# **hp** StorageWorks

## MSL5000 series pass-through mechanism reference guide

Part Number: 231908-003

**Third Edition (August 2002)**

This guide is to be used as step-by-step instructions for installing and configuring an hp StorageWorks MSL5000 Series Pass-Through Mechanism.

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# About this Guide

The following sections are covered:

- Text Conventions
- Symbols in Text
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- Rack Stability
- Getting Help
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## Text Conventions

This document uses the conventions in Table 1 to distinguish elements of text.

**Table 1:  Text Conventions**

| Element | Convention | Examples |
|---|---|---|
| • **Named Keys**<br>• **Key Sequences** | **Bold** | **Home, Print Screen, Num Lock, Esc, PgUp**<br>A plus sign (**+**) between two keys means that you should press them simultaneously: **Ctrl+A**, **Ctrl+Home**, **Alt+Ctrl+Del** |
| • Menu Items<br>• Directory Names<br>• Button Names<br>• Dialog Box Names | Initial Caps<br>(for UNIX, AIX, and Solaris directory names, the exact case of every character is displayed). | On the File menu, choose Save.<br>Save the file in the C:\StorageSets\Default directory.<br>(UNIX, AIX, Solaris): Save the file in the /home/newuser/practice directory.<br>To back up files, click the Backup Now button.<br>In the Save As dialog box, choose the drive then the folder. |

**Table 1: Text Conventions (Continued)**

| Element | Convention | Examples |
|---|---|---|
| • User Input and System Responses (Output and Error Messages)<br>• COMMAND NAMES<br>• Drive Names | Initial Caps and `monospace font`.<br><br>`COMMAND NAMES` appear in upper case, unless they are case sensitive (UNIX, AIX, and Solaris command names are case sensitive and will not appear in uppercase).<br><br>Entered `<variables>` are displayed in angle brackets (`<  >`) and all lower case. | User Input and System Responses:<br>• To exit from the program, type `Exit`.<br>• At the prompt, type this command: `SHOW THIS_CONTROLLER` (no variable)<br>• To see your settings, give the command: `SHOW <storagesets> FULL` (with variable)<br>• You will see the `Continue?` message.<br>Command Names<br>• Use `SET THIS_CONTROLLER` to change parameters.<br>• To manage storage, enter `RUN sysmgr.exe`<br>• (UNIX, AIX, Solaris): To list files, give the `ls` command.<br>• Drive Names:<br>  Navigate to your CD-ROM drive (usually `D:` or `E:`). |
| *filenames* | Unless case sensitive, use *lowercase italics*. If filenames are case-sensitive (UNIX, AIX, Solaris) or are easier to understand with some upper case letters, the exact case of each character is displayed. | To configure storage, edit *storageset.ini*.<br>Changes are stored in *NewSystemConfigurationFile.ini*.<br>(UNIX, AIX, Solaris): Errors are logged to *MixedCaseFile.txt.* |
| Menu Command Sequences | Initial Caps, with a right angle bracket (>) between items. Menu items are displayed as shown on screen. | To compare documents, choose:<br>Tools > Documents > Compare. |
| URLs | Sans serif font. | For update notices, visit:<br>http://the new.hp.com |

# 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 or damage to equipment.**

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

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

**NOTE:**  Text set off in this manner presents commentary, sidelights, or interesting points of information.

# Symbols on Equipment

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

> **Any RJ-45 receptacle marked with these symbols indicates a network interface connection.**
>
> **WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.**

Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. Contact with this surface could result in injury.

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

Power supplies or systems marked with these symbols indicate the presence of multiple sources of power.

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

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

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

# Rack Stability

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

- **The leveling jacks are extended to the floor.**
- **The full weight of the rack rests on the leveling jacks.**
- **In single rack installations, the stabilizing feet are attached to the rack.**
- **Racks are coupled in multiple rack installations.**
- **Only one rack component is extended at any time. A rack may become unstable if more than one rack component is extended for any reason.**

# Getting Help

If you still have a question after reading this guide, contact service representatives or visit our website.

## Technical Support

In North America, call the technical support at 1-800-OK-COMPAQ. This service is available 24 hours a day, 7 days a week.

**NOTE:** For continuous quality improvement, calls may be recorded or monitored.

Outside North America, call technical support at the nearest location. Telephone numbers for worldwide technical support are listed on the HP website: http://thenew.hp.com/country/us/eng/support.html.

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

- Technical support registration number (if applicable)

- Product serial numbers

- Product model names and numbers

- Applicable error messages

- Operating system type and revision level

- Detailed, specific questions

## Product Website

The HP website has the latest information on this product as well as the latest drivers. Access the HP website at: http://www.compaq.com/storage/tape_index.html.

# Authorized Reseller

For the name of your nearest authorized reseller:

- In the United States, call 1-800-345-1518.

- In Canada, call 1-800-263-5868.

- Elsewhere, see the HP website for locations and telephone numbers.

# 1

# Introduction

The HP StorageWorks Pass-Through Mechanism (PTM) enables the transfer of tape cartridges between HP StorageWorks MSL5000 Series Libraries. A single PTM system can be used to connect up to eight MSL5000 libraries, up to 40U height, creating a multi-unit tape library configuration.

**NOTE:** See "Planning the Installation" in Chapter 2 for specific configuration details.

> ⚠ **CAUTION:** To avoid damage to the equipment and loss of data, all multi-unit tape library components (libraries and PTM components) must be LTO Ultrium capable.

**IMPORTANT:** All MSL5000 Series libraries in a multi-unit library configuration must use the same drive types. Check with your application software vendor to manage partitioning by tape technology if you want to mix DLT and SDLT drive types in a multi-unit library configuration.

Mixed media using Ultrium cartridges is not supported on libraries with firmware levels of 4.04 or earlier.

The PTM installation procedure consists of the following steps:

- Preparing for the PTM installation
- Installing the PTM
- Cabling the PTM
- Configuring the PTM

**NOTE:** An MSL5000 Series PTM is not compatible with either a TL series or an SSL series PTM.

# Preparing for the PTM Installation

Before beginning the installation procedure:

1. Using the packing slip, verify the components that came with the PTM Upgrade Kit.

2. Make sure that you have the required tools.

3. Make sure the library is functional. Refer to Chapter 4 of the *hp StorageWorks MSL5000 Series Library User Guide*.

4. Make sure that you are using the proper version of firmware. See the section, "Verifying the Firmware Level" in Chapter 3.

## PTM Components

The following components typically ship with a PTM Kit:

- PTM (base unit)
- LAN hub and bracket
- Primary motor cable
- AC power cord (U.S. only, country-specific cords are not provided)
- Ethernet cables

The following components ship with an Extender Upgrade Kit:

- One Ethernet cable
- 5U or 10U extension
- Attachment hardware

## PTM Required Tools

The following tools are required to perform a PTM installation:

- #2 Phillips screwdriver (Stubby or right-angle)
- #1 Phillips screwdriver
- Flat-blade screwdriver
- Large paper clip
- Diagonal cutting pliers

# 2

## Installing the PTM

This chapter describes how to install a Pass-Through Mechanism (PTM) for an HP StorageWorks MSL5000 Series Library. Sections in this chapter include:

- Planning the Installation

- Positioning the Libraries

- Installing the LAN Hub

- PTM Base Unit Description

- Installing a Single PTM Base Unit

- Preparing to Install a PTM (MSL5052/MSL5060)

- Adding Extensions to a PTM Base Unit

- Installing a Longer Belt to an Extended PTM

- Installing the Extended PTM

- Cabling the PTM and LAN Hub

# Planning the Installation

A PTM can be mounted into the following rack enclosures:

- Compaq 7000/9000/10000 Series
- AlphaServer H9A
- hp rack system/e

Two PTM variations are available:

- A factory-assembled PTM (base unit) that can be used to connect two MSL5026 or MSL5030 libraries (one master and one slave).
- The PTM base unit plus extensions with a combined length equal to the number of adjacent MSL5000 Series libraries installed in a rack enclosure.
  - For MSL5026/MSL5030 libraries: one master and up to seven additional slaves.
  - For MSL5052/MSL5060 libraries: one master and up to three additional slaves.
  - Any combination of up to eight MSL5000 Series libraries not to exceed 40 U.

**NOTE:** Two unique extension sizes are available: 5 Unit (5U) and 10 Unit (10U).

If PTM extensions are required, assemble the entire PTM system before installing it in a multi-unit library configuration.

> ⚠ **CAUTION:** Do not apply power to any library. Attempting to connect or disconnect a PTM to a library that has power applied can damage the library and the PTM base unit PCB.

# Determining the Type and Number of Extensions

The PTM base unit measures 10U. Use the following guidelines to add extensions.

**IMPORTANT:** You cannot add two MSL5026/MSL5030 slaves using a 10U extension kit due to 10-BaseT cable requirements in the kit.

## MSL5026/MSL5030 as the Master Unit

- If you are adding one MSL5026/MSL5030 as a slave, no additional extensions are required.

- If you are adding one MSL5052/MSL5060 as a slave, an additional 5U extension is required.

- Additional MSL5026/MSL5030 slaves require the addition of a 5U extension kit for each unit after the first.

- Additional MSL5052/MSL5060 slaves require the addition of a 10U extension kit for each unit after the first.

## MSL5052/MSL5060 as the Master Unit

- Additional MSL5026/MSL5030 slaves require the addition of a 5U extension kit for each unit.

- Additional MSL5052/MSL5060 slaves require the addition of a 10U extension kit for each unit.

**IMPORTANT:** You cannot add two MSL5026/MSL5030 slaves using a 10U extension kit due to 10-BaseT cable requirements in the kit.

# Positioning the Libraries

The PTM must be attached to the top two libraries in a multi-unit library configuration. Additional slave libraries can be installed anywhere below the first two libraries, in any order. Note that additional standalone libraries may be installed above the multi-unit library configuration.

The top library in the multi-library configuration (master) senses the position of each library during initialization at power-up.

**CAUTION:** To avoid damage to the equipment and loss of data, all multi-unit tape library components (libraries and PTM components) must be LTO Ultrium capable.

**IMPORTANT:** All MSL5000 Series libraries in a multi-unit library configuration must use the same drive types. Check with your application software vendor to manage partitioning by tape technology if you want to mix DLT and SDLT drive types in a multi-unit library configuration.

Mixed media using Ultrium cartridges is not supported on libraries with firmware levels of 4.04 or earlier.

# Installing the LAN Hub

An eight-port LAN hub is included in the PTM Upgrade Kit. It comes pre-assembled in its own bracket for installation at the side of a rack enclosure. The LAN hub is used to connect each installed library to a WAN via the 10-BaseT connector on the library controller board for coordinating PTM operation and communication.

To install the LAN hub:

1. Install cage nuts/clip nuts as indicated in Figures 2-1 through 2-4.

2. Carefully install the LAN hub bracket.
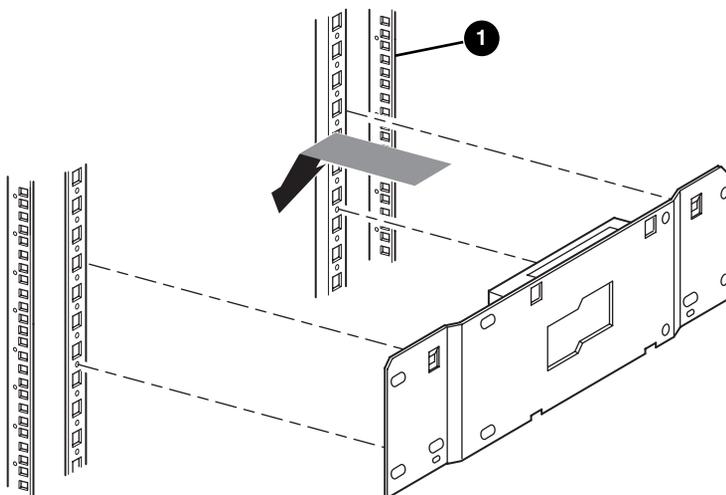


**Figure 2–1:  Installing the LAN hub into a standard 7000/9000/10000 rack enclosure**

❶    Front of rack enclosure
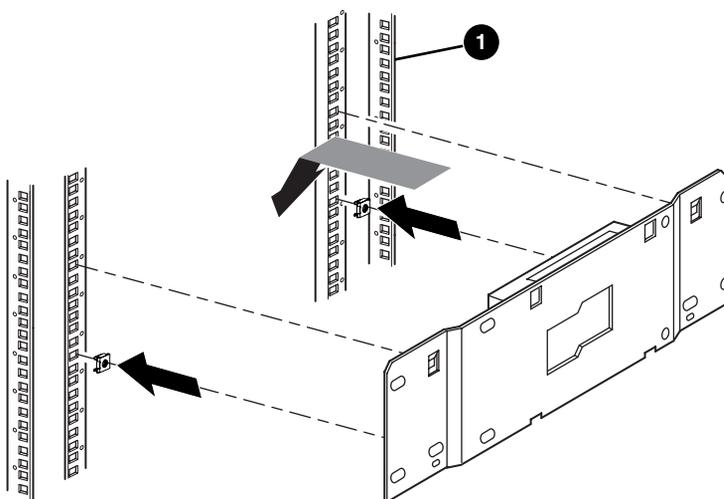
**Figure 2–2: Installing the LAN hub into a dual RETMA 9000/10000 rack enclosure**

❶    Front of rack enclosure
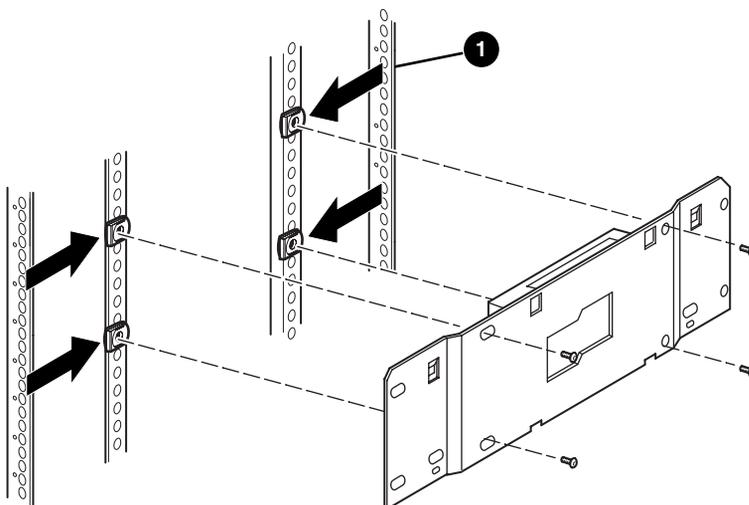


**Figure 2–3: Installing the LAN hub into an H9A rack enclosure**
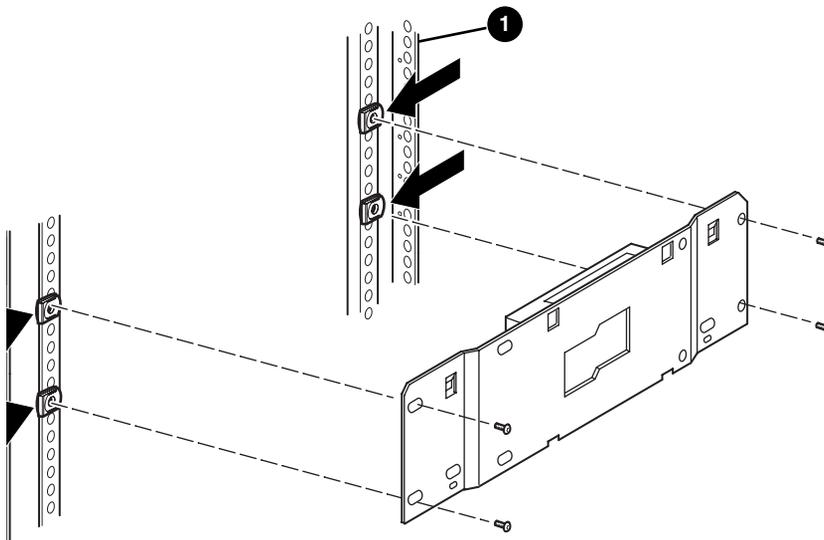
**Figure 2–4: Installing the LAN hub into a system/e rack**

3. Connect the supplied AC power cable to the LAN hub and to the rack enclosure AC power outlet. Do not turn the LAN hub on at this time.

4. Attach the 10-BaseT cables to the LAN hub for each library. See the section on "Cabling the PTM and LAN Hub," for connecting instructions.

5. Attach a network cable to the LAN hub. See the section on "Cabling the PTM and LAN Hub," for connecting instructions.

# PTM Base Unit Description

The PTM base unit comes factory assembled and contains the following components (see Figure 2–5).



| | | | |
|---|---|---|---|
| ❶ | Drive Motor Pulley | ❼ | Belt Tensioner Ramp and Idler Pulley |
| ❷ | Drive Belt | ❽ | Primary Motor Cable |
| ❸ | Belt Block Bracket Access Cutout | ❾ | Primary Motor Cable Connector |
| ❹ | Media Elevator Car | ❿ | Reserved for future use |
| ❺ | Belt Block and Brackets | ⓫ | Printed Circuit Board (PCB), Motor Controller |
| ❻ | Thumbscrews (Top, Middle, and Bottom) | ⓬ | Drive Motor |
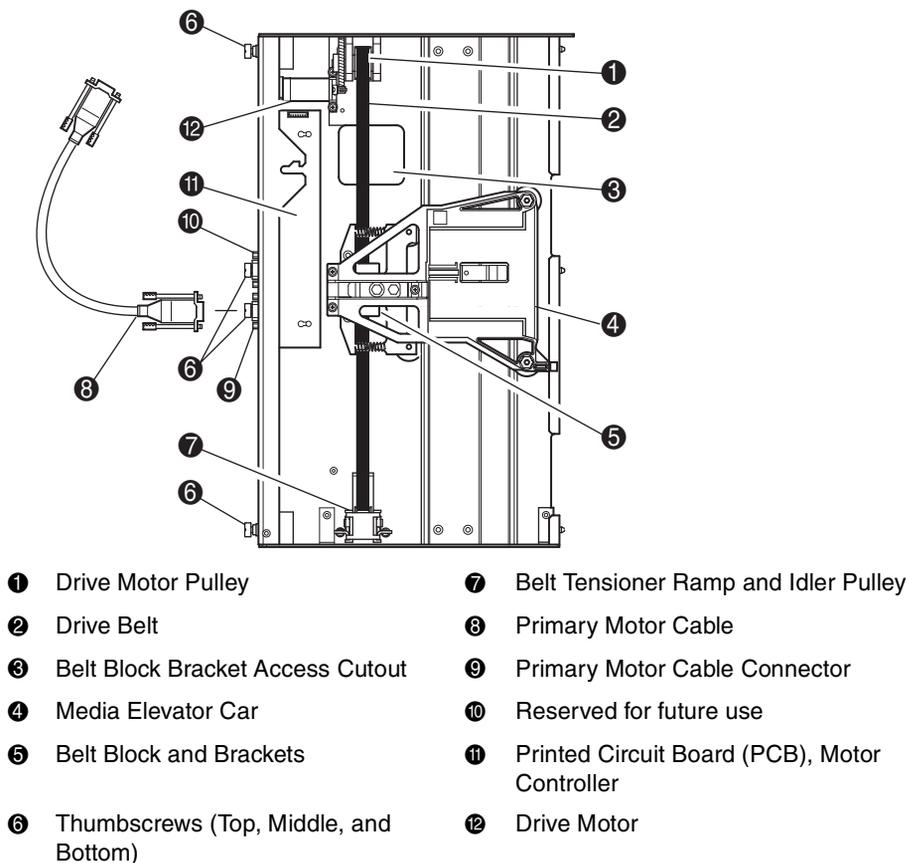
**Figure 2–5: PTM base unit**

# Installing a Single PTM Base Unit

To install a single PTM base unit:

1. Install two MSL5026/MSL5030 libraries, as shown in Figure 2–6, following the instructions in the *hp StorageWorks MSL5000 Series Library User Guide*.

**IMPORTANT:** Each library needs to be pulled out sequentially from the front of the rack enclosure to gain access to the top PTM cover plate screw on a lower library. See Figure 2–8 for screw locations.

⚠ **CAUTION:** Do not apply power to either library. Attempting to connect or disconnect a PTM base unit to a library that has power applied can damage the library and the PTM base unit PCB.
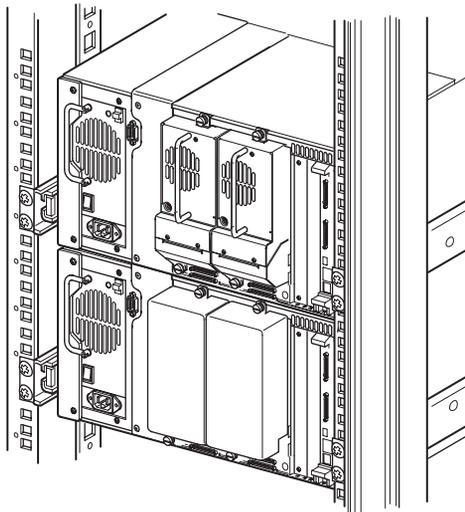


**Figure 2–6: MSL5026/MSL5030 library installation (9000 rack enclosure shown)**

**NOTE:** After installing the libraries, secure each one to the rack enclosure using its front bezel thumbscrews.

2. Remove the blank panel or drive shoe assembly 1 from the bay adjacent to the PTM cover plate opening (see Figure 2–7).

   a. Loosen the captive retaining screws at the top and bottom of the blank panel or drive shoe assembly 1.

   b. Remove the blank panel or pull straight back on the drive shoe assembly 1 handle to unplug it. Note that some effort might be required to overcome the initial resistance of unplugging the drive shoe assembly from the hot-plug connector. A gentle wiggling motion may aid removal.

c. Fully disengage drive shoe assembly 1. Continue to slide drive shoe assembly 1 out while supporting it until the tape drive hardware clears the back of the library hot-plug connector.
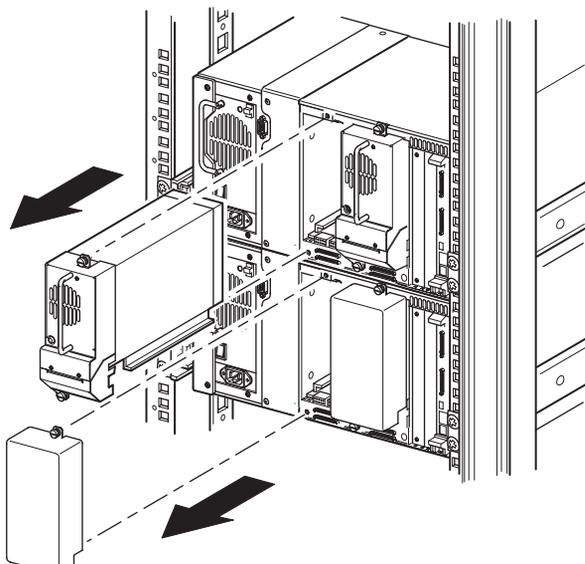
**Figure 2–7: Accessing drive bay 1**

3. Remove the PTM cover plate.

    **NOTE:** If the PTM cover plate has not previously been removed, each library needs to be pulled out sequentially from the front of the rack enclosure so you can gain access to the top PTM cover plate screw on a lower library.

    a. Using a #1 Phillips screwdriver, remove the screw securing the cover plate to the top of each library chassis.

    b. Using a stubby or right-angle #2 Phillips screwdriver, remove the screws securing the cover plate to the inside of the drive cage of each library chassis.

    c. Using a #2 Phillips screwdriver, remove the screws that secure the PTM cover plate to the rear of each library chassis (see Figure 2–8).

    **IMPORTANT:** Do not discard the PTM cover plate or screws. If the unit ever requires shipping, the PTM cover plate must be reinstalled to prevent in-transit damage.
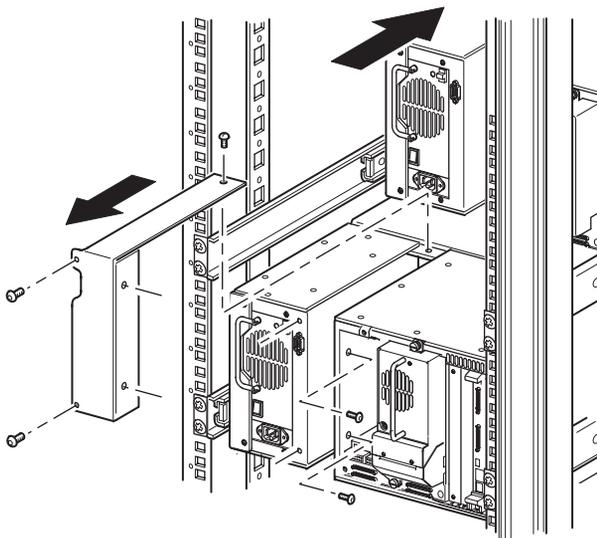


**Figure 2–8: Removing the PTM cover plate**

4. Install the PTM base unit (see Figure 2–9).

   a. Use the handle while supporting the PTM base unit from the bottom.

   b. Carefully insert the PTM base unit into the top library making sure the top pins are fully engaged.

   c. Using the PTM base unit top and top-middle thumbscrews, secure the PTM base unit to the top library.

      **NOTE:** If the lower pins are difficult to align to the bottom (slave) library, push the slave library slightly forward. Afterwards, engage it by pulling it toward the PTM base unit before tightening the lower thumbscrews.

   d. Using the PTM base unit bottom-middle and bottom thumbscrews, secure the PTM base unit to the bottom library.

      **NOTE:** If you still cannot align the bottom library to the PTM base unit, slightly loosen the rear rail bracket screws for the bottom library, reposition it, and then secure it to the PTM base unit. Afterwards, re-tighten the rear rail bracket screws.
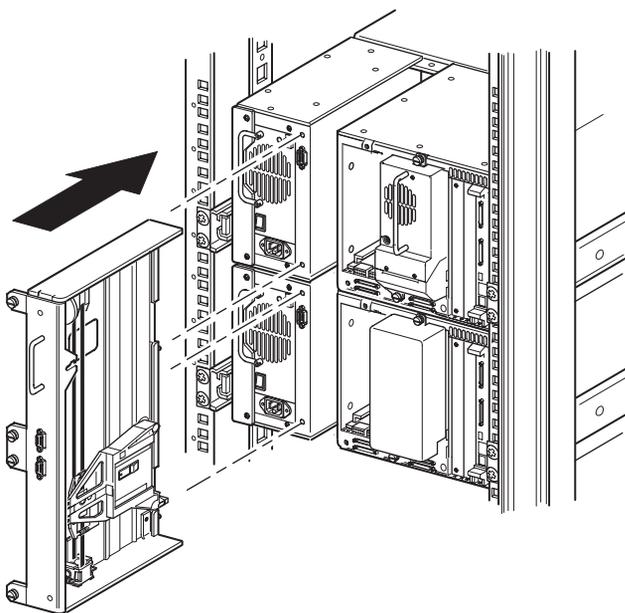


**Figure 2–9: Installing the PTM base unit**

5. Connect the PTM base unit following the instructions in "Cabling the PTM and LAN Hub," described later in this chapter.

6. If required, install any previously removed drive assemblies and covers.

7. If necessary, tighten the thumbscrews at the front of the unit and replace the bezel.

# Preparing to Install a PTM (MSL5052/MSL5060)

To prepare to install a PTM:

**NOTE:** A 10U extension must be added to the PTM base unit to connect two MSL5052 or MSL5060 libraries. See "Adding Extensions to a PTM Base Unit," described later in this chapter.

1. Install two MSL5052/MSL5060 libraries, as shown in Figure 2–10, following the instructions in the *hp StorageWorks MSL5000 Series Library User Guide*.

**IMPORTANT:** Each library needs to be pulled out sequentially from the front of the rack enclosure to gain access to the top PTM cover plate screw on a lower library. See Figure 2–12 for screw locations.

$\triangle$ **CAUTION:** Do not apply power to either library. Attempting to connect or disconnect a PTM base unit to a library that has power applied can damage the library and the PTM base unit PCB.
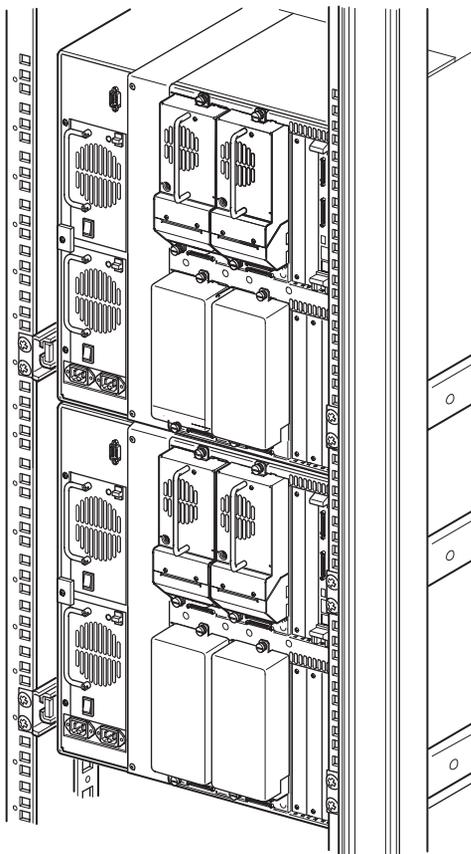
**Figure 2–10: Library installation, MSL5052/MSL5060 (9000 rack enclosure shown)**

**NOTE:** After installing the libraries, secure each one to the rack enclosure using its front bezel thumbscrews.

2. Remove the blank panels or drive shoe assembly 1 and 3 from the bays adjacent to the PTM cover plate openings of each library (see Figure 2–11).

   a. Loosen the captive retaining screws at the top and bottom of the blank panels or drive shoe assembly 1 and 3.

b. Remove the blank panels or pull straight back on the drive shoe assembly 1 and 3 handles to unplug them. Note that some effort might be required to overcome the initial resistance of unplugging a drive shoe assembly from a hot-plug connector. A gentle wiggling motion may aid removal.

c. Fully disengage drive shoe assembly 1 and 3. Continue to slide drive shoe assembly 1 and 3 out while supporting them until the tape drive hardware clears the back of the library hot-plug connectors.
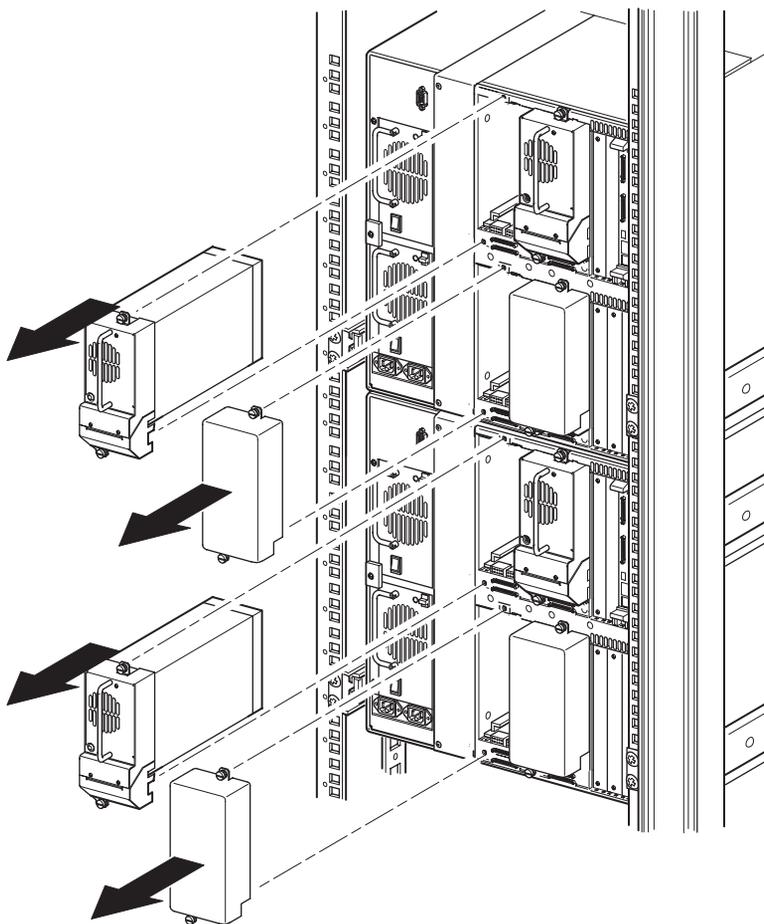


**Figure 2–11:  Accessing drive bays 1 and 3 (MSL5052/MSL5060)**

3. Remove the PTM cover plate.

   **NOTE:** If the PTM cover plate has not previously been removed, each library needs to be pulled out sequentially from the front of the rack enclosure so you can gain access to the top PTM cover plate screw on a lower library.

   a. Using a #1 Phillips screwdriver, remove the screw securing the cover plate to the top of each library chassis.

   b. Using a stubby or right-angle #2 Phillips screwdriver, remove the screws securing the cover plate to the inside of the drive cage of each library chassis.

   c. Using a #2 Phillips screwdriver, remove the screws that secure the PTM cover plate to the rear of each library chassis (see Figure 2–12).

   **NOTE:** Do not discard the PTM cover plate or screws. If the unit ever requires shipping, the PTM cover plate must be reinstalled.
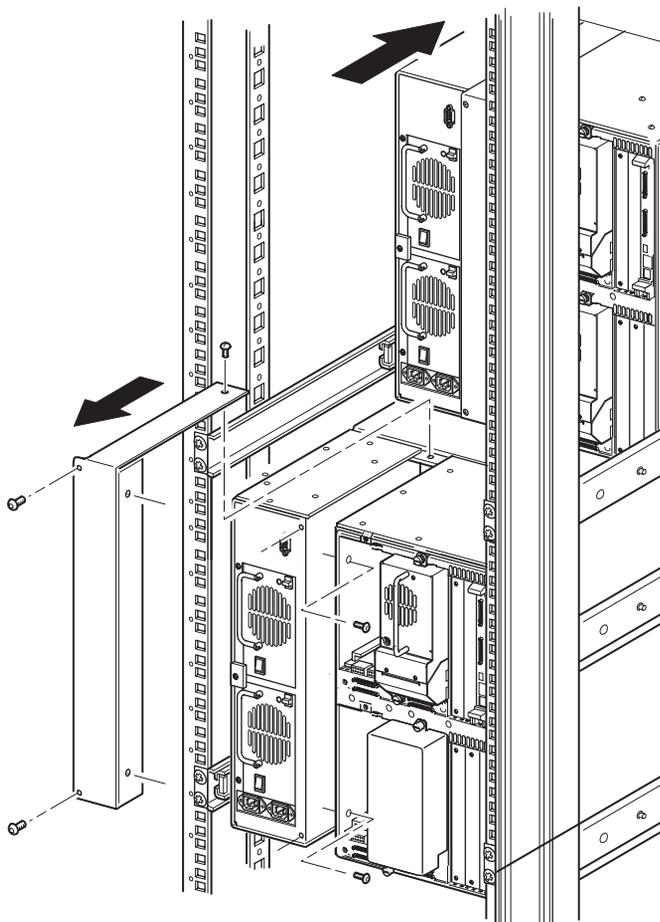
**Figure 2–12: Removing a PTM cover plate (MSL5052/MSL5060)**

# Adding Extensions to a PTM Base Unit

To add extensions to a PTM base unit, you will need a clean, flat work area such as a table or work bench. The surface should be long enough to support the full length of the PTM base unit and all extensions. Use the following procedure to add extensions to a PTM base unit.

**NOTE:** During this procedure, make sure you save all screws, the PTM base unit bottom bracket, and the belt tensioner ramp/idler pulley springs and associated hardware. These items must be reused when adding extensions.

1. Remove the bottom plate from the PTM base unit (see Figure 2–13).
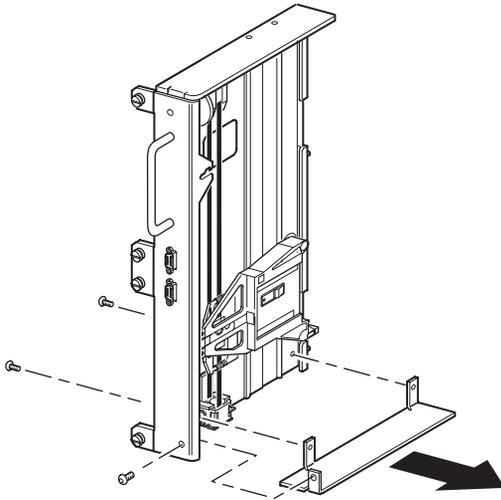


**Figure 2–13: Removing the bottom plate from the PTM base unit**

2. Slide the media elevator car to the top of the PTM base unit (see Figure 2–14). Note that the top of the PTM base unit has the drive motor on it.

   **NOTE:** The media elevator car should now be positioned over the belt block bracket access cutout next to the PCB and drive motor.
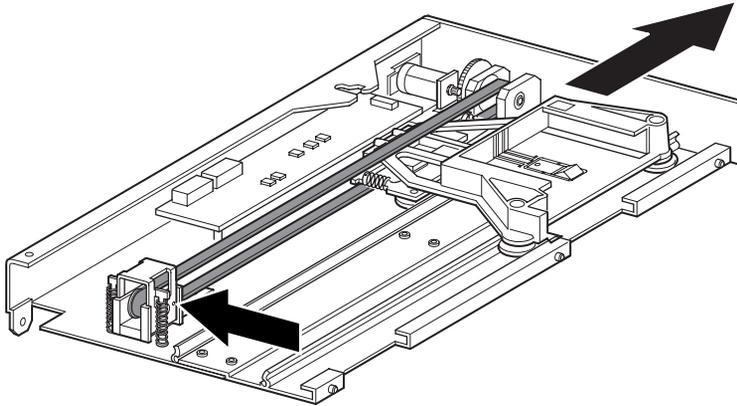
**Figure 2–14: Media elevator car location**

3. Insert a large paper clip through the holes on the idler pully base to set the idler pulley tension to zero. (See Figure 2-13.)

4. Turn the PTM over to access to the belt block bracket access cutout (see Figure 2–15).

> ⚠ **CAUTION:** To prevent damage to the PTM media elevator car it must be supported from underneath any time you are performing procedures on the belt block bracket assembly.

5. Remove one screw from each of the two belt block brackets. Loosen the other screw and move each belt block bracket to the side to gain access to the drive belt (see Figure 2–15).
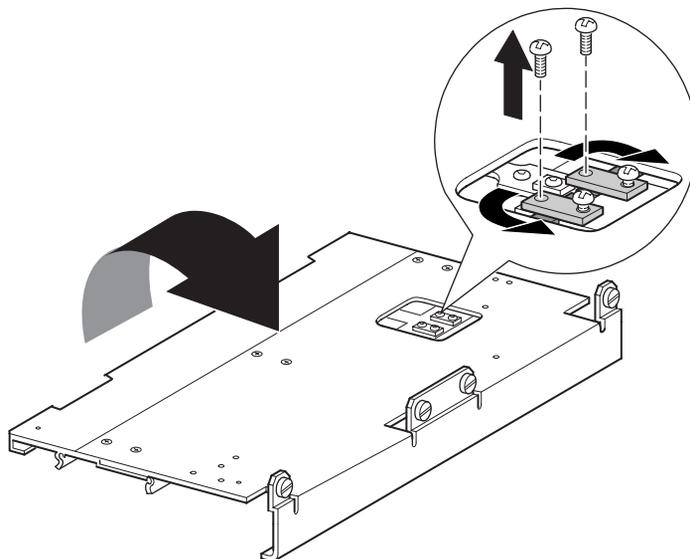
**Figure 2–15: Belt block bracket access cutout**

6. Turn the PTM base unit over and then remove the drive belt from the media elevator car, the belt tensioner ramp, and the idler pulley (see Figure 2–5).

7. Discard the belt.

8. Remove the belt tensioner ramp and idler pulley components as follows (see Figure 2–16):

   a. Remove the two screws and springs from the belt tensioner ramp and idler pulley.

   b. Remove the two screws that secure the belt tensioner ramp and idler pulley to the PTM base unit.

   c. Remove the belt tensioner ramp and idler pulley.

      **IMPORTANT:** Retain the belt tensioner ramp/idler pulley springs and associated hardware for use in the subsequent installation steps. To avoid misplacing this hardware you can use steps 11 and 12 to install it on the last extension at this time, if desired.
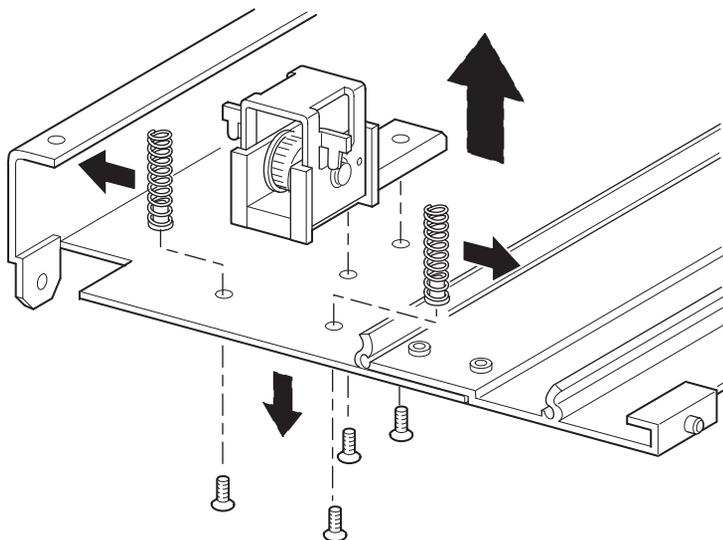
**Figure 2–16:  Removing the belt tensioner ramp and idler pulley**

9.  Mount a 5U or 10U extension as follows (see Figure 2–17):

    a.  Insert the alignment pins of the extension into the corresponding slots at the bottom of the PTM base unit.
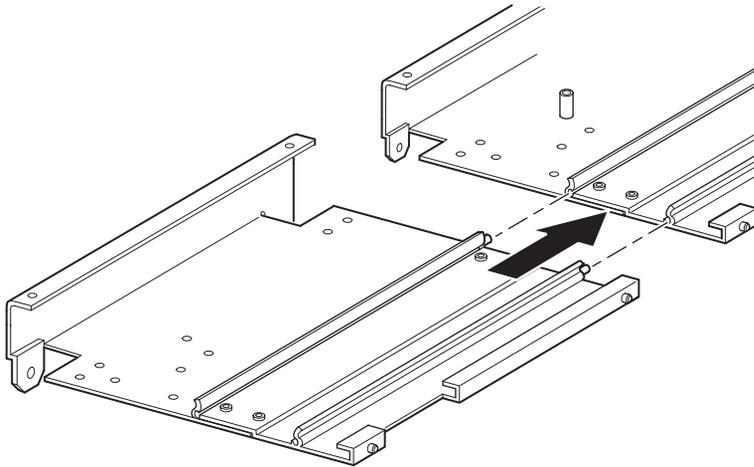
**Figure 2–17:  Mounting a 5U or 10U extension**

    b.  Align the pins of the two narrow tie bars with the holes in the extension and PTM base unit (see Figure 2–18) and then attach them using four mounting screws (two screws for each narrow tie bar).

    c.  Attach the large tie bar (beveled edge to the inside corner of the PTM base unit and extension) using four mounting screws (see Figure 2–18).
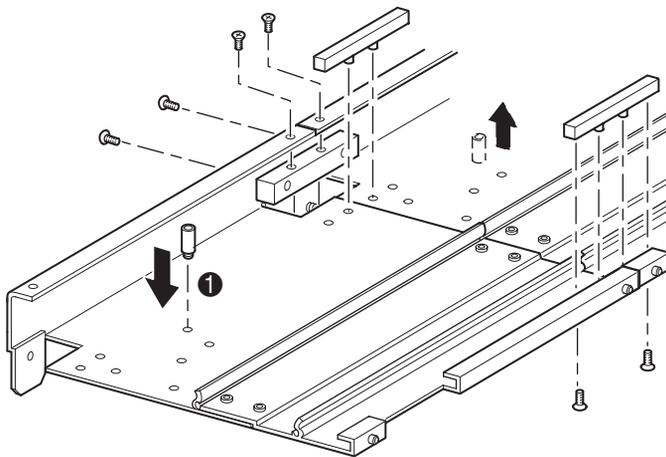


**Figure 2–18:  Installing tie bars**

10. Repeat step 9 for each extension.

11. Remove the bottom stop standoff from the PTM base unit and then attach it to the corresponding mounting hole (❶, Figure 2–18) in the last unit of the extended PTM.

12. Secure the belt tensioner ramp and idler pulley to the extension using the two previously removed screws (see Figure 2–16).

13. Secure the belt tensioner ramp and idler pulley springs using the two previously removed screws (see Figure 2–16).

## Installing a Longer Belt to an Extended PTM

To install an extended belt:

1. On the extension belt tensioner ramp and idler pulley base, compress the springs until the holes in the tensioner ramp are aligned with the holes in the base of the tensioner.

2. Insert a large paper clip through the holes. This sets the idler pulley to the zero position (see Figure 2–19).
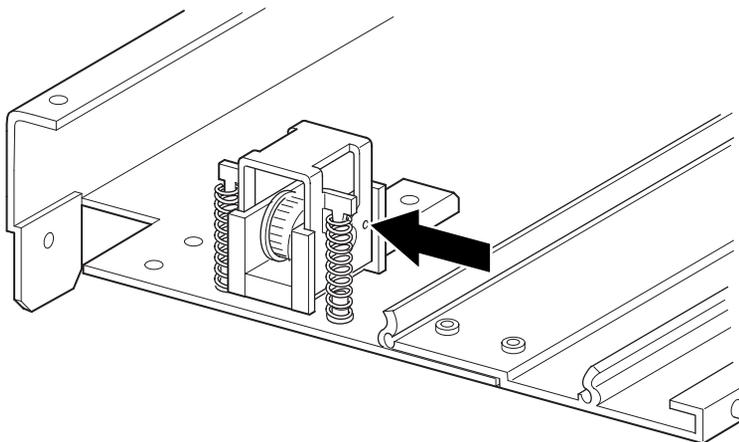


**Figure 2–19:  Tensioner ramp/idler pulley zero point**

3. Thread the timing belt through the top of the belt tensioner ramp and idler pulley and then through the motor drive pulley. Make sure the belt teeth engage both pulleys (see Figure 2–20 and Figure 2–21).
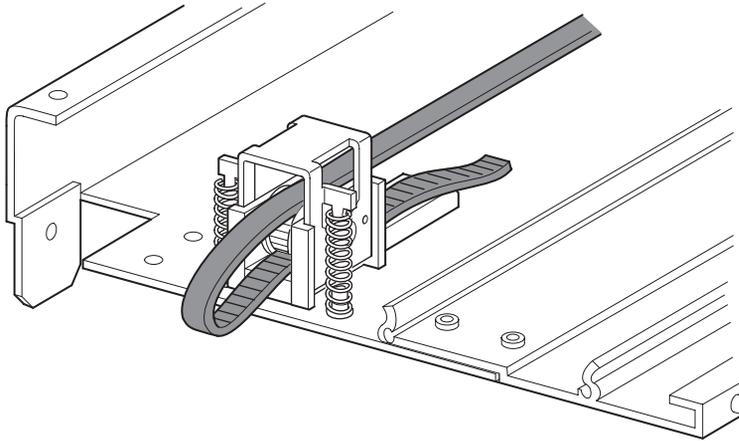


**Figure 2–20: Installing the timing belt on the extension**
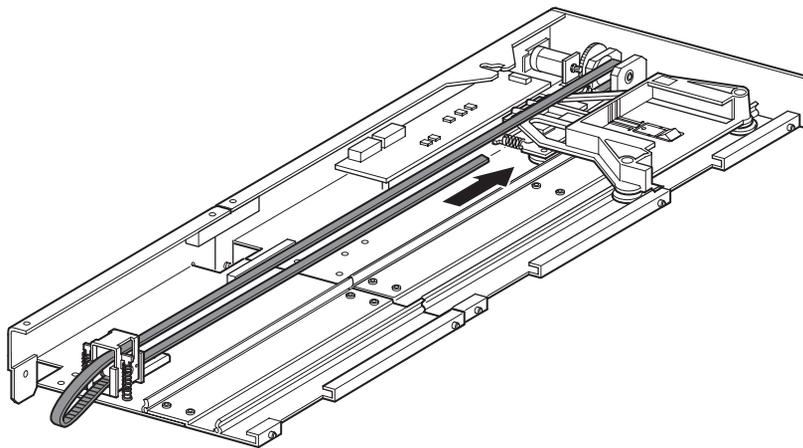


**Figure 2–21: Installing the timing belt**

4. Position the media elevator car over the belt block access cutout (see Figure 2–14).

5.  Position the ends of the timing belt under the media elevator car at the midpoint of the belt block access cutout.

6.  Turn the PTM over.

⚠ **CAUTION:** To prevent damage to the PTM media elevator car it must be supported from underneath any time you are performing procedures on the belt block bracket assembly.

7.  Place the timing belt ends on the belt block (see Figure 2–22).
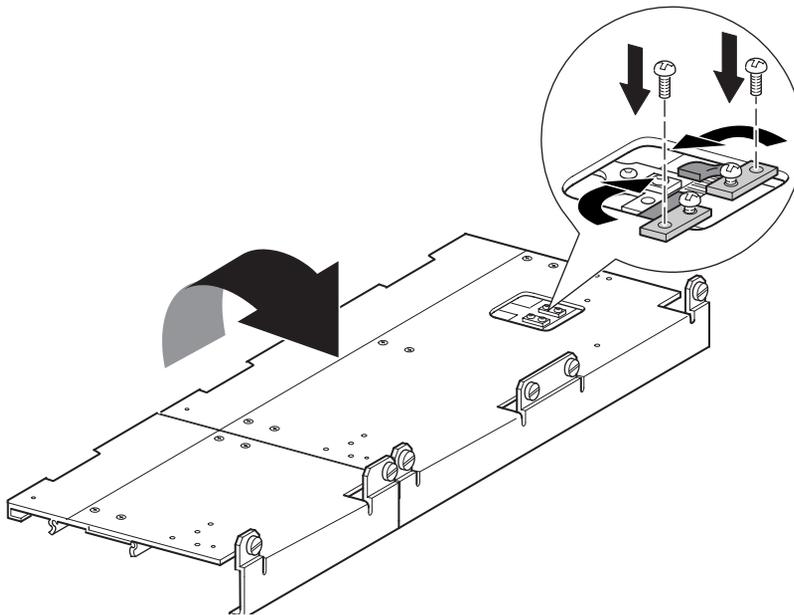


**Figure 2–22:  Timing belt at the belt block**

8.  Use diagonal cutting pliers to cut the drive belt. If the belt was sized properly, a small space between the belt ends should be visible.

9.  Secure the timing belt with the two belt brackets and four retaining screws.

    **NOTE:** Secure the timing belt at the top first.

10. Remove the previously inserted large paper clip to automatically set initial belt tension.

11. Install the bottom plate that was previously removed from the PTM base unit using the previously removed retaining screws (see Figure 2–23).
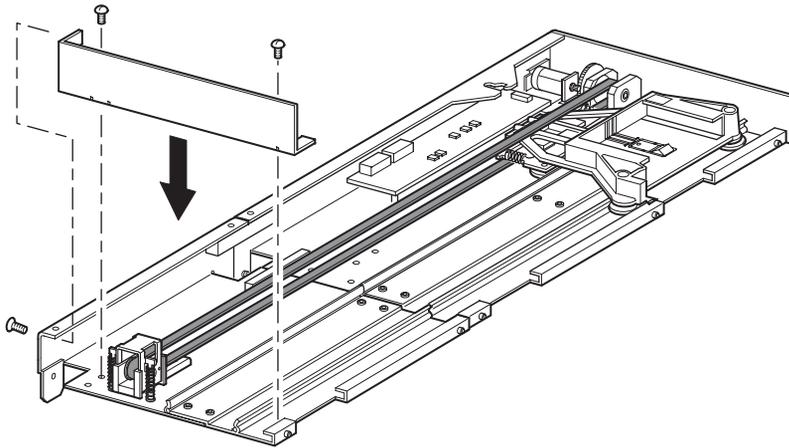


**Figure 2–23:  Installing the bottom plate**

# Installing the Extended PTM

To install the extended PTM:

1. Use the handle while supporting the PTM base unit from the bottom (see Figure 2–9).

2. Carefully insert the extended PTM into the top library making sure the top pins are fully engaged.

3. Using the PTM extension thumbscrews, secure the extended PTM to the top (master) library.

   **IMPORTANT:** If the lower pins are difficult to align to the bottom (slave) libraries, push the slave libraries slightly forward. Afterwards, engage each one by pulling them (one at a time) toward the extended PTM and then tighten the appropriate thumbscrews.

   **NOTE:** On MSL5052/SML5060 libraries, the middle holes on the unit are not threaded and are not intended to engage the thumbscrews. The top and bottom thumbscrews secure the PTM extension to the library.

4. Using the PTM extension thumbscrews, secure the extended PTM to the remaining libraries (in sequence) for the multi-unit library configuration.

**NOTE:** If you still cannot align a bottom (slave) library to the extended PTM, slightly loosen the rear rail bracket screws for that library, reposition it, and then secure it to the extended PTM. Afterwards, re-tighten all rear rail bracket screws.

5. If required, install any previously removed drive assemblies and covers.

6. If necessary, tighten the thumbscrews at the front of the unit.

7. You can now attach the data cables to the extended PTM. See the section on "Cabling the PTM and LAN Hub," described later in this chapter.

# Cabling the PTM and LAN Hub

This section describes how to connect the data cables to the PTM and LAN hub in a multi-unit library configuration (single master and slave).

△ **CAUTION:** Do not apply power to any library until cabling is complete. Attempting to connect or disconnect a PTM to a library that has power applied can damage the library and the PTM PCB.

After connecting all the appropriate data cables, see Chapter 3, "Configuring the PTM," for detailed information about configuring the PTM using the GUI touch screen.

## Multi-Unit Library Configuration (Single Master and Slave)

Figure 2–24 shows how to connect a multi-unit library configuration using a single master and a slave library configuration.

**IMPORTANT:** All libraries must be powered off.

**NOTE:** Refer to Appendix E of the *hp StorageWorks MSL5000 Series Library User Guide* for for information on connecting SCSI cables and SCSI terminators to fit your specific needs and additional multi-unit library and SCSI configuration information.
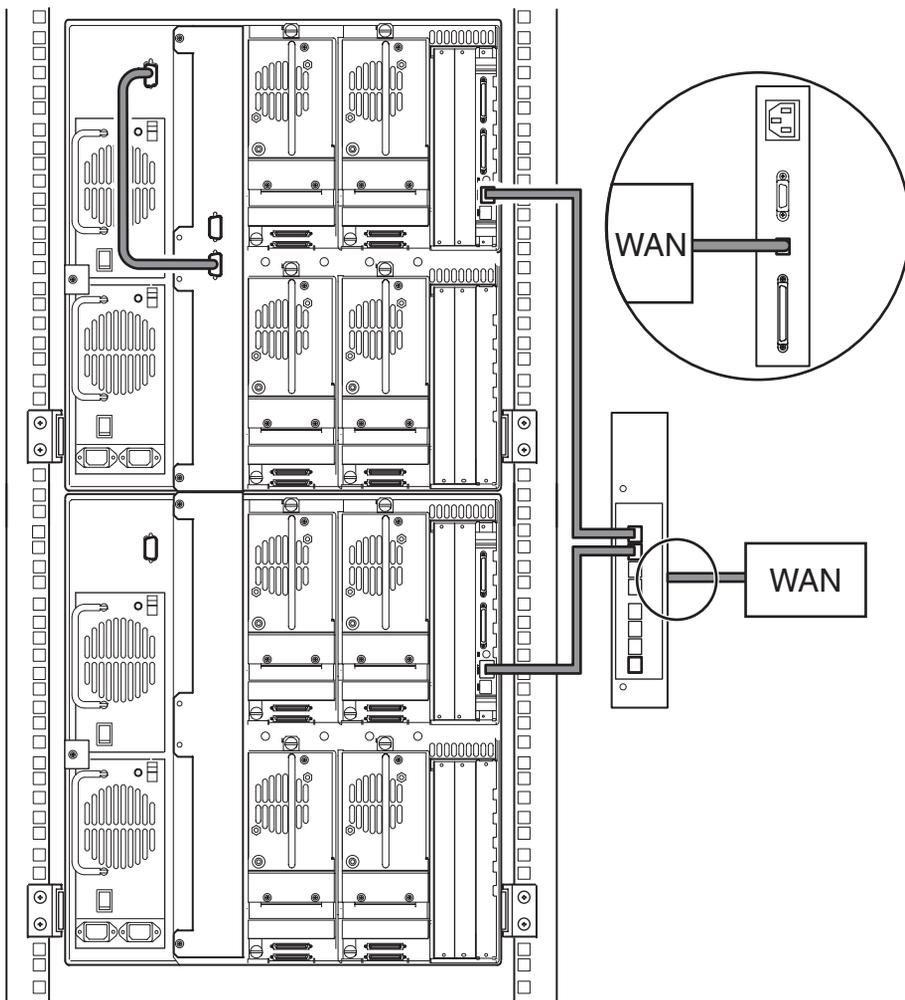
**Figure 2–24:  MSL5052/MSL5060 multi-unit library configuration (single master and slave)**

**IMPORTANT:**  Additional slaves require an extended PTM system. See the sections on "Adding Extensions to a PTM Base Unit," "Installing a Longer Belt to an Extended PTM," and "Installing the Extended PTM."

# 3

# Configuring the PTM

After the Pass-Through Mechanism (PTM) has been successfully installed, the libraries must be configured to operate correctly as a multi-unit library configuration.

**NOTE:** The master library has a fully functional GUI. Slave libraries only have partial GUI capabilities.

Before configuring the libraries:

1. Make sure the libraries are connected as described in the *hp StorageWorks MSL5000 Series Library User Guide*.

2. Power on the LAN hub.

3. Turn the libraries on and wait until the Power-On Self Test (POST) completes and the Compaq Initialization or Status screen appears on the display. Refer to the *hp StorageWorks MSL5000 Series Library User Guide* for detailed instructions on power-up procedures.

# Configuring the Master Library

1. Using the Graphical User Interface (GUI) touch screen on the master library, touch the Menu button from the Status screen (see Figure 3–1). Refer to the *hp StorageWorks MSL5000 Series Library User Guide* for instructions on how to operate the GUI touch screen.

**IMPORTANT:** For libraries using 2.xx firmware, libraries previously configured as slaves must be changed to a standalone first, then configured as a master, or update the firmware to 4.04.



**Figure 3–1: Library status screen (MSL5052 shown)**

2. Touch the Library button from the Edit Options area of the GUI (see Figure 3–2).
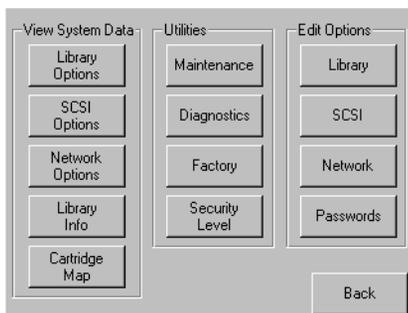


**Figure 3–2: Menu screen**

**IMPORTANT:** The library status LED indicator flashes green to indicate that a change is being made on the GUI that interrupts the current library operation.

3. Enter the appropriate Service password and then touch the Validate button. Refer to the *hp StorageWorks MSL5000 Series Library User Guide* for additional information on setting passwords.

4. Press the down arrow (▼) until the Module Configuration menu option appears on the bottom of the display (see Figure 3–3).

   **NOTE:** You can move to the next sequential Library options screen by touching the down arrow (▼). To return to the previous Library options screen, touch the up arrow (▲) or Back button to return to the Menu screen.
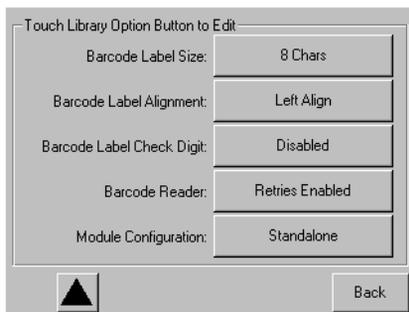


**Figure 3–3: Module Configuration select screen**

5. Touch the button next to the Module Configuration menu option and then touch the Master button (see Figure 3–4).
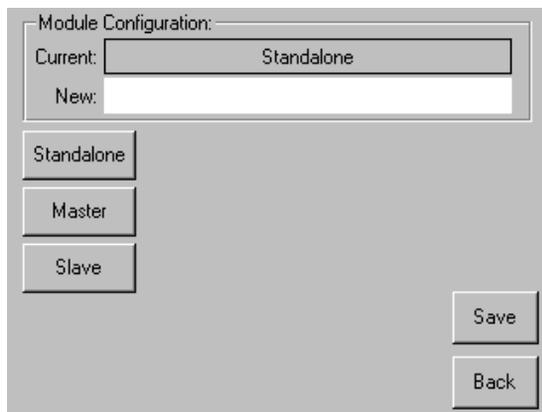


**Figure 3–4: Module Configuration screen**

6. Touch the Save button to confirm your request.

7. Touch OK to save the new option. Afterwards, the library will automatically reboot and be configured for the new option (see Figure 3–5).

   **NOTE:** After the library reboots, the library status LED indicator lights solid green indicating that the library is now fully operational.



**Figure 3–5: Module Configuration Confirmation screen**

# Configuring the Slave Libraries

To configure the remaining libraries as slaves:

1. Using the GUI touch screen on a standalone library in a rack enclosure, touch the Menu button from the Status screen (see Figure 3–1).

2. Touch the Library button from the Edit Options area of the GUI (see Figure 3–2).

   **IMPORTANT:** The library status LED indicator flashes green to indicate that a change is being made on the GUI that interrupts the current library operation.

3. Enter the appropriate Service password and then touch the Validate button. Refer to the *hp StorageWorks MSL5000 Series Library User Guide* for additional information on setting passwords.

4. Touch the down arrow (▼) until the Module Configuration menu option appears on the bottom of the display (see Figure 3–3).

   **NOTE:** You can move to the next sequential Library options screen by touching the down arrow (▼). To return to the previous Library options screen, touch the up arrow (▲) or Back button to return to the Menu screen.

5. Touch the button next to the Module Configuration menu option and then touch the Slave button (see Figure 3–4).

6. Touch the Save button to confirm your request.

7. Touch OK to save the new option. Afterwards, the library will automatically reboot and be configured for the new option (see Figure 3–5).

   **NOTE:** After the library reboots, the library status LED indicator lights solid green indicating that the library is now fully operational.

8. Repeat this procedure to configure the remaining libraries as slaves.

The multi-unit library configuration is now ready to verify firmware. Refer to the *hp StorageWorks MSL5000 Series Library User Guide* for operating instructions.

# Verifying the Configuration

To verify the configuraiton, run the cartridge cycle diagnostic:

1. Load several cartridges into the master unit.

2. Touch Menu on the master GUI Status Screen.

3. Touch Diagnostics (in the Utilities area).

4. Enter the appropriate password, if necessary, and validate.

5. Touch Cartridge Cycle.  The Cartridge Cycle diagnostic screen is displayed.
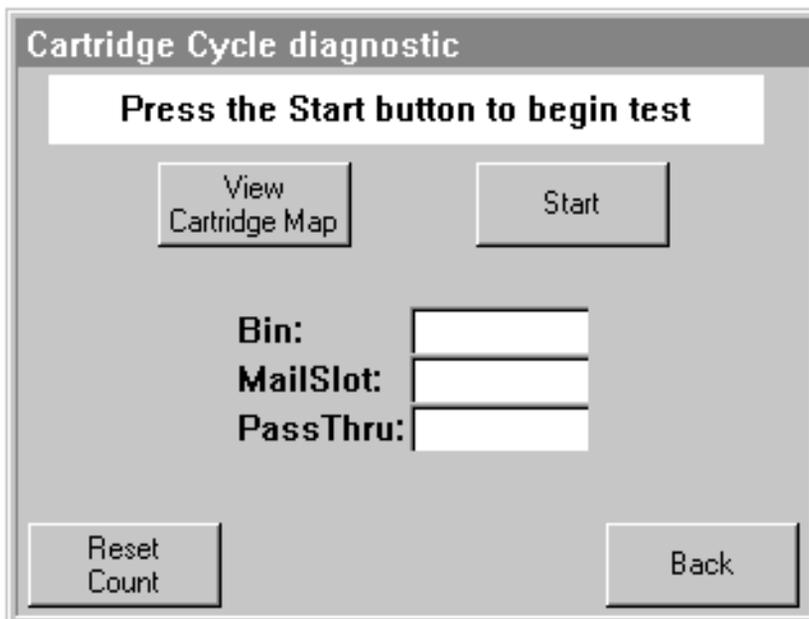


**Figure 3–6:  Cartridge Cycle diagnostic screen**

6. Touch Start to begin testing. The message "Test is running" will display.

7. Touch Stop (intially the Start button) to end the diagnostic.

# Converting a Multi-Unit Library Configuration to Standalone Configuration

If you are converting a multi-unit library configuration to a standalone configuration, it is beneficial to do so in the following order:

1. Convert the slave unit(s) to standalone.

2. Convert the master unit to standalone.

3. Power off all libraries.

⚠ **CAUTION:** All libraries must be powered off before disconnecting the motor cable. Failure to do so will damage the library and PTM.

4. Remove the PTM motor cable.

# Verifying the Firmware Level

The recommended minimum firmware level required for a multi-unit library configuration is 3.19 for DLT only libraries, or 4.04 for LTO Ultrium-compatible libraries.

To verify the firmware level of the master:

1. Apply power to the library:

   a. Connect each supplied power cord to each power supply receptacle.

   b. Toggle each power switch on.

   c. Press anywhere on the GUI touch screen to activate the display and power on the library.

   **NOTE:** Refer to Chapter 2 of the *hp StorageWorks MSL5000 Series Library User Guide* for additional information on applying power to a library.

2. After POST completes, touch Menu.

3. Touch Library Info in the View System Data area.

4. The firmware revision appears in the Miscellaneous Library Info screen.

5. If required, update the master to the correct firmware level.

   **NOTE:** After the master is updated, any attached slaves are then automatically updated.

# Updating the Firmware

Each MSL5000 in a multi-unit library configuration can be flashed individually, using the Remote Management Interface or the *MSL5000Util.exe* diagnostic utility and diagnostic cable.

**NOTE:** If the master is flashed first, the update will propagate to all slaves automatically per the GUI instructions.

# Updating via the Remote Management Interface

To update the firmware using the Remote Management Interface you need an Ethernet connection to the World Wide Web.

1.  Login to the Remote Management Interface.

    **NOTE:** See the *hp StorageWorks MSL5000 Series Library User Guide* for additional information on setting up and using the Remote Management Interface.

2.  Click Functions.

3.  Scroll down to Library Flash Operation.
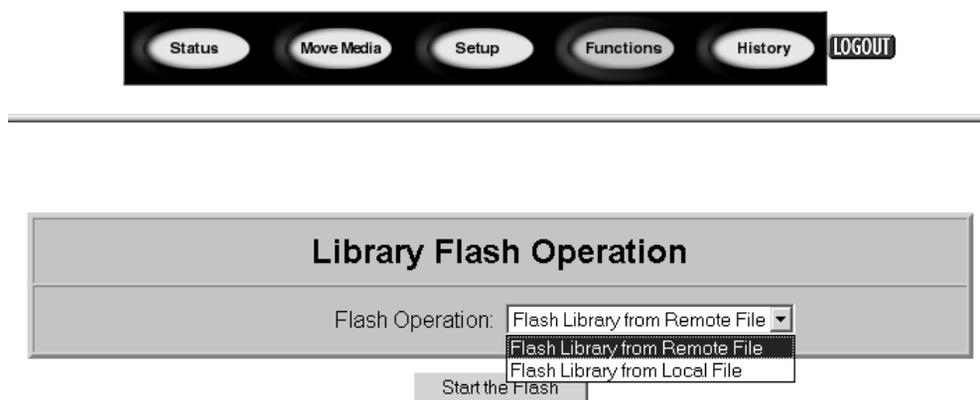


**Figure 3–7: Upgrading the firmware using the Remote Management Interface**

4.  Select Flash Library from Remote File or Flash Library from Local File.

    **NOTE:** If you select Flash Library from Local File, the *.bin file must be copied to the /upload directory, which is located on the library at the IP Address/upload.

5.  Click Start the Flash. The library firmware automatically updates.

6.  The library will reboot. Verify the firmware level has been updated successfully.

## Updating Via Serial Connection

To update the firmware using the *MSL5000Util.exe* you will need:

- *MSL5000Util.exe* and the proper version of firmware, available for download from the HP website at http://www.compaq.com/storage/tape_index.html

- RS-232 cable assembly, serial RJ11 to DB9 connectors

- PC with available serial port

## Firmware Flashing Procedure

1. Install the *MSL5000Util.exe* on the PC.

2. Copy the firmware image (*\*.bin*) into the same directory that the *MSL5000Util.exe* was installed.

3. Connect the libraries diagnostic port to the PC using supplied cable assembly.

4. Start the *MSL5000Util.exe*.

5. Click **Connect**, select the PC serial port that the cable assembly is connected to, and then click **OK**.

6. Click **Download>Browse**. Navigate to the directory with the firmware image *.bin.

7. Click **OK**. The library firmware automatically updates.

   **IMPORTANT:** If the flash process does not complete, select a lower baud rate option, available under the Connect window, and try again.

8. The library will reboot. Verify the firmware level has been updated successfully.

# A

## Regulatory Compliance Notices

## Federal Communications Commission Notice

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

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

### Class A Equipment

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 instructions, 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 personal expense.

# Class B Equipment

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

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio or television technician for help.

# Modifications

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

# Cables

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

## Declaration of Conformity for products marked with the FCC logo - United States only

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

For questions regarding your product, contact:

Hewlett-Packard Company

P. O. Box 692000, Mail Stop 530113

Houston, Texas 77269-2000

Or, call

1-800- 652-6672

For questions regarding this FCC declaration, contact:

Hewlett-Packard Company

P. O. Box 692000, Mail Stop 510101

Houston, Texas 77269-2000

Or, call

(281) 514-3333

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

# Canadian Notice (Avis Canadien)

## Class A Equipment

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

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

## Class B Equipment

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

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

# European Union Notice

$\mathsf{C}\,\mathsf{E}$

Products bearing the CE marking comply with the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community and if this product has telecommunication functionality, the R&TTE Directive (1999/5/EC).

Compliance with these directives implies conformity to the following European Norms (in parentheses are the equivalent international standards and regulations):

- EN 55022 (CISPR 22) - Electromagnetic Interference
- EN55024 (IEC61000-4-2, 3, 4, 5, 6, 8, 11) - Electromagnetic Immunity
- EN61000-3-2 (IEC61000-3-2) - Power Line Harmonics
- EN61000-3-3 (IEC61000-3-3) - Power Line Flicker
- EN 60950 (IEC 60950) - Product Safety

# Taiwan Notice

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

# Japanese Notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文を
お読み下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準
に基づくクラスB情報技術装置です。この装置は、家庭環境で使用すること
を目的としていますが、この装置がラジオやテレビジョン受信機に近接して
使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

VCCIマークが付いていない場合には、次の点にご注意下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に
基づくクラスA情報技術装置です　この装置を家庭環境で使用すると電波
妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ず
るよう要求されることがあります。

# B

# Electrostatic Discharge

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

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.

- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.

- Place parts on a grounded surface before removing them from their containers.

- Avoid touching pins, leads, or circuitry.

- Always be properly grounded when touching a static-sensitive component or assembly.

# Grounding Methods

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

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

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

- Use conductive field service tools.

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

If you do not have any of the suggested equipment for proper grounding, have a Compaq authorized reseller install the part.

**NOTE:** For more information on static electricity, or for assistance with product installation, contact your HP authorized reseller.

# Index