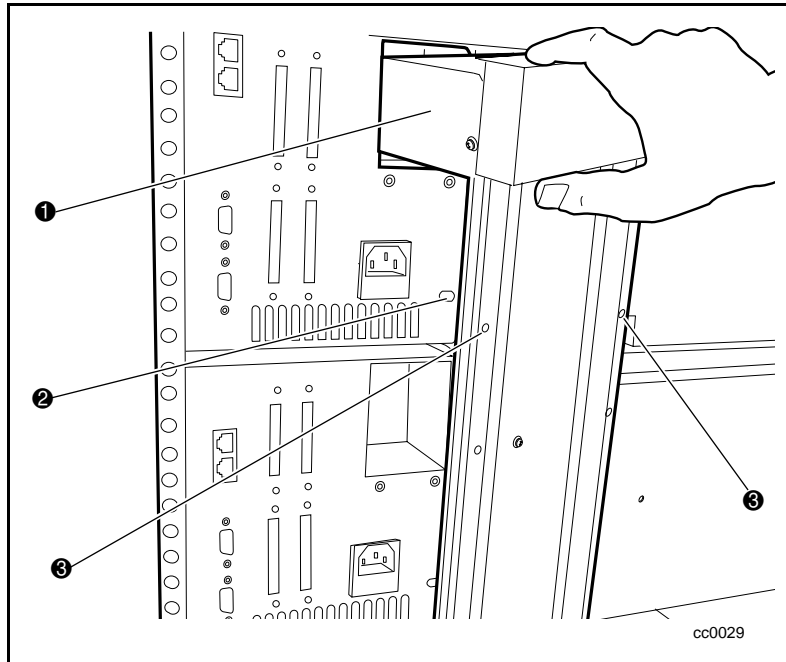


Figure C-10. Installing the PTM

7. Attach the PTM to the master (top) unit using two bullet-nose thumbscrews ❶ and washers through the top two holes in the extrusion (see Figure C-11). Do not fully tighten the thumbscrews at this time.

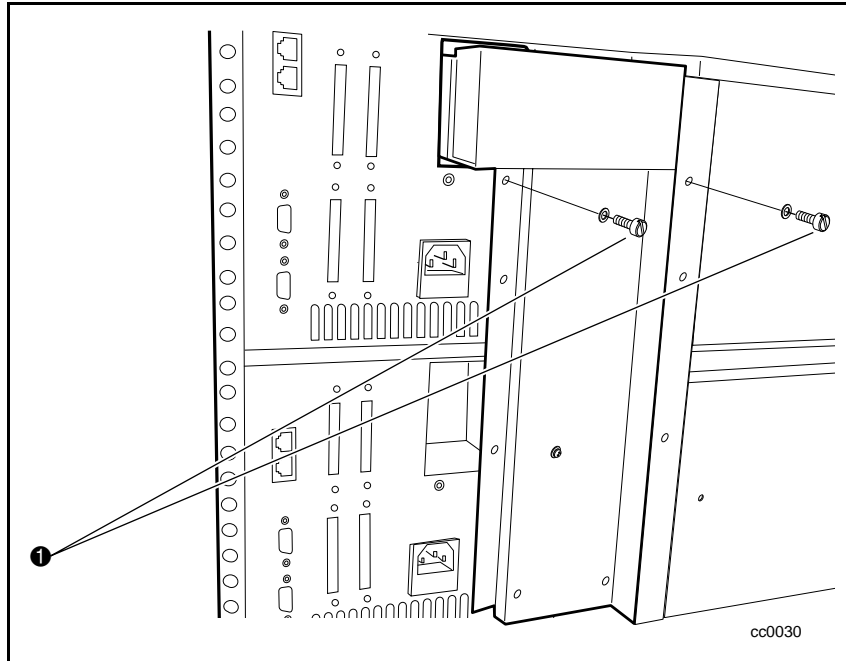


Figure C-11. Securing the PTM to the master unit

- Align the two holes on the extrusion with mounting holes on the slave unit and attach the PTM in place using two bullet-nose thumbscrews and washers (❶ Figure C-12). Do not fully tighten the thumbscrews at this time.

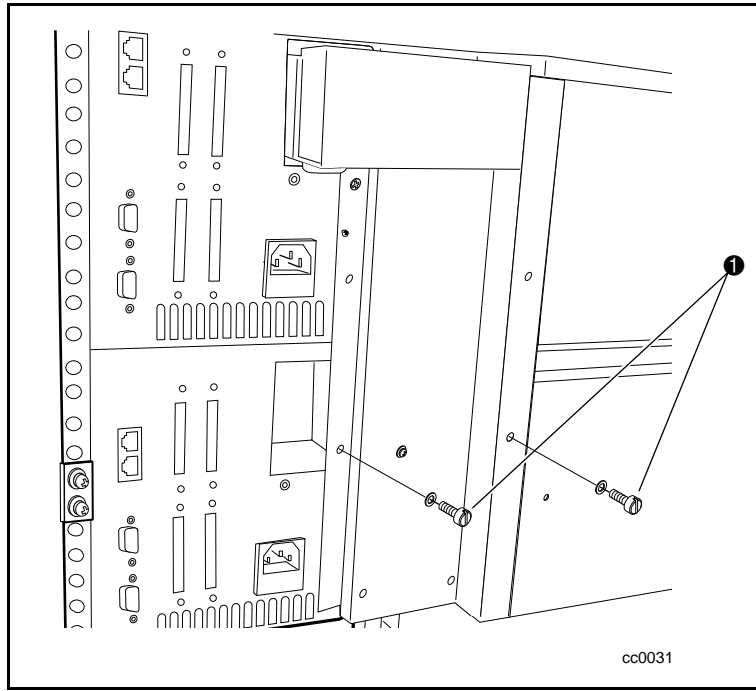


Figure C-12. Securing the PTM to the slave unit

NOTE: If a screw hole is offset, push the slave unit slightly forward to make a gap between it and the channel. This lets you start threading the thumbscrews into the slave unit.

- Repeat Steps 7 through 9 for each additional slave unit. Do not fully tighten the thumbscrews at this time.
- Tighten all rear storage cabinet slide screws.
- Tighten all PTM thumbscrews.
- Tighten all screws that secure the Library unit's mounting ears to the front of the storage cabinet.
- Attach all power and communication cables. See "Cabling the PTM and Multi-Unit Library System," described later in this appendix.

Removing a PTM

To remove a PTM:

1. Access the rear panels of the Library units in the storage cabinet and disconnect each one from its AC power source.
2. Unplug the motor control cable from its connector on the PTM motor housing assembly (see Figure C-13).
3. If the master unit (top) is to be removed for service, disconnect the motor cable and plug it into the unit directly below it (slave 0). Reconfigure slave 0 to be the master unit and slave 1 to be slave 0, slave 2 to be slave 1, and so forth (see Figure 3-5).

NOTE: After installation, there are software ramifications in changing a Library's configuration and should only be done if necessary.

4. Disconnect the RJ45 cable from the unit to be removed or serviced and then plug it into the next unit so all units remain in series.

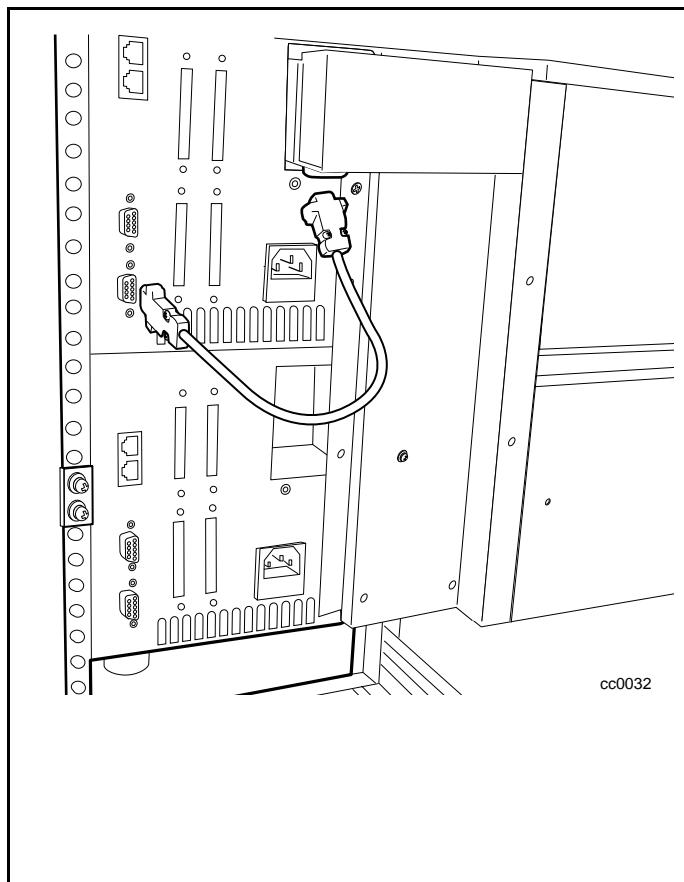


Figure C-13. Unplugging the PTM motor housing assembly control cable

5. Remove the bullet-nose thumbscrews and washers (two per unit) that secure the PTM to the Library units (see Figure C-11 and Figure C-12).
6. Gently pull the PTM out and away from the Library units.

Adding a PTM Extrusion

This section describes how to add an extrusion to extend the PTM. To add an extrusion, you must first remove the PTM, the elevator car, and the bottom pulley assembly.

To add an expansion module:

1. Remove the PTM (if already installed).
2. Remove the elevator car (described later in this section).
3. Remove the bottom pulley assembly (described later in this section).
4. Move the location stop pin to the lowest PTM extrusion (❶ Figure C-14).

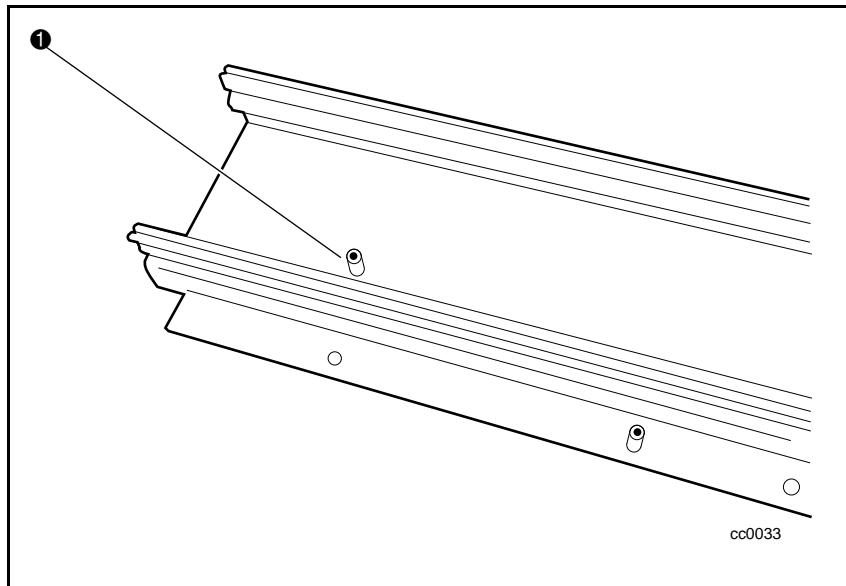


Figure C-14. Location stop pin

5. Attach the tie bars with the screws to the PTM extrusion, making sure that the beveled edges of the tie bars are oriented as shown in (1) Figure C-15). Use flat-head screws on the sides and pan-head screws at the rear.

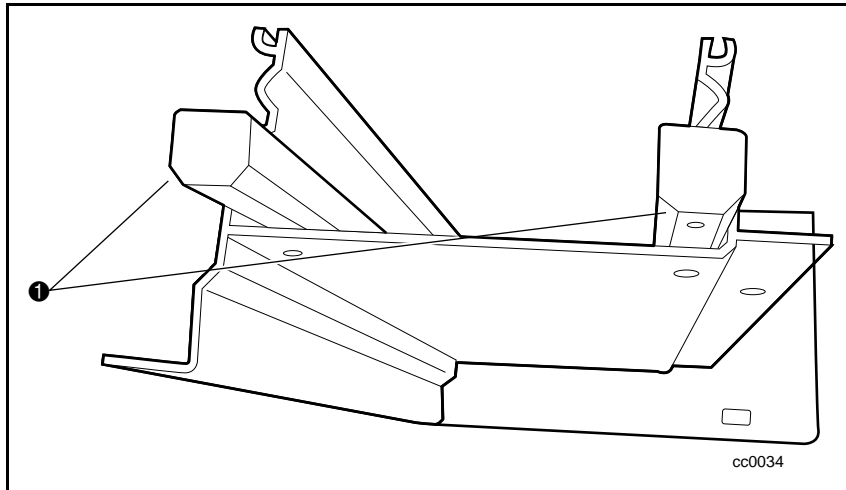


Figure C-15. Attaching tie bars

6. Insert the tie bars (now mounted on the main PTM extrusion (1)) into the extension (2), aligning the two PTM extrusions so that the channel patterns match (see Figure C-16).

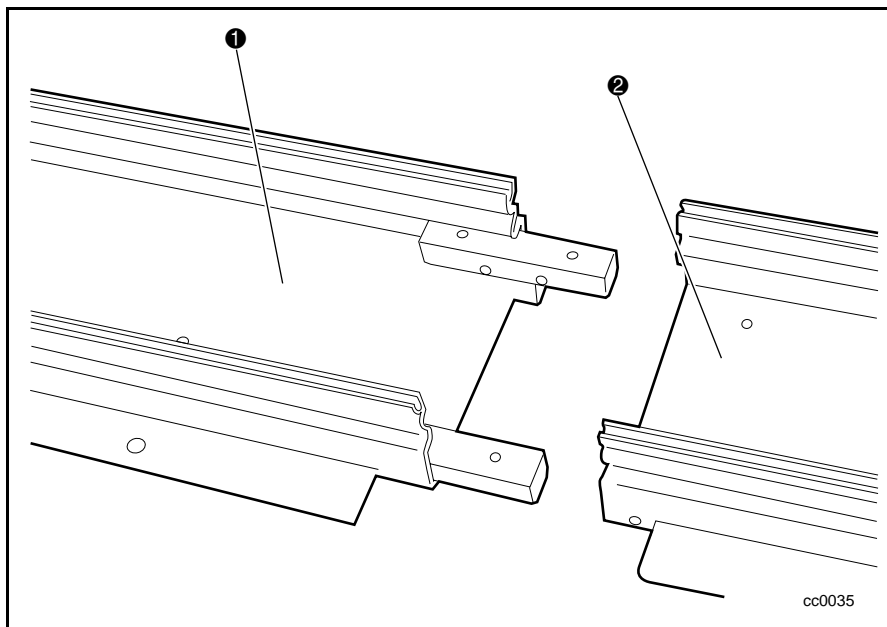


Figure C-16. Attaching PTM extrusions

7. Attach the tie bars to the PTM extrusions using four screws (two each side). See Figure C-17.
8. Move location stop pin to lowest PTM extrusion (● Figure C-14).

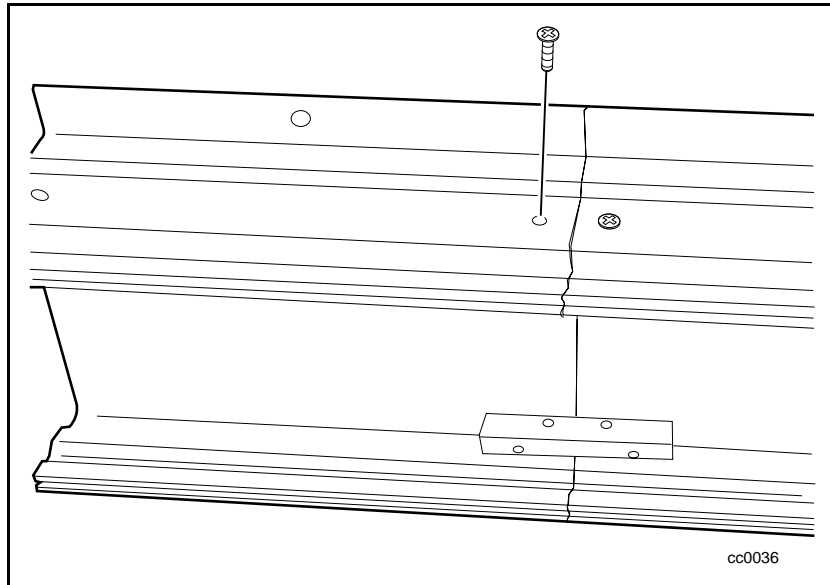


Figure C-17. Attaching tie bars to the PTM extension

Installing a New Belt

1. Obtain a belt from extension kit and then cut it to the appropriate length (see Figure C-18).

NOTE: A new full-length belt is marked 2, 3, 4, and so forth indicating where to cut per number of Library units the PTM will service.

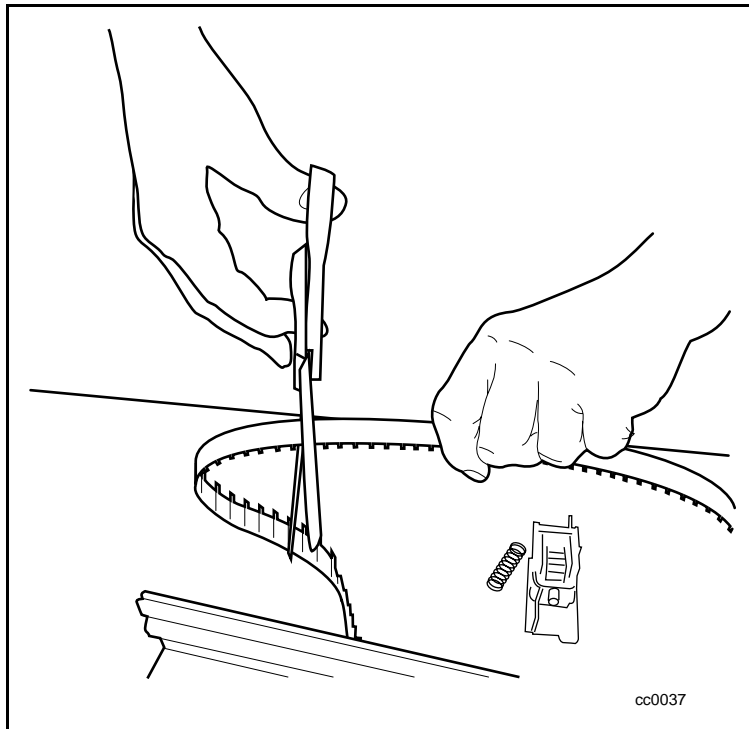


Figure C-18. Cutting the belt

NOTE: The belt included with your kit accommodates up to four PTM extrusions. The belt is marked at numbered intervals, indicating the exact length needed for your Library system.

| Number of Extrusions | Length of Belt |
|----------------------|----------------|
| 2 | 27 inches |
| 3 | 41 inches |
| 4 | 55 inches |

2. Thread the belt through the bottom pulley. Note the orientation of the belt teeth and the location stop pin (❶ Figure C-19).
3. Thread the belt through the top pulley.

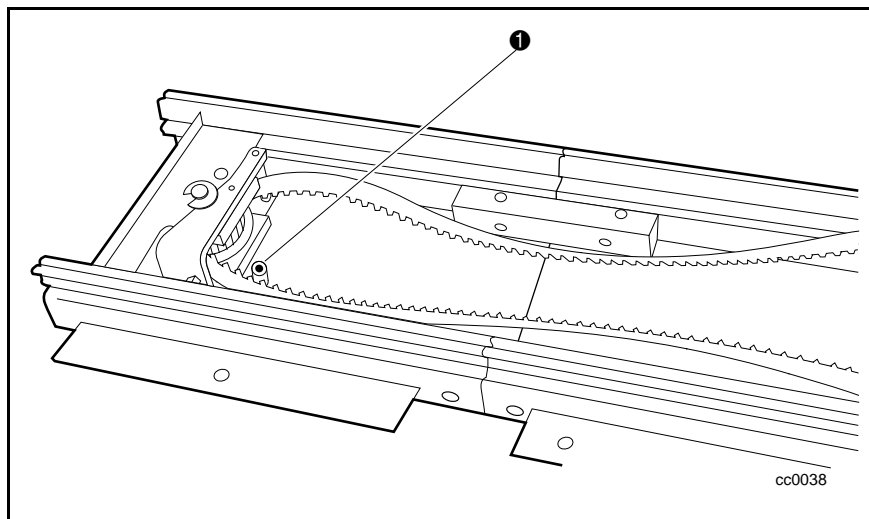


Figure C-19. Threading the belt through the pulleys

4. Attach the belt clamp bracket to the belt on the side closest to the PTM motor housing assembly. Make sure one tooth of the belt fits tight in the space in the bracket (❶ Figure C-20).

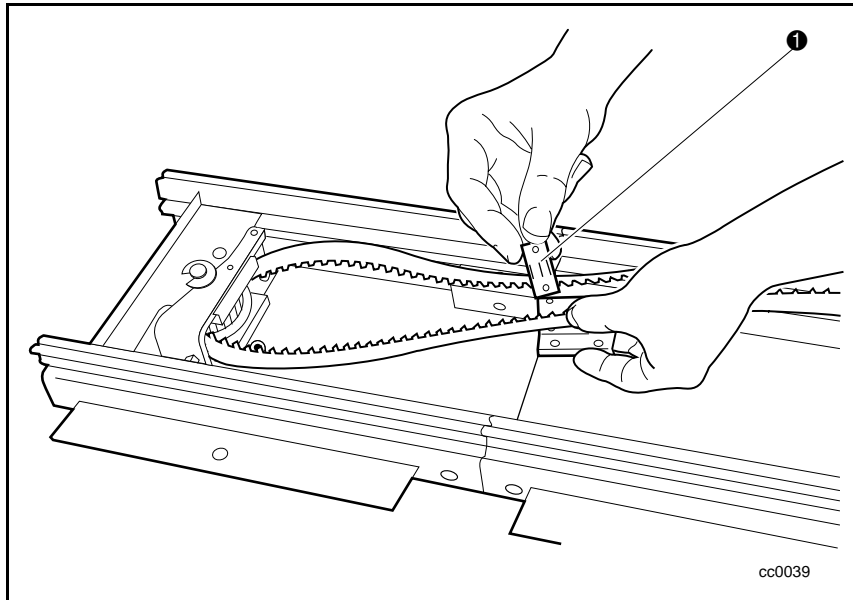


Figure C-20. Attaching the belt clamp bracket

5. Replace the bottom pulley end cap, securing it with self-tapping screws on both sides (❶ Figure C-21).

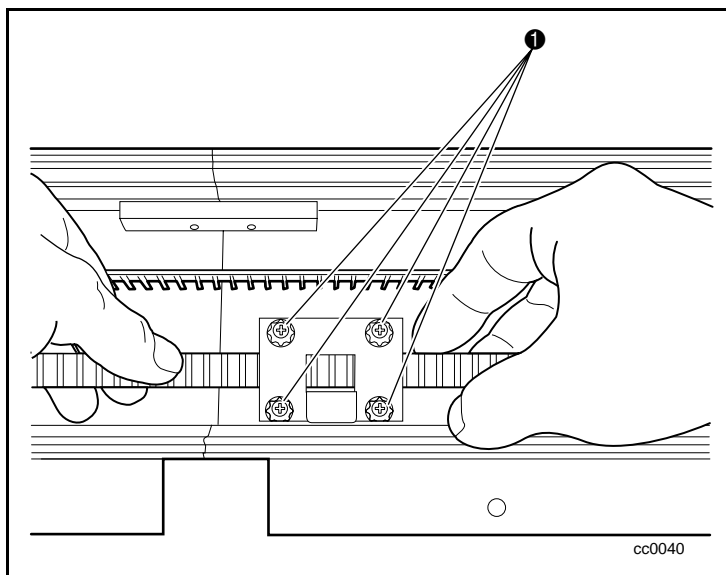


Figure C-21. Replacing the bottom pulley end cap

6. Slide the spring over the tension post and then snap into place so that it rests squarely against the inside of the PTM track (❶ Figure C-22).

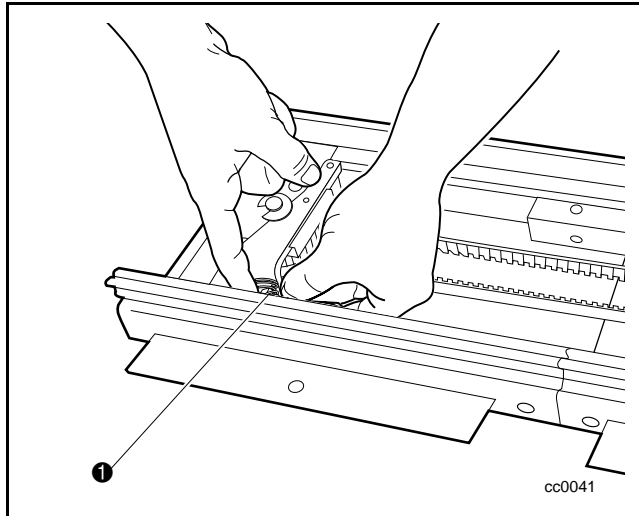


Figure C-22. Snapping the spring over the tension post

Removing the Elevator Car

1. Lay the PTM on a flat surface with the elevator car facing you (see Figure C-23).

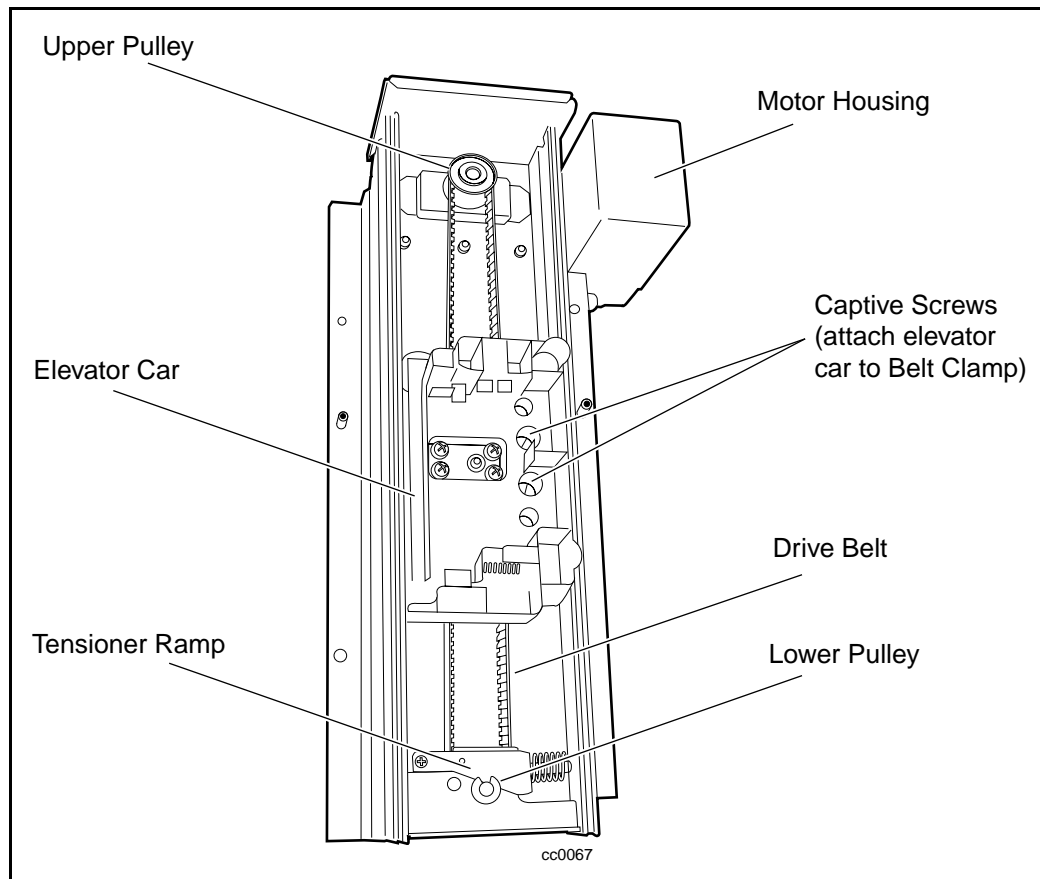


Figure C-23. PTM layout

2. Remove the two screws that secure the elevator car to the belt clamp bracket (❶ Figure C-24).

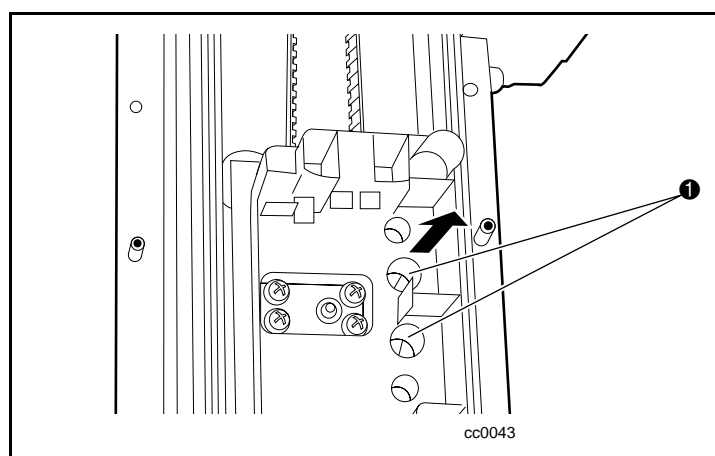


Figure C-24. Releasing the elevator car

3. Press against the elevator springs to disengage the wheels from the PTM extrusion channel (see Figure C-25).
4. Tilt the elevator to disengage the other pair of wheels.

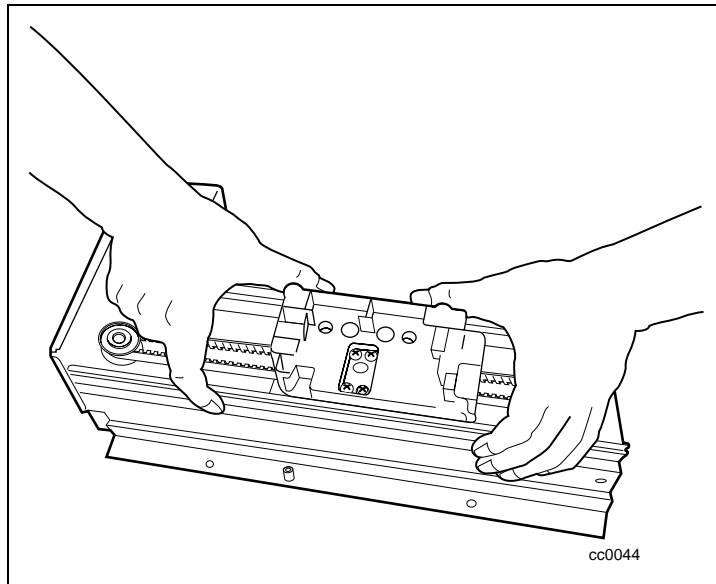


Figure C-25. Disengaging the wheels

5. Lift the elevator car out of the PTM extrusion.

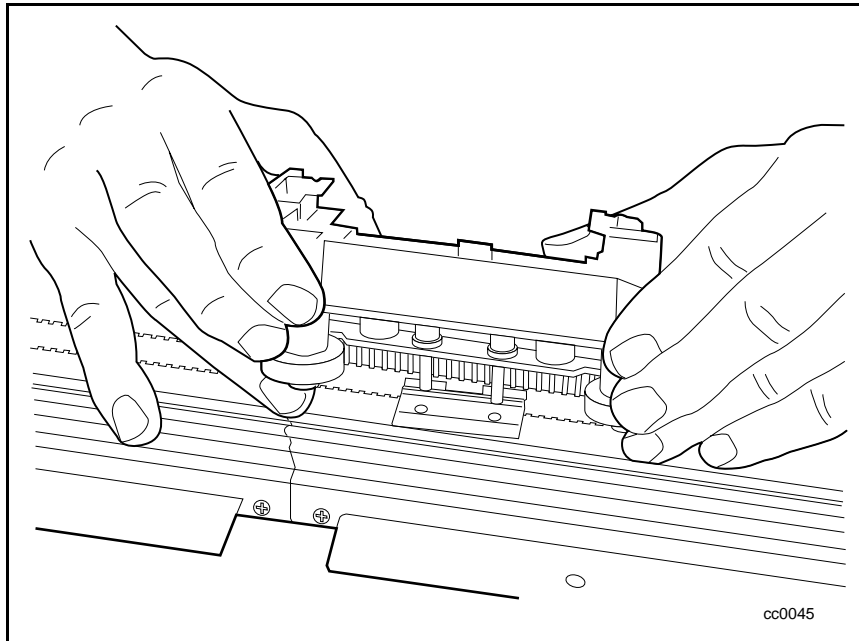


Figure C-26. Removing the elevator car

Replacing the Elevator Car

1. Position the belt clamp midway along the PTM. Place the elevator car into the PTM extrusion, over the belt clamp, engaging both pairs of wheels into the PTM extrusion channel. The wheels of the elevator car should ride in the "V" grooves of the PTM extrusion channel. The cartridge opening on the elevator car should face away from the PTM motor housing assembly (see Figure C-25).
2. Replace and tighten the two captive screws that secure the elevator car to the belt clamp bracket (see Figure C-24).

Removing the Bottom Pulley Assembly

1. Push on the belt tensioner ramp to align its small hole with the hole in the bottom pulley assembly (❶ Figure C-27).

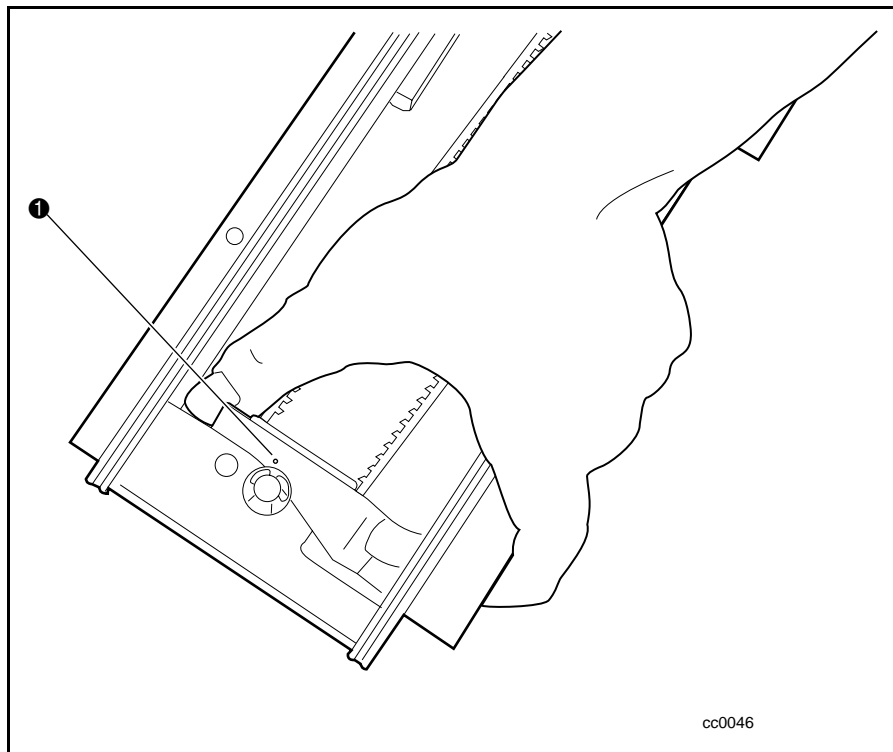


Figure C-27. Aligning the belt tensioner ramp

2. Insert a paper clip in the hole so that it removes tension from the belt and then leave it in place while completing the procedure (see Figure C-28).

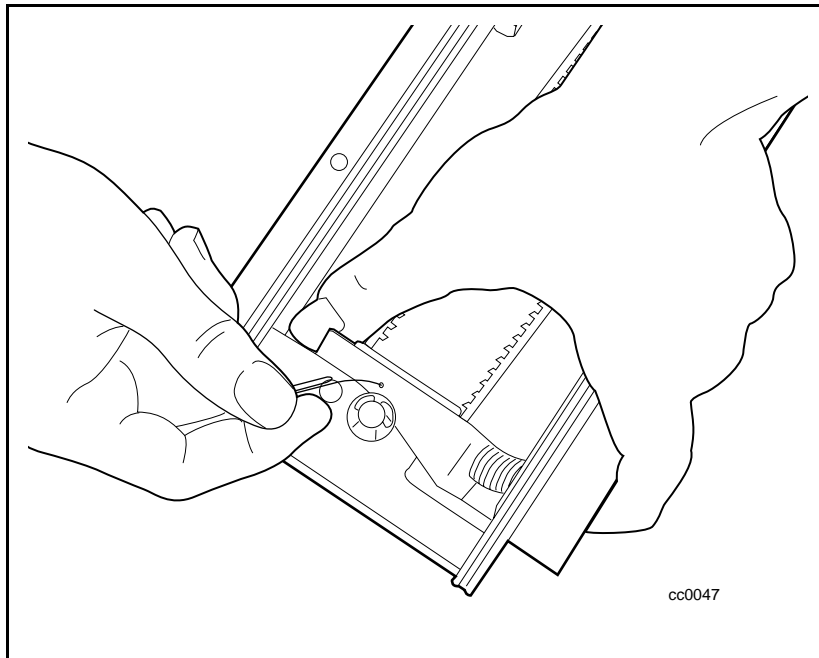


Figure C-28. Removing tension from the belt

3. Loosen the retaining screws to remove the two belt clamp plates (see Figure C-21).
4. Remove the belt from the PTM.

5. Remove the screws on both sides of the bottom pulley assembly (❶ Figure C-29).

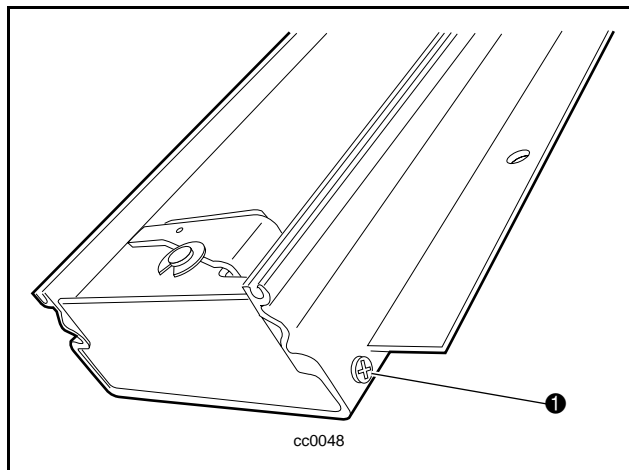


Figure C-29. Releasing the bottom pulley assembly

6. Slide the bottom pulley assembly ❶ out of the PTM extrusion ❷ (see Figure C-30).

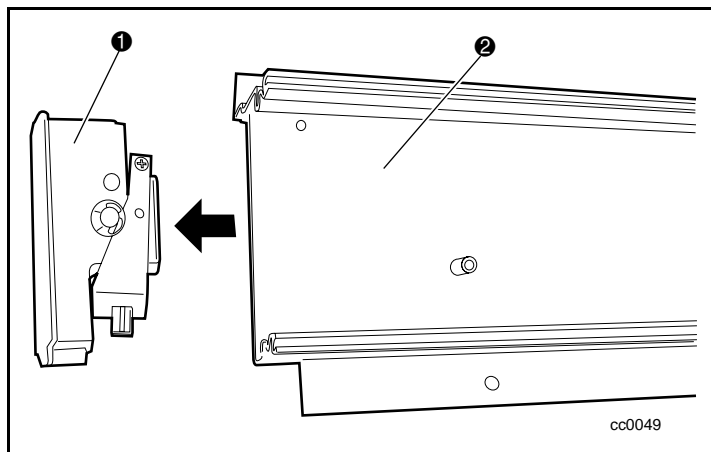


Figure C-30. Removing the bottom pulley assembly

Setting up Interfaces and Cables

The following sections describe the cables required for each of the connectors at the rear panel (see Figure C-31).

See section “Cabling the PTM and Multi-Unit Library System” for detailed information on how to connect cables to the PTM motor housing assembly and Library units.

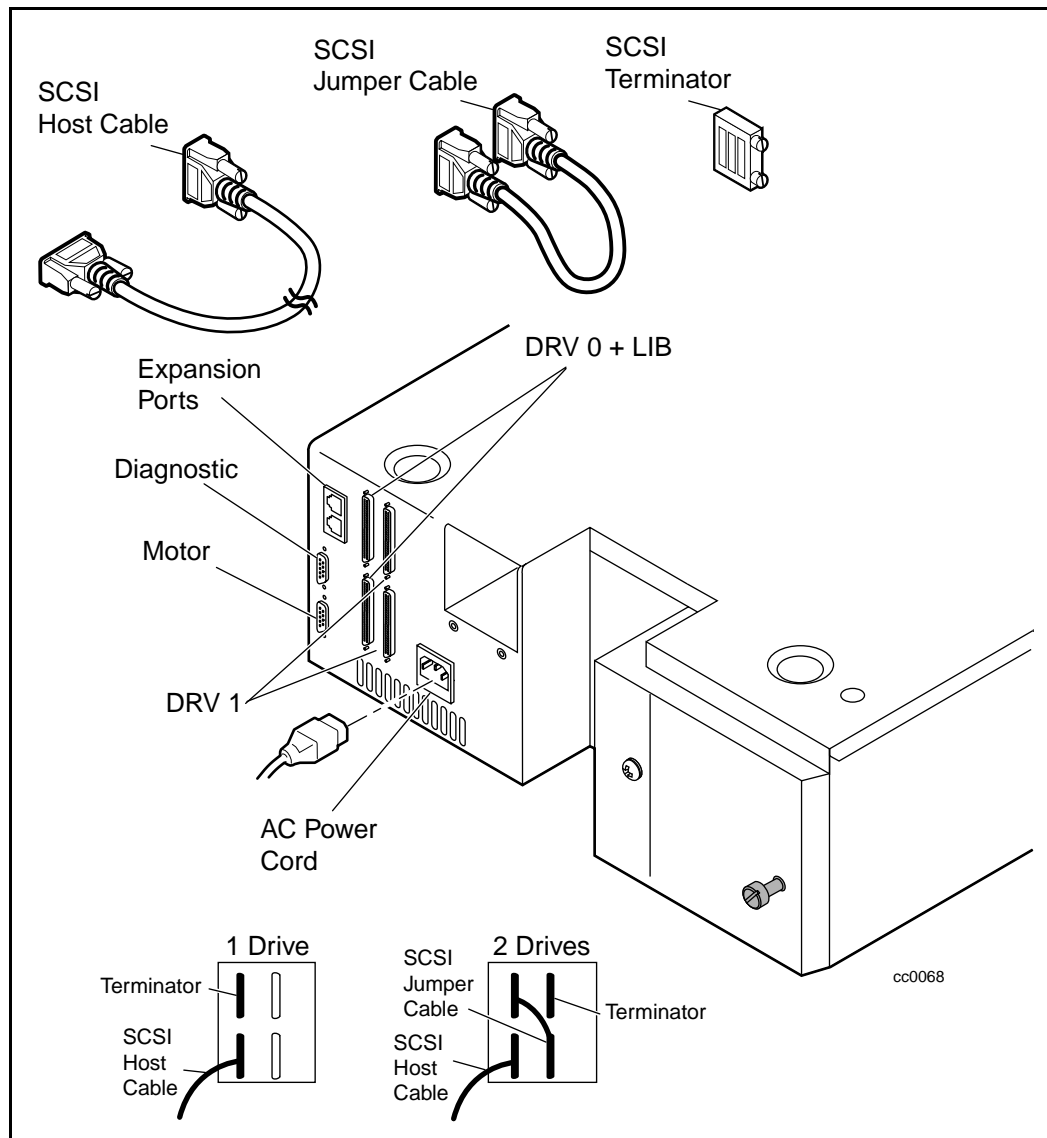


Figure C-31. Connectors, SCSI terminator, and cables

Power Cord Connector

The power cord connector is an IEC-compatible connector at the rear panel. Connect a standard grounding AC cord to the connector on the Library, and connect the other end to a reliably grounded AC outlet or to a storage cabinet power outlet.

To maintain safety compliance, use an approved power cord:

- United States — UL listed
- Canada — CSA certified
- Europe — Harmonized marked <HAR> or nationally certified

SCSI Interface Connectors

The Library is equipped with a Low Voltage Differential/Single-Ended (LVD/SE) SCSI interface.

NOTE: If your Library is used on a single-ended SCSI bus, the internal wiring length of any rackmounted SCSI system can approach the maximum length specification of a single-ended SCSI bus. You must locate the storage cabinet close to the host computer to avoid excessive bus length. It is also especially important in single-ended systems to use the highest quality SCSI cables. Bus errors caused by excessive length or poor quality cables can significantly degrade performance and reliability.

NOTE: For those two-drive applications where both AIT drives run in SCSI-SE mode (rather than LVD mode), each drive must be connected to its own SCSI bus.

Each drive is wired to an independent bus, with a pair of SCSI connectors. Drive 0 shares a SCSI bus with the Library's robotics. To fully use the bus bandwidth, connect all the SCSI buses together as shown in Figure C-31. The insets in Figure C-31 show how to connect the SCSI cable, the jumper cables, and the terminator for one or two-drive units.

Each of the drives in the Library and the robotics is a separate SCSI device. When any two or more devices are connected to the same SCSI bus, each separate SCSI device must be assigned a unique SCSI address. For information on assigning SCSI addresses, see "Configuration," later in this appendix.

To connect a Library to a host computer, the host must have at least one Wide SCSI controller and the appropriate driver software. The controller must be LVD/SE or differential, as required to match the unit interface.

Interface Cable Specifications

The Library is a high-performance system. To avoid degradation of performance, use the highest-quality interface cables from a reputable manufacturer of computer cables. All SCSI cables used with the Library should meet the following requirements:

- Shielded or double-shielded, as required to meet EMI specifications
- Impedance match with cable terminators that meet current SCSI specifications
- Characteristic impedance between 115 and 160 ohms for differential
- 34-pair twisted-pair
- Each end of a twisted pair ground connected to chassis ground
- Maximum cable length of 10 ft (3 m) for a single-ended Fast/Wide SCSI bus, including the internal wiring of SCSI device
- Maximum cable length of 82 ft (25 m) for a differential Fast-Wide SCSI bus, including the internal wiring of SCSI device
- Maximum cable length of 39 ft (12 m) for an LVD SCSI bus

- Internal cable lengths of 22 in (56 cm) for Drive 0 and Robot and 15 in (38 cm) for Drive 1
- Cables of different impedances should not be used together

Additional specifications to assure the highest SCSI performance can be found in the current version of ANSI X3.131.

NOTE: This equipment has been tested for electromagnetic emissions and immunity using good quality shielded cables. If you use unshielded or poor quality cables, or otherwise vary from good practice, you might not comply with national and international rules.

Cabling the PTM and Multi-Unit Library System

Cabling the PTM and multi-unit Library system includes attaching cables to the following interface connectors:

- PTM motor housing assembly
- Library unit

Connecting to the PTM Motor Housing Assembly



CAUTION: Make sure the power is off to the unit that you plug the motor connector into.

1. Connect one end of the control cable to the connector in the PTM motor housing assembly (see Figure C-32).
2. Connect the other end of the control cable to the connector on the master unit (see Figure C-32).

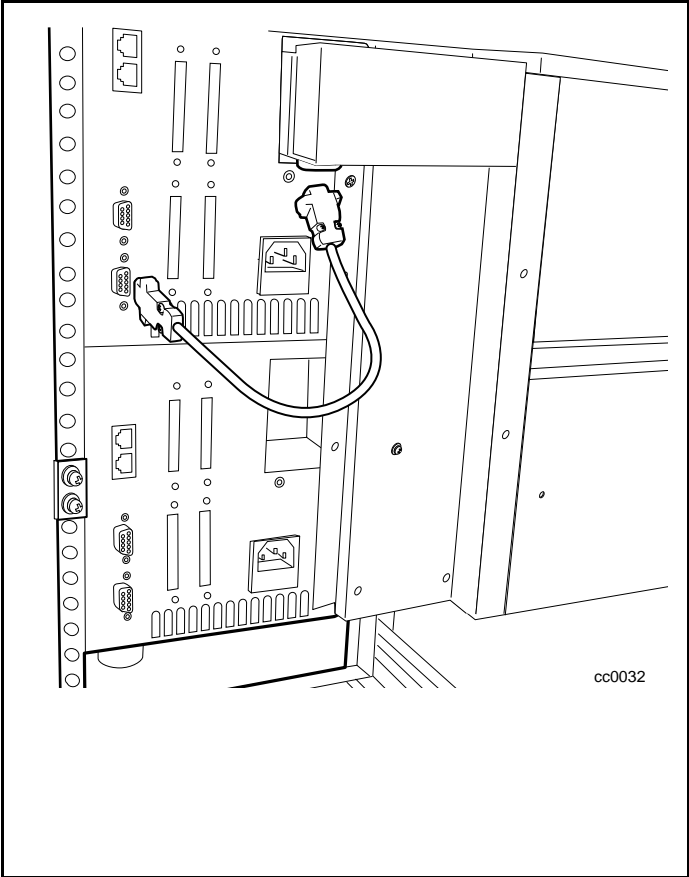


Figure C-32. Connecting to the PTM motor housing assembly

Connecting to Library Units

1. Attach a patch cable to one expansion port on the master unit (❶ Figure C-33).

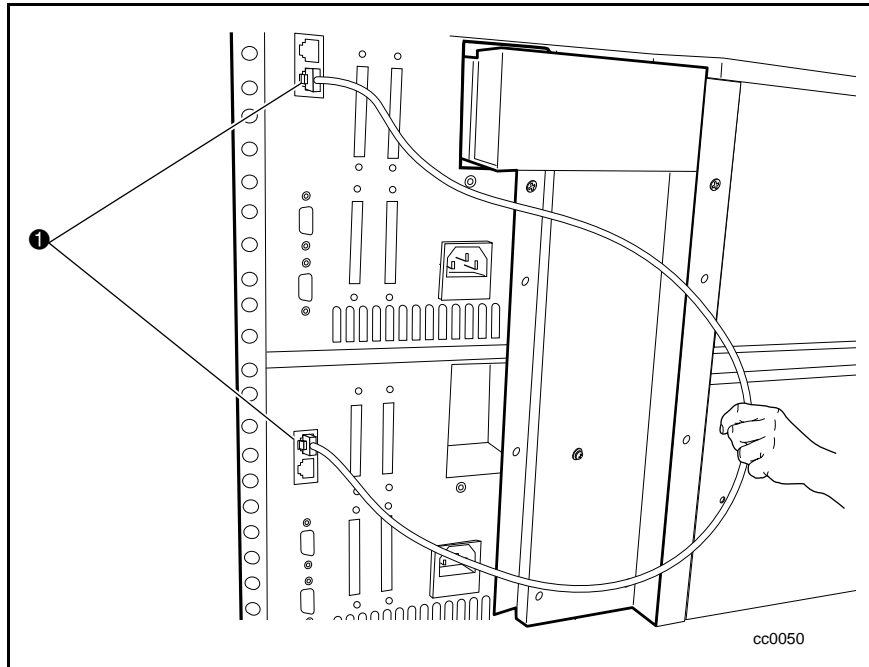


Figure C-33. Connecting a patch cable

2. Use additional patch cables to connect successive slave units to the master unit. Connect all Library units in a daisy-chain fashion (1 Figure C-34).

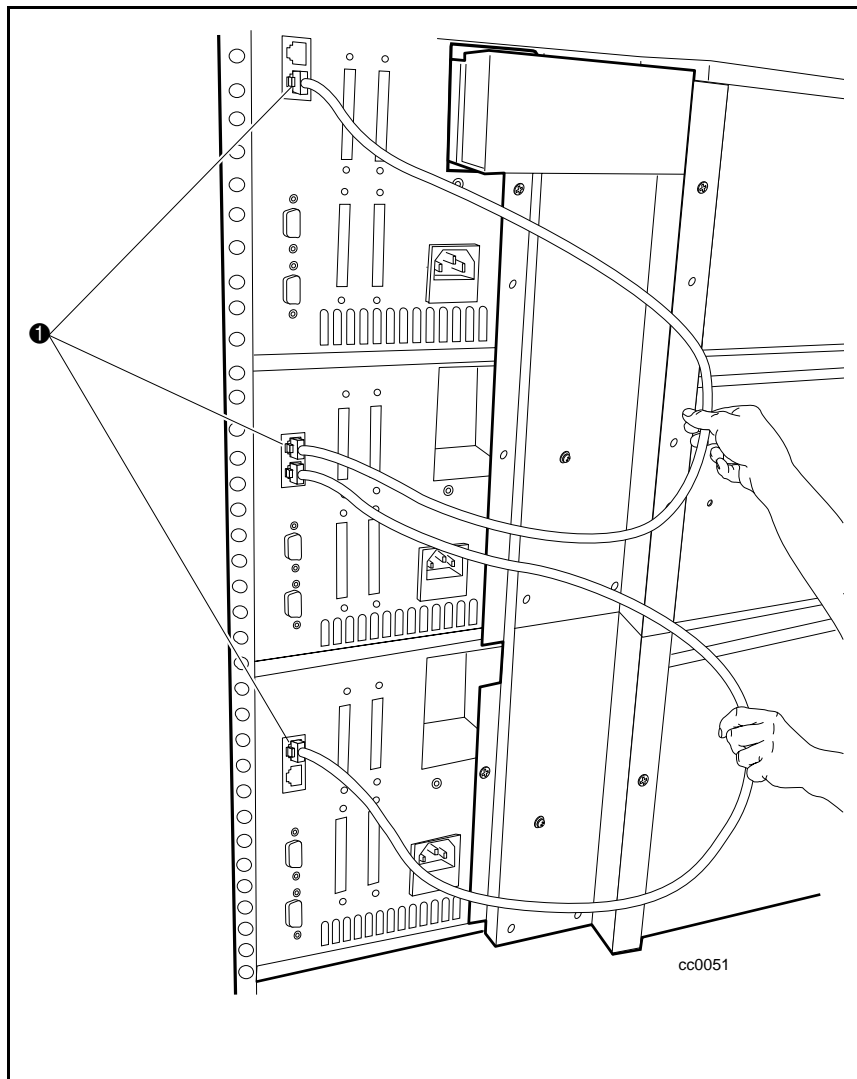


Figure C-34. Connecting to Library units

Configuring the Library

The Library is designed with many configuration options, each offering multiple settings to support a variety of applications and platforms. The setting of each option is stored in non-volatile memory in the unit. For most applications, you do not have to change the factory default settings. If you need to change the configuration, go on to the next section. If you are uncertain whether you need to change a setting, contact your Technical Support representative.

To change settings, use the control panel. For an overview of how the control panel works, and a description of the functions of the buttons, indicators and display, see “Entering the Menu Mode,” “Exiting the Menu Mode,” and “Navigating through the Menu Structure” in Chapter 2, “Operation.”

You can change the settings using the options contained in the Configuration menu described later in this appendix. Refer to your host computer documentation to determine which settings might need to be changed.

Setting a SCSI ID

1. Turn the Library on and wait until the Power-On Self Test (POST) terminates and the Primary or Secondary Default screen appears on the display. You can toggle between the two with the ▲ and ▼ buttons.

```
Loader Idle
Drv 0: No Tape
Drv 1: Unloaded
```

Or

```
Ready
0 ▶ □ □ _ _ _ _ _ □ ◀ 9
10 ▶ □ □ _ _ _ _ _ □ ◀ 18 ◀
```

2. At the Default screen, press the **Enter** button. The screen displays the following Main menu.

```
▶ Load/Unload
  Remove Magazine
  Maintenance Menu
  Configure Menu      ↓
```

3. Press the ▼ button three times to move the ▶ to the Configure menu, then press the **Enter** button. The screen displays the following Configure submenu. Note that the ↓ at the end of the fourth line means you can scroll to additional configuration options using the ▼ button.

```
▶ SCSI Options      ↑
  Library Options
  Barcode Options
  Set Element Base
```


4. To select a configuration option, press the ▲ or ▼ button on the control panel until the ► appears next to the option you want to change. The first two choices on this menu, SCSI Options and Library Options, are actually categories of options. In this case, choose SCSI Options. Press the **Enter** button to display the options for that category. The following submenu appears:

```
► Library Parity:
  *Enabled
  Library Bus ID:
    *0                ↓
```

NOTE: Look closely at the submenu listed above and note that the ► on the display is next to line 1, and that line 2 is indented. This tells you that it is a two-tiered menu. The ▲ and ▼ buttons work on two levels in this kind of menu, which is typical of many submenus of the Configure menu. The first level is as follows: If you press the ▼ button, the ► moves to line 3. If you press the ▲ button, the ► moves back to line 1.

If you press the **Enter** button while the ► is next to line 1 (or line 3), the ▲ and ▼ buttons operate on the second level. As a result, the ► moves next to line 2 (or line 4), and a ↓ appears at the end of line 4, indicating that there is a list of settings that can be selected using the ▲ and ▼ buttons.

The ↓ at the end of line 4 means that there are other options that can be displayed by scrolling, using the ▼ button repeatedly.

5. For example, set the Drive 0 bus ID to 3. With the ► next to line 1, press the ▼ button until the display scrolls as shown:

```
► Library Bus ID:      ↑
  *0
  Drive 0 Bus ID:
    *4                ↓
```

6. With the ► next to line 3, press the **Enter** button. The ► moves to line 4, the ↓ remains at the end of line 4, and a ↑ displays at the end of line 1.
7. Use the ▲ and ▼ buttons to scroll line 4 to display the possible settings. Scroll up so that a 3 appears and then press the **Enter** button to save the new selection. An * appears to the left of the 3 indicating it is the current selection.
8. Press the **Escape** button repeatedly until the submenu reappears.
9. Repeat this procedure for each configuration option you want to change.

Configuring a Library System

All Libraries are factory-shipped as stand-alone units. To include them in a multi-unit Library system, you must first configure one unit as the master and all other units as slaves. Any Library can be configured to be a standalone, master, or slave.

The Master Unit

The master unit controls the operations of a multi-unit Library system. All configuration changes to the system are performed at the operator panel of the master unit.

NOTE: In a storage cabinet, the master unit must occupy the top position to coordinate the action of the Pass-Through Mechanism (PTM).

To configure the master unit:

1. From the Default screen, press **Enter** to display the main menu.

```

▶ Load/Unload
  Remove Magazine
  Maintenance Menu
  Configure Menu      ↓
  
```

2. Press the ▼ button three times to move the ▶ to the Configure menu, then press the **Enter** button. The following Configure submenu appears. The ↓ at the end of the fourth line means you can scroll to additional configuration options using the ▼ button.

```

▶ SCSI Options
  Library Options
  Barcode Options
  Set Element Base   ↓
  
```

3. Press the ▼ button to move the ▶ to Library Options, then press the **Enter** button. The following screen appears:

```

▶ Configuration
  *Standalone
  Unload Mode
  *Implicit          ↓
  
```

4. Press **Enter** to move the cursor to the second line.
5. Use the ▼ and ▲ buttons to change the option to Master.
6. Press **Enter** to save the selection.

NOTE: The change will not take effect until you reboot.

The Slave Unit

You can configure the slave unit on the work bench before installation or after it is installed in a storage cabinet. If you configure it when it is already installed as part of a multi-unit Library system, be sure to either shut off power to the master unit or disconnect the serial cables. This lets you access Menu mode directly, thus avoiding communication interference from the master unit.

Each slave unit must have a unique one digit ID that you specify as part of the configuration procedure. You must stack and number the units as follows:

| |
|---------|
| Master |
| Slave 0 |
| Slave 1 |
| Slave 2 |
| Slave 3 |

To configure the slave unit:

1. From the Default Screen, press **Enter** to display the main menu.

```

▶ Load/Unload
  Remove Magazine
  Maintenance Menu
  Configure Menu      ↓
  
```

2. Press the ▼ button three times to move the ▶ to the Configure menu, then press the **Enter** button. The following Configure submenu appears. The ↓ at the end of the fourth line means you can scroll to additional configuration options using the ▼ button.

```

▶ SCSI Options
  Library Options
  Barcode Options
  Set Element Base   ↓
  
```

3. Press the ▼ button to move the ▶ to Library Options, then press the **Enter** button. The following screen appears:

```

▶ Configuration
  *Standalone
  Unload Mode
  *Implicit          ↓
  
```

4. Press **Enter** to move the cursor to the second line.
5. Use the ▼ and ▲ buttons to change the option to Slave.
6. Press **Enter** to save the selection. The display at lines 3 and 4 changes to let you specify a numerical ID for the slave module.

```

▶ Configuration
  *Slave
  Unload Mode
  *0                ↓
  
```

NOTE: You must reboot the unit to display the Slave Mode ID.

7. Press the ▼ button to move the move the ► to Slave Address.
8. Press **Enter** to move the cursor to the number option on the fourth line.
9. Use the ▼ and ▲ buttons to change the number.
10. Press **Enter** to save the selection.

NOTE: The change will not take effect until you reboot.

Setting up Reserved Slots

Use this option to withdraw some of the slots in the Library from use as storage slots to meet licensing requirements or to dedicate one or more slots as a cleaning slot.

How Reserved Slots are Numbered

Ordinary cartridge slots are numbered from the front of the magazine to the rear (see Figure C-35). If you reserve one slot, it becomes *Reserved Slot #1* in the last slot of the magazine. If you reserve two slots, slot #17 becomes *Reserved Slot #1*, while slot #18 becomes *Reserved Slot #2*. Additional reserved slots continue in this rear-to-front pattern. If your software license limits you to less than the full magazine capacity, *Reserved Slot #1* always follows the last unreserved data cartridge.

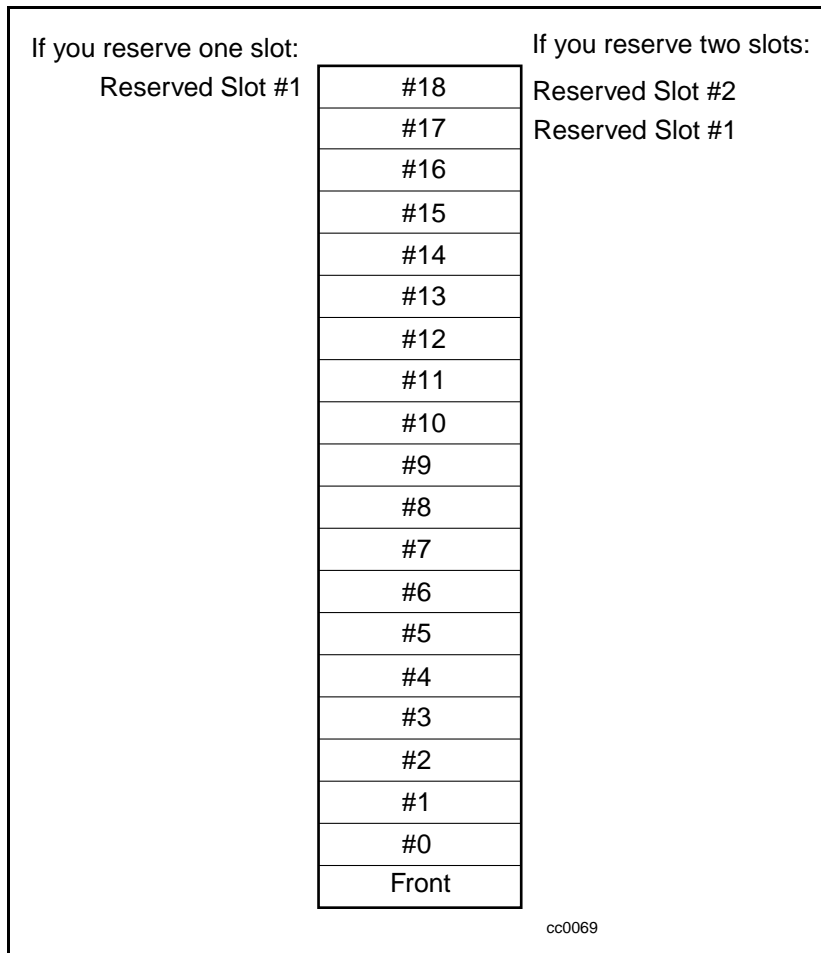


Figure C-35. Reserved slot locations

To Reserve Slots

1. From the Default screen, press the **Enter** button to display the Main menu.
2. From the Main menu, scroll down to the Configure menu and press the **Enter** button to display the following Configure submenu:
 - ▶ SCSI Options:
 - Library Options
 - Date and Time
 - Set Element Base ↓
3. Scroll down to Library Options and press the **Enter** button.
4. Scroll down to Reserved Slots and press the **Enter** button. The following screen appears:

Configuration:
*Standalone

.
.
.
.

Baud Rate:
*38,400

▶ Reserved Slots:
*0 ↑

5. Scroll down to the last line and specify the number of slots you are reserving. Press the **Enter** button to save.

NOTE: If your software license limits the number of usable slots in the magazine, you must reserve the remaining slots. You can use any of the reserved slots to store a cleaning cartridge (see Chapter 3, "Maintenance").

6. Press the **Escape** button repeatedly to return to the Default screen. Your choice takes effect the next time the Library is rebooted.

Configuration Options

The following options are available in the Configuration menu.

SCSI Options

Library Parity: Lets you enable or disable the library robotics SCSI bus parity checking. The default is Library Parity Enabled.

Library Bus ID: Lets you set the SCSI addresses of the library robotics. The default is 0.

Drive 0 Bus ID: Lets you set the SCSI addresses of the drives. The designators Drive 0 through Drive *n* refer to the first through *n*th drives, counting from the top unit in the Library system.

Drive 1 Bus ID: Lets you set the SCSI addresses of the drives. The designators Drive 1 through Drive *n* refer to the second through *n*th drives, counting from the top unit in the Library system.

Vendor ID: Lets you specify the response of the Library's robotics to the SCSI INQUIRY command in the Vendor ID field. The default is Compaq.

Product ID: Lets you specify the response of the Library's robotics to the SCSI INQUIRY command in the Product ID fields (Compaq SSL2000 Series) <Vendor unique>. The default is SSL2000.

Negotiation Mode: Lets you enable initiate synchronous negotiation. Initiate synchronous negotiation, if set, allows the Library to initiate SCSI synchronous negotiation with the host (the default is No). The Library always responds to host-initiated synchronous negotiation.

Transfer Rate: Lets you set the data transfer rate to 10 MB/s, 5 MB/s or asynchronous. The default is 10 MB/s.

Mode Page 1F Length: Lets you choose between two lengths of the mode sense/select device capabilities page (SCSI page 1Fh), which are short (14 bytes) and long (18 bytes), to accommodate different SCSI device implementations of this page. The default is Short.

Initialize Element Status: Lets you specify the unit's response to the SCSI INITIALIZE ELEMENT STATUS command. The possible settings are No Inventory, Force Inventory, and Force Label Scan. The default is No Inventory.

Unit Attn Report: Lets you select reporting of All or only One unit attention conditions. If set to All, the unit reports all unit attention conditions in sequence; if set to One, the unit reports only the highest priority condition. The default is All.

SCSI Mode: Defines the loader as SCSI-2 or SCSI-3. The default is SCSI-2.

Post Recv'd Error: Enables reporting of TapeAlert informational exception conditions with a Recovered Error sense key, when the Method of Reporting Information Exceptions (MRIE) field is set to a value of 0x3 in Mode Page 1Ch, or if the TapeAlert Mode option is set to Rec Error (cnd). The default is Disabled.

Tape Alert Mode: Specifies conditions for logging and reporting TapeAlert data. The default is Logging Disabled.

- *Logging Disabled*—Inhibits logging feature.
- *No Exceptions*—Device should not report information exceptions.
- *Unit Attention*—Report information exceptions with a Unit Attention sense key and an ASC/ASCQ of 5D/00.
- *Rec Error (cnd)*—Report information exceptions with a Recovered Error sense key and an ASC/ASCQ of 5D/00, if Recovered Error Reporting is enabled.
- *Rec Error (unc)*—Unconditionally report information exceptions with a Recovered Error sense key and an ASC/ASCQ of 5D/00.
- *No Sense*—Report information exceptions with a No Sense sense key and an ASC/ASCQ of 5D/00.
- *On Request*— Report information exceptions with a No Sense sense key and an ASC/ASCQ of 5D/00, only in response to an unsolicited Request Sense command.

Library Options

Configuration: Lets you configure the Library as a standalone, master, or slave unit. The default is standalone.

Unload Mode: Lets you determine whether a SCSI MOVE MEDIUM command is interpreted as *Implicit* or *Explicit*. If *Implicit*, the unit unloads a drive before attempting to move a cartridge from that drive. If *Explicit*, the host must issue a SCSI UNLOAD command to a drive before each MOVE MEDIUM command that removes a cartridge from that drive. The default is *Implicit*.

Numbering: Lets you specify whether SCSI elements in the unit display with either zero or one. This affects *only* the front panel display, not the actual SCSI element addresses. The default is 0.

Auto Clean: Lets you enable an automatic cleaning cycle which operates as part of the cartridge unload sequence whenever the Use Cleaner LED lights. To use this option, you must have reserved a slot for a cleaning cartridge using the Reserve Slots option. The default is Disabled.

Library Mode: Lets you set the robotics operating mode to Random, Sequential 1, Sequential 2 or Sequential Split. The default is Random.

NOTE: The sequential operating modes are available in standalone configuration only. If only one drive is installed, only the Sequential 1 option is available.

- *Random*—Normal operating mode. Enables complete host control of the robotics.
- *Sequential 0*—Loads cartridges in numerical order in all 19 magazine slots for Drive 0.
- *Sequential 1*— Loads cartridges in numerical order in all 19 magazine slots for Drive 1.
- *Sequential Split*—Loads cartridges in numerical order in magazine slots 0 through 9 for Drive 0 and magazine slots 10 through 18 for Drive 1.

Baud Rate: Lets you set the data transmission rate of the trace port. This function is intended for use by CEs only. The default is 38400 bits/s.

Reserved Slots: Lets you withdraw from use a specified number of slots in the back of the magazine. Some host software imposes size limits on tape library magazines for licensing purposes, and does not operate with a library that exceeds the licensed size. The default is 0.

Model Number: Lets you change the model number information displayed on the initial screens. You can choose between Compaq SSL2020, a blank line, and a vendor unique number. The Default is Compaq SSL2020.

Bar Code Options

Label Size: Lets you limit length of the bar code label. Possible settings are 1 through 8. The default is 8.

Label Alignment: Lets you specify the alignment of a bar code label. The options are Left or Right. When used in conjunction with the label size option, strips unwanted trailing characters (left alignment) or leading characters (right alignment). The default is Left Alignment.

Check Digit: Lets you set the data transmission rate of the trace port. This function is intended for use by CEs only. The default is Enable/No Send.

Set Element Base

Transport: Lets you set the base address of the robotics mechanism. The default is 0000.

Storage: Lets you set the base address of the 19 magazine slots. The default is 0001.

Transfer: Lets you set the base address of the drive. The default is 00E0 for Drive 0.

Import/Export: Lets you set the base address of the mail slot. The default is 00D0.

Set Serial Number

Serial Number: Lets you alter the unit's serial number as stored in the unit. The Library's robotics reports these settings in response to the SCSI INQUIRY command in the Unit Serial Number Page.

Set Default

Compaq Defaults: Resets all configuration options to Compaq defaults.

Configuration Settings

Table C-1 lists the configuration settings for the Library.

Table C-2
Library Configuration Options

| Option | Settings | Default |
|-----------------------|--|-----------------|
| SCSI Options | | |
| Library Parity | Enabled, Disabled | Enabled |
| Library Bus ID | SCSI ID 0-15 | 0 |
| Drive 0 Bus ID | SCSI ID 0-15 | 4 |
| Drive 1 Bus ID | SCSI ID 0-15 | 5 |
| Vendor ID | Compaq | Compaq |
| Product ID | SSL2020 | SSL2020 |
| Negotiation Mode | Initiate, Do Not Initiate | Do Not Initiate |
| Transfer Rate | Sync 5 MB/s, Sync 10 MB/s, Async Only | Sync 10 MB/s |
| Mode Page 1F Length | Short (000E), Long (0012) | Short |
| Init. Element Status | No Inventory, Force Inventory, Force Label Scan | No Inventory |
| Unit Attention Report | One, All | All |
| SCSI Mode | SCSI-2, SCSI-3 | SCSI-2 |
| POST Recovered Error | Enabled, Disabled | Disabled |

continued

Table C-2
Library Configuration Options *continued*

| Option | Settings | Default |
|-------------------------|---|------------------|
| Tape Alert Mode | Logging Disabled, No Exceptions, Unit Attention, Rec Error (cnd), Rec Error (unc), No Sense, On Request | Logging Disabled |
| Library Options | | |
| Configuration | Standalone, Master, Slave | Standalone |
| Unload Mode | Implicit, Explicit | Implicit |
| Element Base | One Based, Zero Based | Zero Based |
| Auto Clean | Enabled, Disabled | Disabled |
| Library Mode | Random, Sequential 0, Sequential 1, Sequential Split | Random |
| Baud Rate | Auto, 2400, 9600, 19200, 38400, 57600, 115200 | 38400 |
| Reserved Slots | 0 through n (one less than magazine) | 0 |
| Model Number | Compaq SSL2020 | Compaq SSL2020 |
| Bar Code Options | | |
| Label Size | 1 through 6 | 6 |
| Label Alignment | Left or Right | Left |
| Check Digit | Enable/Send or Enable/No Send | Enable/No Send |

continued

Table C-2
Library Configuration Options *continued*

| Option | Settings | Default |
|----------------------------------|-----------------------------|-----------------------------|
| Set Element Base Options | | |
| Transport | NNNN (hex) | 0x0000 |
| Storage | NNNN (hex) | 0x0001 |
| Transfer | NNNN (hex) | 0x00F0 |
| Import/Export | NNNN (hex) | 0x00E0 |
| Set Serial Number Options | | |
| Serial Number | Format To Match nnnnnnnnnnn | Format To Match nnnnnnnnnnn |
| Set Default Options | | |
| Compaq Defaults | Compaq Defaults | Compaq defaults |

NOTE: The options listed in this table represent the version of the firmware in use when this manual was written. If the options displayed on your control panel differ from those described here, you can download the latest option descriptions from the Compaq website (www.compaq.com) or contact your Technical Support representative.

NOTE: The serial number must be set for compatibility with certain Library software.

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