System Memory Upgrade Guide

D Class and R Class

HP 9000 Enterprise Servers

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NOTE

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Who Should Use this Guide

The procedures in this guide are intended to be performed by a person who is qualified in the installation and servicing of computer equipment, and is trained to recognize the hazards involved. Memory is installed in an area of the product where energy levels considered hazardous may be produced.

D Class System Memory Upgrade

Overview of Memory Installation

The memory installation procedures are organized as follows:

A. Check existing system memory.

B. Turn off power to the system.

C. Remove the front bezel.

D. Remove the side panel.

E. Remove the EMI cover.

F. Remove the Processor/Memory card.

G. Plan the memory configuration.

H. Install memory modules.

I. Replace the Processor/Memory card.

J. Replace the EMI cover.

K. Replace the side panel.

L. Replace the front bezel.

After completing all installation procedures, proceed to the **Memory Upgrade Verification** procedure (located after the installation procedures) for instructions on how to verify correct installation. If the memory verification is not successful, refer to the section titled **Troubleshooting Memory Configuration Error Symptoms** at the end of this manual.

Required Tools

To perform the procedures in this upgrade guide, the following tools are required:

- Small flat-bladed screwdriver
- Torx driver, #15
- Phillips screwdriver.

Safety Considerations

WARNING

The installation procedures in this guide require opening the system cabinet, which may expose you to high-energy (high-amperage) circuits, possible ejection of molten metal, and exposed sharp edges in equipment chassis. Be sure to remove all rings, watches, and other jewelry from fingers, wrists, and arms before opening the system cabinet.

Electrostatic Discharge Precautions

Electrostatic discharge can damage the integrated circuits on printed-circuit boards. To prevent such damage from occurring, be sure to observe the following precautions when handling and installing boards:

1. Use a grounding mat and an anti-static wrist strap, such as those included in the ESD Field Service Kit (HP P/N A3024-80004).
2. Wear the anti-static wrist strap to ensure that any accumulated electrostatic charge is discharged from you body to ground.
3. Keep uninstalled printed-circuit boards in their protective anti-static bags until you are ready to install them.
4. Handle printed-circuit boards by their edges after you have removed them from their protective anti-static bags.

Memory Installation Procedure

A. Check Existing System Memory

To check the memory configuration on your system:

Reboot the system by typing */etc/shutdown -r* at the HP-UX system prompt:

```
/etc/shutdown -r
```

When prompted, halt the boot process by pressing any key on the keyboard:

```
Processor is booting from first available device.

To discontinue, press any key within 10 seconds.

Boot terminated.

Main Menu ------------------------------------------------------

Command                          Description
-------                          -----------
BOot [PRI|ALT|<path>]            Boot from specified path
PAth [PRI|ALT|CON|KEY] [<path>] Display or modify a path
SEArch [DIsplay|IPL] [<path>]    Search for boot devices
TOC                              Soft boot the system


COnfiguration [<command>]        Access Configurationmenu/commands
INformation [<command>]          Access Information menu/commands
SERvice [<command>]              Access Service menu/commands
DIsplay                          Redisplay the current menu
HElp [<menu>|<command>]          Display help for menu or command
RESET                            Restart the system

-------
Main Menu: Enter command >
```

At the Main menu of the Boot Console Handler, type “in me” to display memory information.

Note the amount of memory listed in the memory information display. After installing additional memory, you will check this memory information display again to verify that the system recognizes the newly installed memory

Example Memory Information Display (Models D200/D210/D310)

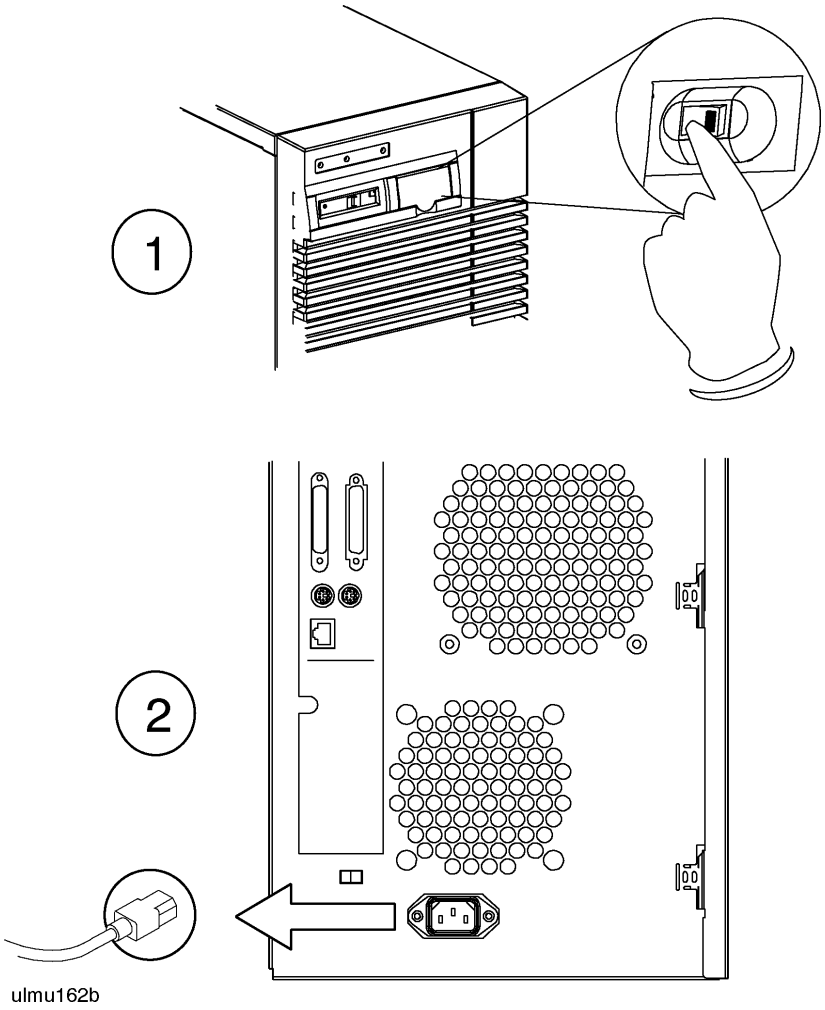
```
Main Menu: Enter command > in me

MEMORY INFORMATION

   Slot              Card Size        Amount Enabled
   ----              ---------        --------------
    0                16 MB            16 MB
    1                16 MB            16 MB


  Physical Memory:      32 MB      (0x02000000)
  Configured Memory:    32 MB      (0x02000000)


Main Menu: Enter command >
```

Example Memory Information Display (all other D2xx and D3xx Models)

```
Main Menu: Enter command > in me

MEMORY INFORMATION

   MEMORY STATUS TABLE

   Slot     Size(a+b)     Status
   ----     --------      ------
   0a/b      128MB       Configured
   1a/b       32MB       Configured
   2a/b       32MB       Configured
            --------
   TOTAL      192MB
```

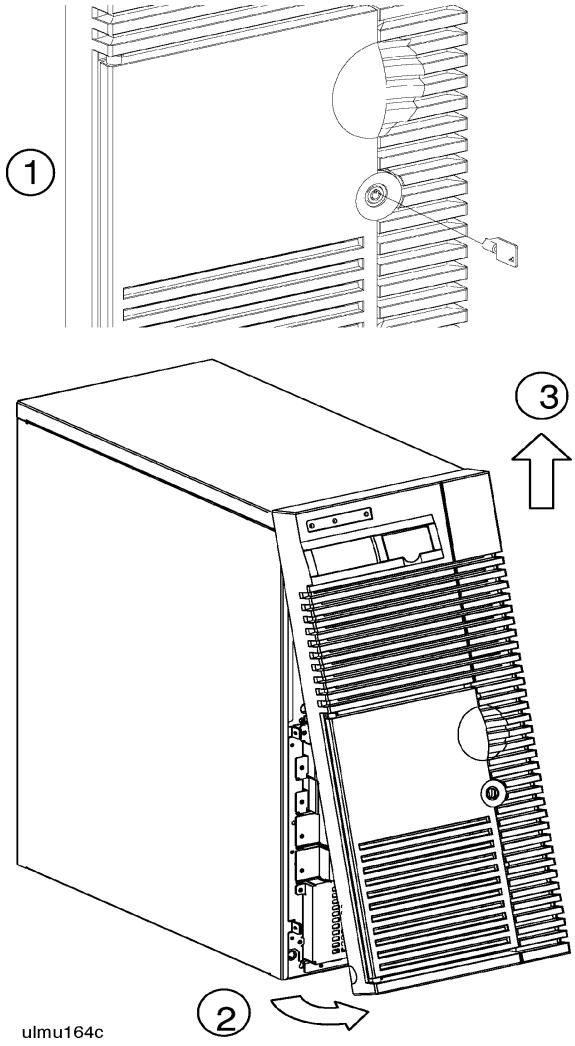
B. Turn Off Power to the System

1. Set the Power switch on the server front panel to the OFF position.
2. Disconnect the AC power cord from the system cabinet.



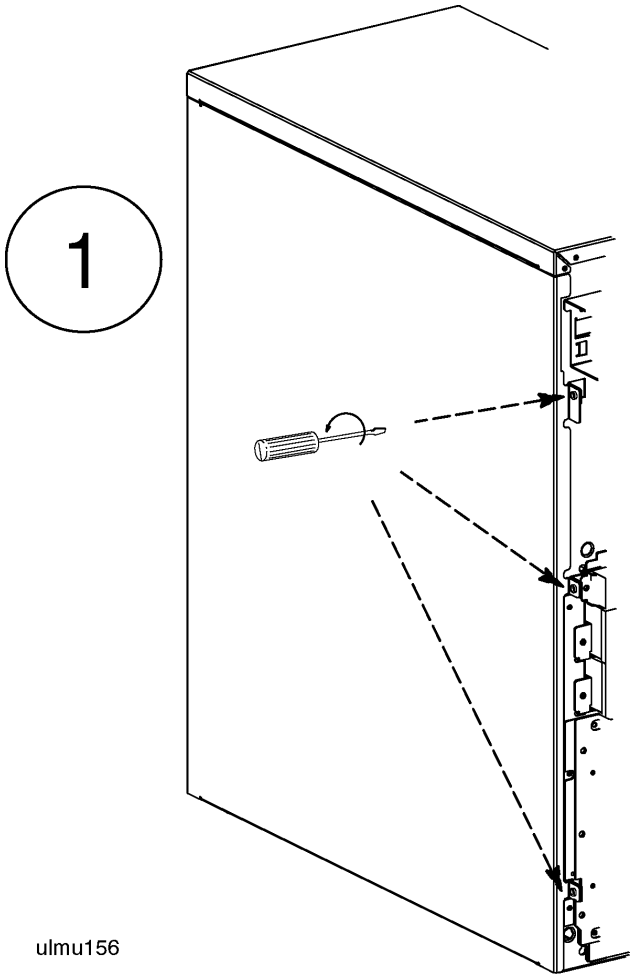
C. Remove the Front Bezel

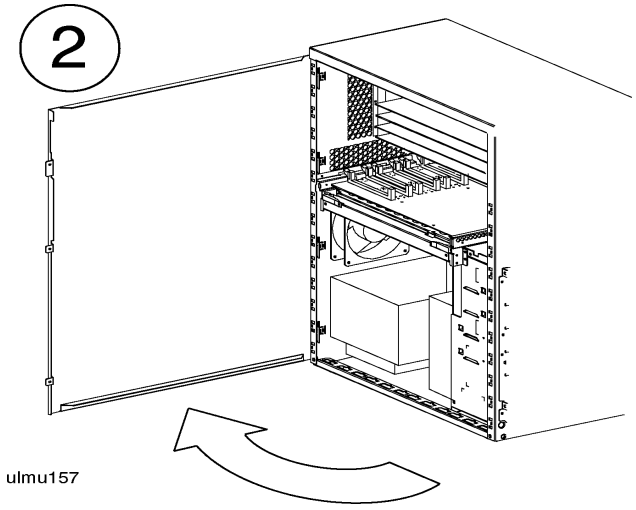
1. Unlock the front peripheral door using the key that was shipped with your server.
2. Grab the bottom sides of the front bezel, and pull the bottom of the bezel slightly out from the cabinet.
3. Carefully push the bezel up so that the top of the bezel comes loose from the top of the cabinet, then pull the bezel away from the cabinet.



D. Remove the Side Panel

1. Loosen three captive side panel screws with a #15 Torx driver.
2. Grasp the front edge of the side panel and swing it away from the system cabinet.
3. Remove the panel by lifting it up so that its four hinge tabs come out of the slots at the rear of the cabinet.
4. Carefully set the panel aside.

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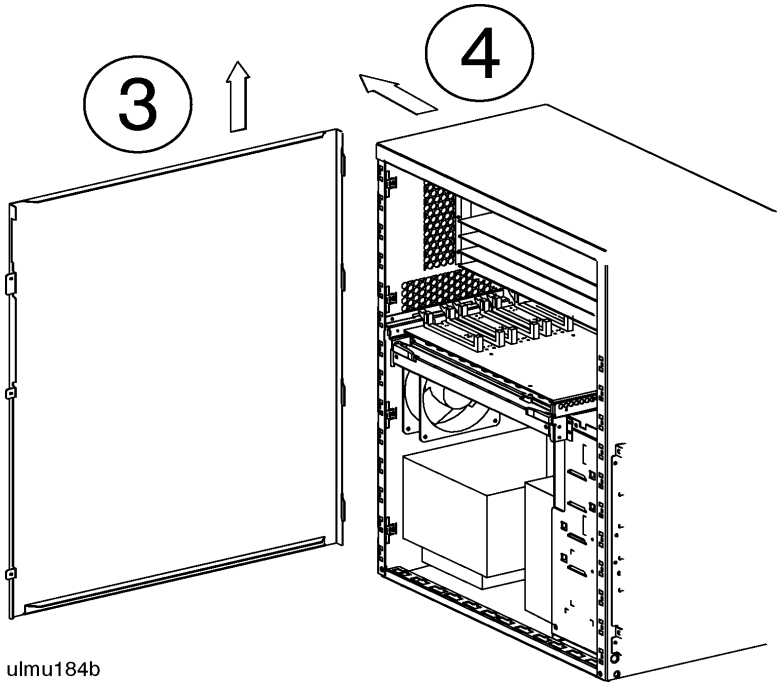
3
4
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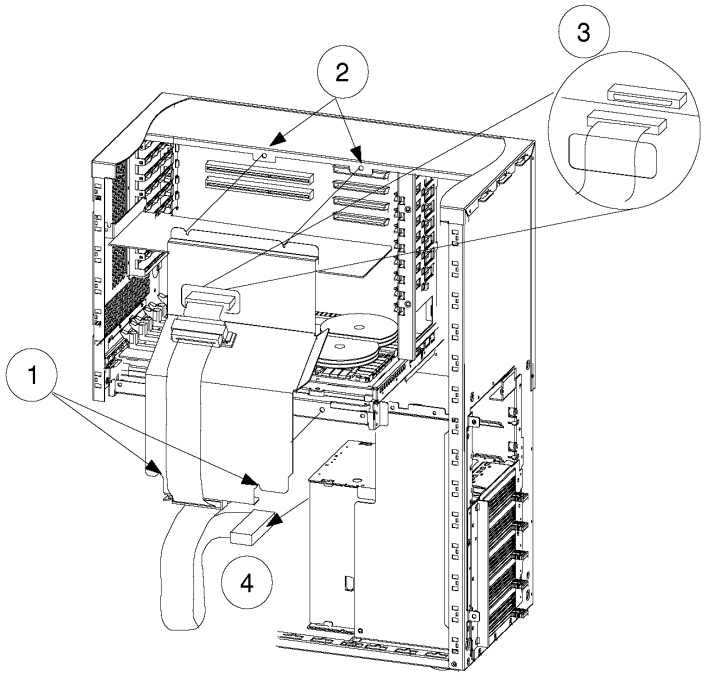
E. Remove the EMI Cover

D Class servers that have the Hot-Swap Module installed will have an EMI cover installed over the Processor/Memory card. To remove the EMI cover:

1. Loosen the two notches at the bottom of the EMI cover from the tabs on the Processor/Memory card by pushing up and slightly flexing the EMI cover until the notches come loose.
2. Pull the EMI cover down slightly until the two notches at the top of the cover come loose from the tabs at the top of the server cabinet.
3. Loosen and remove the SCSI ribbon cable from the Fast/Wide SCSI card.
4. Remove the other end of the SCSI ribbon cable from the connector on the hot-swap backplane, and set the EMI cover and ribbon cable aside.



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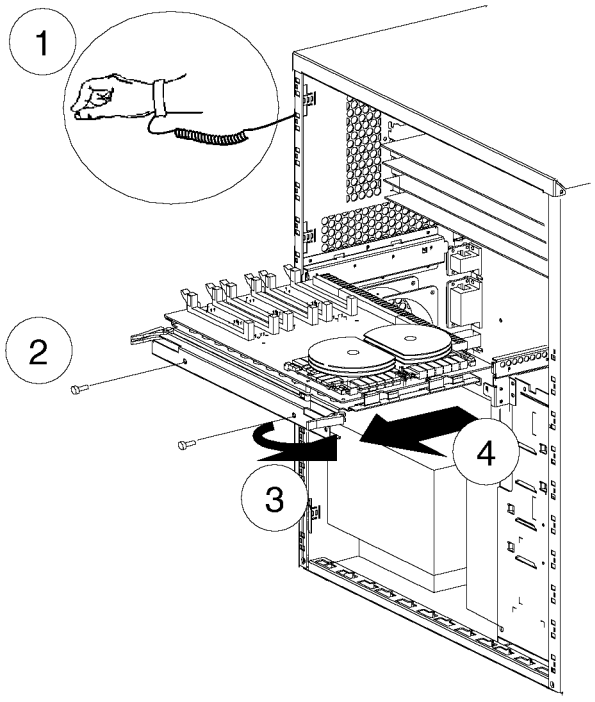
F. Remove the Processor/ Memory Card

1. Attach an anti-static strap to your wrist, and ground it to the main chassis.
2. Loosen and remove the two (2) screws that secure the Processor/Memory card to the chassis.
3. Pull out the two plastic levers on the Processor/Memory card.
4. Pull the Processor/Memory card out of the system cabinet, and set it down on an anti-static mat.



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G. Plan the Memory Configuration

Before you begin, you should understand the following definitions:

A *SIMM* (Single In-line Memory Module) is a single memory Printed Circuit Assembly (PCA) or memory board. SIMMs have memory on one side of the PCA only. All SIMMs have their size marked on the board near the upper left corner.

A *DIMM* (Dual In-line Memory Module) is a single memory PCA with memory on both sides of the PCA. All DIMMs have their size marked on the board near the upper left corner, also.

A *module* is a pair of SIMMs or DIMMs. Memory for your system is purchased and installed only in modules; **never install just one SIMM**.

NOTE The acronym SIMM is used throughout this document to indicate either SIMM or DIMM.

Plan your memory configuration so that it conforms to the rules listed below.

Memory is installed in the following increments:

- 32MB memory module (two 16MB SIMMs)
- 64MB memory module (two 32MB SIMMs)
- 128MB memory module (two 64MB SIMMs)
- 256MB memory module (two 128MB SIMMs)
- 512MB memory module (two 256MB SIMMs).

NOTE The 256MB and 512MB memory size increments are not supported on the PA7100LC Processor/Memory cards (Models D200/D210/D310).

The 512MB memory size increment is supported on Dx70, Dx80, and D390 modules only. Dx20, Dx30, Dx50, and Dx60 models do not support the 512MB memory size increment at present.

Memory Rules

1. Memory must always be added as *pairs* of SIMMs or DIMMs of the same size. For example: two 16MB, two 32MB, two 64MB, two 128MB or two 256MB.
2. The largest memory SIMM pair must be installed in the lowest numbered slots, followed by the next largest memory pair in the next lowest pair of slots, until all SIMM modules are installed.
3. **Models D200/D210/D310 Only**. SIMM modules must be installed in the correct slot sequence. The first pair of SIMMs are installed in slots 0 and 1. The next SIMM pair would go into slots 2 and 3, and so on until all SIMM modules are installed. Follow rule number 2.
4. **Models Dx20, Dx30, Dx50, Dx60, Dx70, Dx80, and D390 Only**. SIMM modules must be installed in the correct slot sequence. The first SIMM pair is installed in slots 0A and 0B. The next SIMM pair would go into slots 1A and 1B, and so on until all SIMM modules are installed. Follow rule number 2.
5. **All Models**. If the memory upgrade increments are larger than the existing (currently installed) memory increments, ALL memory must be removed, re-ordered, and re-installed following the rules listed in this section.

NOTE

Models D250/D260 and D350/D360 Only: To install and use the 256MB or 64MB memory modules, the computer Processor Dependent Code (PDC) must be revision 36.20 or later. To verify the PDC revision level, use the **fv** command in Boot Console Handler. Refer to the PDC Code Revision section on page 32.

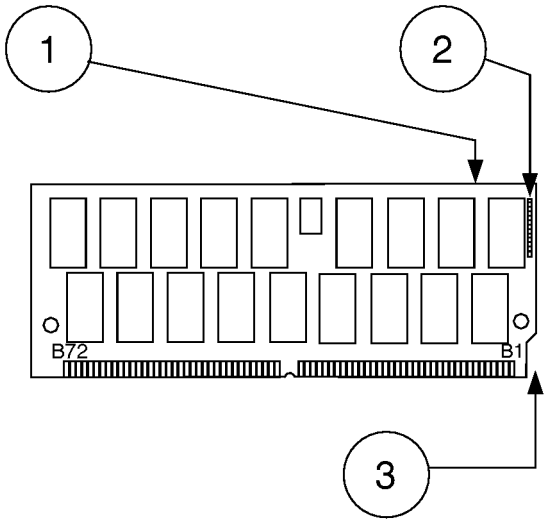
Models D200/D210/D310 Only. To install and use the 64MB memory pair, your computer PDC must be revision 36.12 or later. To verify the PDC revision level use the **fv** command in Boot Console Handler. Refer to the PDC Code Revision section on page 32.

Model Dx70 Only. To install and use the 512MB memory pair, your computer PDC must be revision 37.28 or later. To verify the PDC revision level use the **fv** command in Boot Console Handler. Refer to the PDC Code Revision section on page 32.

Memory Size and Orientation

1. Each memory SIMM (board) has its size marked on one side of the board near an upper corner: 16MB, 32MB, 64MB, 128MB, or 256MB. (In the figure shown, the marking is on the reverse side of the board.)
2. The white stripe on the end of the memory SIMM identifies the end of the board that must be toward the white ejector lever of the connector on the Processor/ Memory card.
3. The notch at the lower corner of the board also indicates the end of the board that must go toward the white ejector lever.

Memory SIMM Card Size and Orientation Markings



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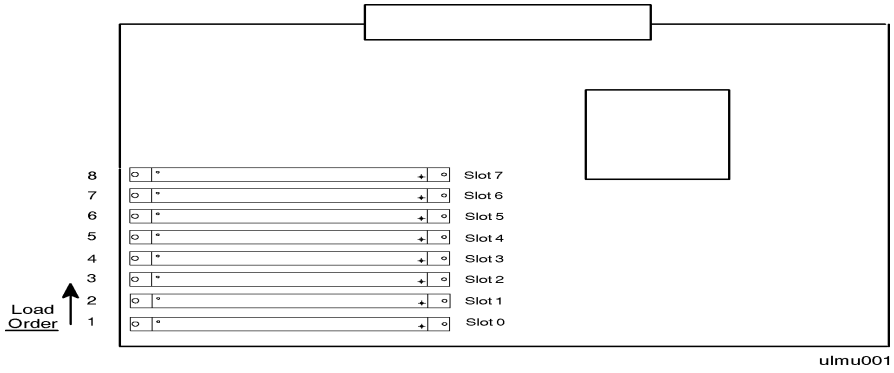
Memory Load Order for Models D200/D210/D310

Memory pair (two 16MB, two 32MB, or two 64MB SIMM cards) must be loaded onto the Processor/Memory card in the proper load order, starting with the slot marked 0, then slot 1, and so on, ending with slot 7 (see **Load Order** in the figure below).

Memory Module Load Order for Models D200/D210/D310



After you have planned your memory configuration according to the memory size, orientation, and pairing rules, proceed to step **H. Install Memory modules**.

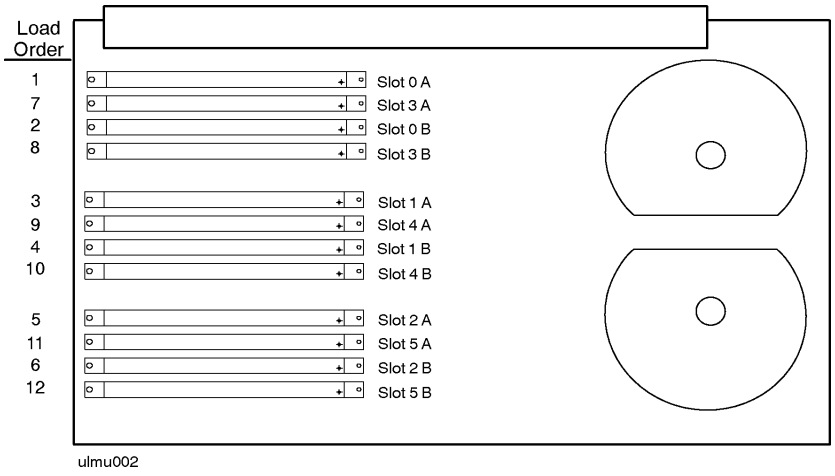
NOTE

The 256MB and 512MB memory size increments are not supported on the PA7100LC Processor/Memory cards (Models D200/D210/D310).

Memory Load Order for Models D250/D260 and D260/D360

Memory modules (two 16MB, two 32MB, two 64MB, two 128MB and two 256MB SIMM cards) must be loaded in the proper load order, starting with the slots marked 0A and 0B, then slots 1A and 1B, and so on, ending with slots 3A and 3B (see **Load Order** in the following figure). Be sure to follow the memory size, orientation, and pairing rules listed on page 12.

Memory Module Load Order for Models D250/260 and D350/360



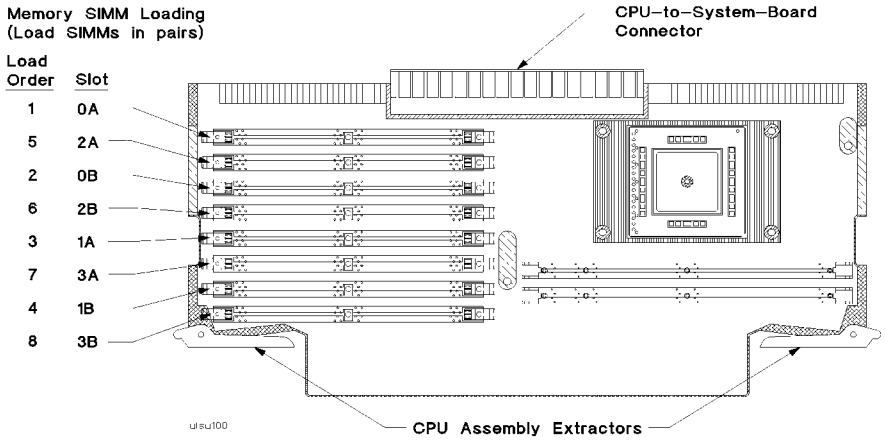
After you have planned your memory configuration according to the memory size, orientation, and pairing rules, proceed to step **H. Install Memory modules**.

Memory Load Order for Models D220/D230/D320 and D330

Memory modules (two 16MB, two 32MB, two 64MB, two 128MB and two 256MB SIMM cards) must be loaded in the proper load order, starting with the slots marked 0A and 0B, then slots 1A and 1B, and so on, ending with slots 3A and 3B (see **Load Order** in the figure below).

Be sure to follow the memory size, orientation, and pairing rules listed on page 12.

Memory Module Load Order for Models D220/D230/D320/D330

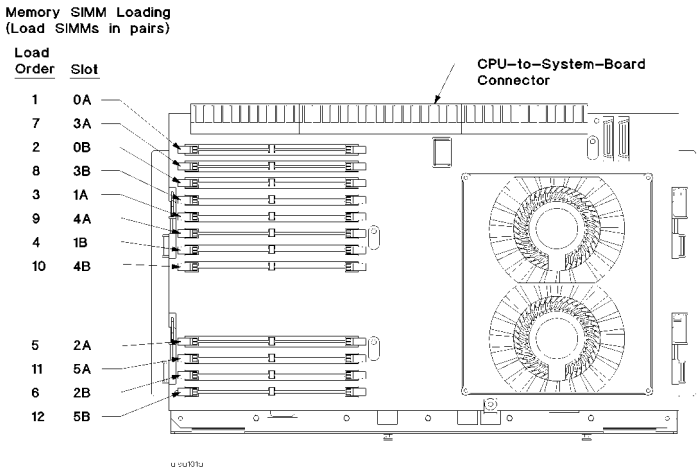


After you have planned your memory configuration according to the memory size, orientation, and pairing rules, proceed to step **H. Install Memory modules**.

Memory Load Order for Models D270/D370, D280/380, and D390

Pairs of DIMMs or SIMMs, of like size, must be loaded in the proper load order. The first and largest capacity modules starting in slots 0A and 0B, then slots 1A and 1B, and so on, ending with slots 5A and 5B (see **Load Order** in the figure below). Follow the memory size, orientation, and pairing rules listed on page 12.

Memory Module Load Order for Models D270/370 and D280/D380

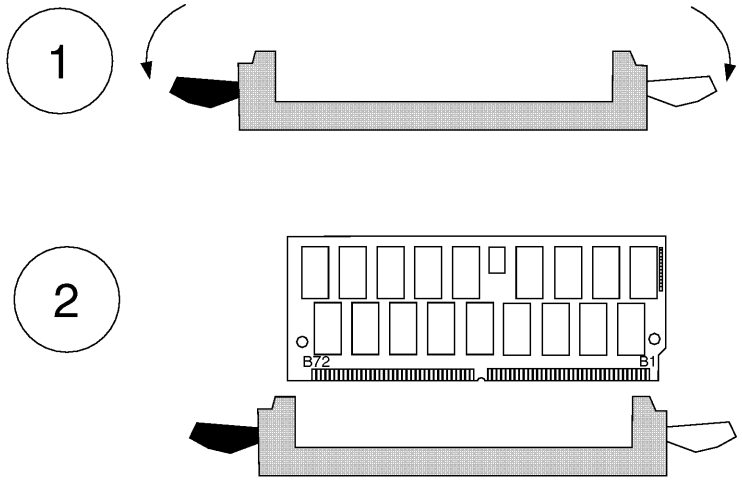


H. Install Memory modules

1. Open the ejector levers (down position).
2. Orient the memory SIMM (card) correctly, with the white stripe on the card toward the white ejector lever.
3. Insert the memory SIMM into the connector until the fingers on the card edge just touch the connector.
4. Close the ejector levers (up position).
5. Push the memory SIMM firmly and evenly into the connector until it clicks into place.

CAUTION

Be sure that an anti-static wrist strap is still attached to your wrist and grounded to the cabinet main chassis when you handle and install the memory modules.



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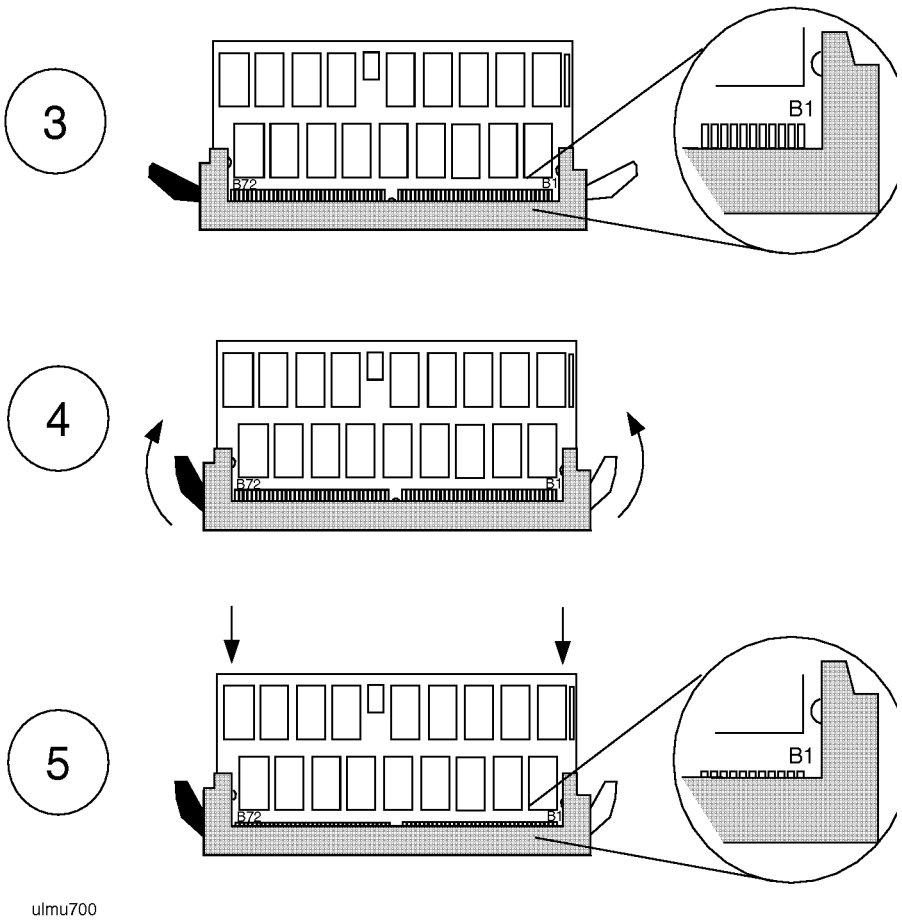

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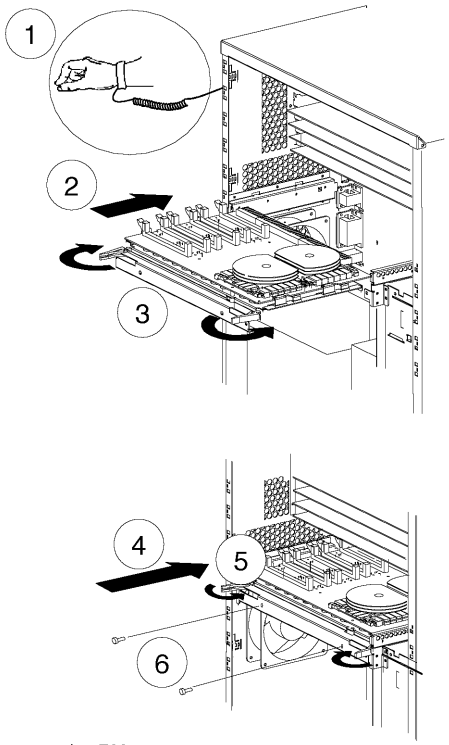
I. Replace the Processor/ Memory Card

1. Verify that an anti-static strap is still strapped to your wrist, and grounded to the cabinet main chassis.
2. Place the Processor/Memory card into the system cabinet so that the card rests on the metal rails with the large connector facing into the cabinet.
3. Pull the extractor levers on the Processor/Memory card out away from the card.
4. Slide the Processor/Memory card into the system cabinet until the large connector is properly seated in the corresponding system board connector.
5. Push in the two extractor levers on the Processor/Memory card.
6. Insert and tighten two screws to secure the Processor/Memory card in the cabinet.



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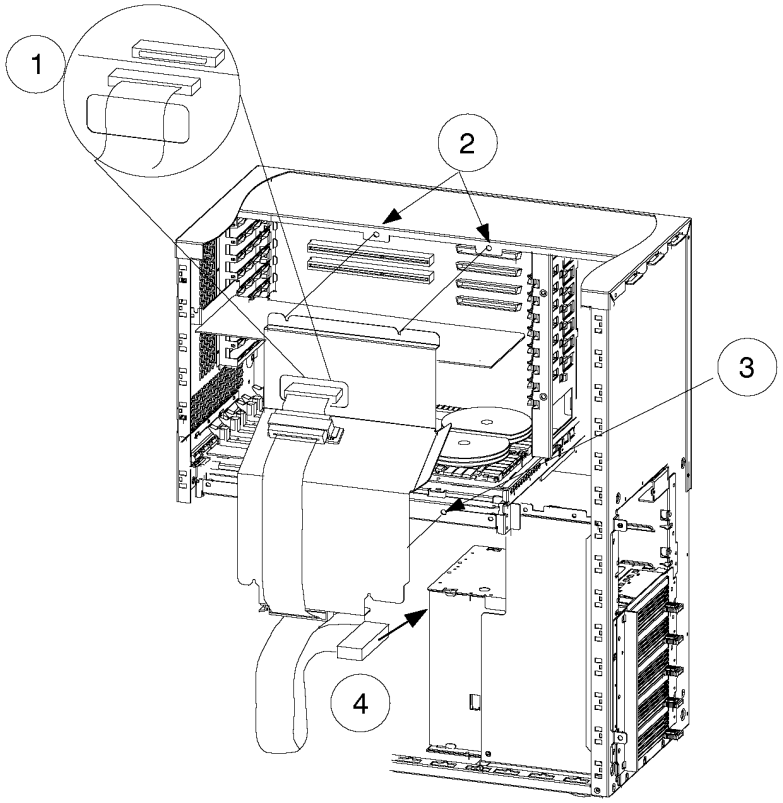
J. Replace the EMI Cover

If your server came with an EMI cover installed, and you removed it in step E, you must reinstall it. To reinstall the EMI cover:

1. Place the EMI cover and SCSI ribbon cable close enough to the upper cabinet to connect the upper end of the ribbon cable to the connector on the Fast/Wide SCSI card.
2. Insert the two upper notches of the EMI cover onto the tabs at the top of the server cabinet.
3. Flex the EMI cover slightly to insert the two notches at the bottom of the EMI cover onto the tabs of the processor/memory card.
4. Connect the lower end of the SCSI ribbon cable on the EMI cover to the backplane connector on the Hot-Swap Module.



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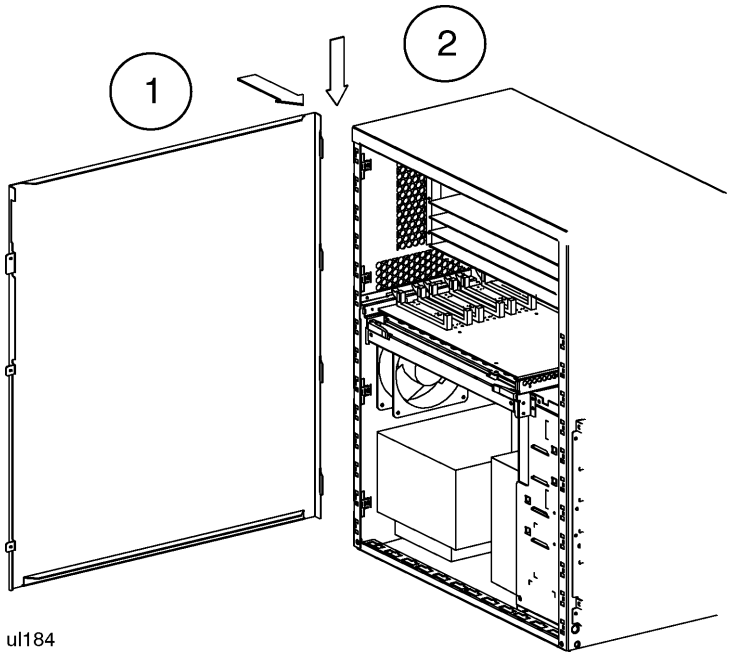
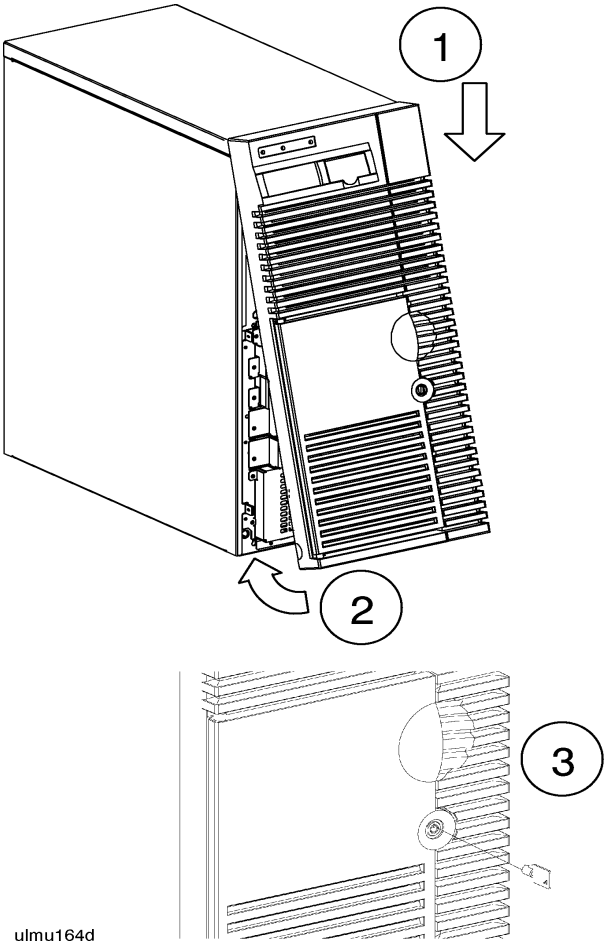
K. Replace the Side Panel

1. Position the hinge tabs of the side panel so that they go into the four slots at the rear of the system cabinet.
2. Lower the side panel until the hinge tabs are firmly resting in the slots.
3. Close the side panel.
4. Align and tighten the three captive screws of the side panel into the holes at the front of the system cabinet.



L. Replace the Front Bezel

1. Place the top of the bezel down onto the top front of the system cabinet, and press the top of the bezel down until it clicks into place.
2. Push the bottom of the bezel into the bottom of the system cabinet front until it clicks into place.
3. Lock the peripheral door.



This completes the system memory upgrade installation procedure. Proceed to the **Memory Upgrade Verification** procedure starting on the next page.

Memory Upgrade Verification

Overview

The following list is a summary of the verification process. Refer to the **Memory Upgrade Verification Procedure** below for detailed instructions.

A. Connect power cord.

B. Turn on power to the system.

C. Observe console display for self-test error messages.

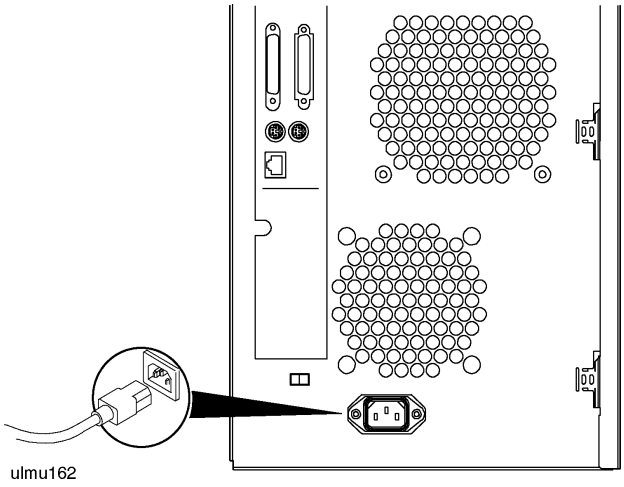
D. Halt boot process to get the Boot Console prompt.

E. Verify memory installation by running the proper Boot Console Handler process.

Memory Upgrade Verification Procedure

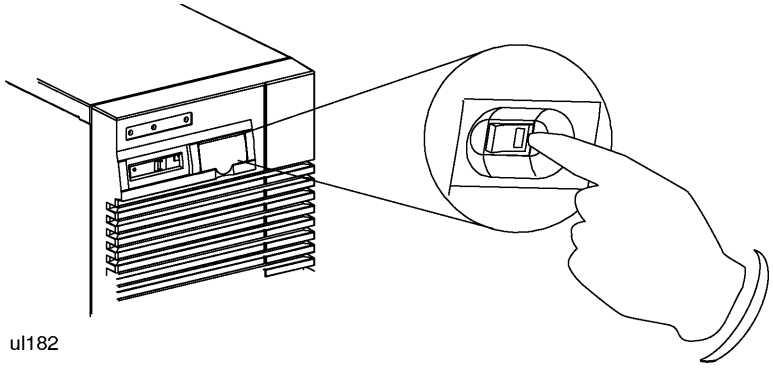
A. Connect Power Cord

Connect the power cord to the system cabinet.



B. Turn On Power to the System

Set the front panel power switch on the system cabinet to the ON position.



C. Check for Selftest Error Messages

1. Observe console display for selftest error messages.

2. If warning messages appear, write them down and refer to the section titled **Troubleshooting Configuration Error Symptoms** at the end of this manual for troubleshooting information.

D. Halt the Boot Process

If Autoboot is set to ON, you will have to interrupt the boot process to get to the Boot Console Handler, where you will have access to the commands for verifying the memory installation.When prompted by the following message, halt the boot process by pressing any key on the keyboard

```
Processor is booting from first available device.

To discontinue, press any key within 10 seconds.

Boot terminated.

-- Main Menu ------------------------------------------------

Command                     Description
-----------                 --------------------
BOot [PRI|ALT|<path>]           Boot from specified path
PAth [PRI|ALT|CON|KEY] [<path>] Display or modify a path
SEArch [DIsplay|IPL] [<path>]   Search for boot devices
TOC                             Soft boot the system

COnfiguration [<command>]   Access Configuration menu/commands
INformation [<command>]     Access Information menu/commands
SERvice [<command>]         Access Service menu/commands

DIsplay                     Redisplay the current menu
HElp [<menu>|<command>]     Display help for menu or command
RESET                       Restart the system
-------
Main Menu: Enter command >
```

E. Verify Memory Installation If successful, the following steps complete the memory installation verification. If the memory verification is not successful, refer to the section titled **Troubleshooting Memory Configuration Error Symptoms** at the end of this manual.

1. At the Main menu, type “in me” to get to display memory information.
2. Confirm that the amount of memory listed in the memory information display is equal to the amount of memory you have installed in the system.

Example Display for Models D200/ D210/D310

```
-------
Main Menu: Enter command > in me

MEMORY INFORMATION

   Slot               Card Size        Amount Enabled
   ----               ---------        --------------
    0                 16 MB            16 MB
    1                 16 MB            16 MB
    2                 16 MB            16 MB
    3                 16 MB            16 MB


   Physical Memory:    64 MB      (0x04000000)
   Configured Memory:  64 MB      (0x04000000)

Main Menu: Enter command >
```

Example Display for all Other D2xx and D3xx Models

```
Main Menu: Enter command > in me

MEMORY INFORMATION

   MEMORY STATUS TABLE

   Slot     Size(a+b)     Status
   ----     ---------     ------
   0a/b       256MB      Configured
   1a/b       128MB      Configured
   2a/b        64MB      Configured
            ---------
   TOTAL      448MB


   DETAILED MEMORY CONFIGURATION TABLE

   SPA          GROUP  SMC  SMC Status   Bank  Bank Status  Size Slot
   ---          -----  ---  ----------   ----  -----------  ---  ----
   0x00000000     0     0   Configured     1   Configured   64MB  1a/b
                        0   Configured     3   Configured   32MB  2a/b
                        1   Configured     0   Configured   32MB  2a/b
                        1   Configured     2   Configured   64MB  1a/b

   0x04000000     1     2   Configured     1   Configured  128MB  0a/b
                        2   Configured     2   Configured  128MB  0a/b

   Group 0 interleaved  4 ways over  4 banks

   Group 1 interleaved  2 ways over  2 banks


   BAD MEMORY TABLE

   SMC  SMC Status   Bank  Bank Status   SIMM Size  Slot
   ---  ----------   ----  -----------   ---------  ----
    0   Present        0   Not Present      0MB     4a/b
                       2   Not Present      0MB     5a/b
    1   Present        1   Not Present      0MB     5a/b
                       3   Not Present      0MB     4a/b
    2   Present        0   Not Present      0MB     3a/b
                       3   Not Present      OMB     3a/b
```

Troubleshooting Memory Configuration Error Symptoms

Incorrectly installed memory modules or configuration violations may result in the following symptoms when trying to verify the memory installation after power-on:

- Log warning and display hex code
- Boot command is disabled
- Console warning messages.

Possible Causes

- Memory modules not seated properly
- Memory modules not installed in the proper sequence
- Memory modules not paired
- Incorrect value matching of memory modules.

Models D200/D210/ D310

No warnings or error codes will result from incorrectly installed memory modules. If the configured memory displayed is not correct, check the installed memory pair for proper orientation, seating, and sequencing. If the problem persists, contact an HP Service Representative.

All Other D2xx and D3xx Models

Most memory configuration errors will not cause selftest to halt the system. However, warning codes and messages may be displayed on the front panel Liquid Crystal Display (LCD) and on the system console.

One or more of the following warning messages may appear on the system console.

Table 1 Console Display Messages Concerning Memory

FAULT:	**FLT 7402**; **`Both EDO and STD memory SIMMs installed`**. This message indicates an incorrect PDC code revision level. Your PDC needs to be updated. Call your response center for more information.
WARNING:	Memory has been initialized, but not tested as a result of FASTBOOT being enabled. To test memory, use the FASTBOOT command in the CONFIGURATION menu and reboot the system
WARNING:	Selftests have been disabled. System integrity is at risk. Use SELftest ON to enable selftest.
WARNING:	Memory SIMMs are not installed in the proper sequence. The BOOT command has been disabled to prevent thermal damage. refer to the memory configuration label for the proper sequence.
WARNING:	Memory configuration is not optimized for performance. Refer to the System Installation or Memory Installation manuals for memory configuration guidelines.
WARNING:	Memory has been reconfigured due to a physical change or because the Page Deallocation Table (PDT) was cleared. This is for information only. No action is required.
WARNING:	Memory banks deallocated due to a SIMM size mismatch or a SIMM failure. Refer to the “ME” command in the INFORMATION menu for error information.

To get more information about memory modules that may have been deconfigured because they were installed incorrectly, type “in me” at the Boot Console Handler. If the problem persists after checking the memory installation, contact an HP Service Representative.

PDC Code Revision You can verify the PDC revision using the Boot Console Handler (BCH). Perform the following steps to use the BCH for PDC revision checking:

1. Log on as root, and enter `reboot -r`. This command will shutdown the Operat ing System and reboot the system.
2. If autoboot is on, you will receive the following message:

   ```
   "Process is starting autoboot process

   To discontinue, press any key within 10 seconds"
   ```

   At this point, press any key within 10 seconds to interrupt the boot process.
3. The Main Menu is displayed. At the Main Menu prompt, enter **in** .
4. The Information Menu is displayed. At the Information Menu prompt, enter **fv** .

The system will respond with the current firmware revision.

For Models D200/D210/D310, the revision should be 36.12 or later. If it is not, your system will require a PDC update.

For other D2xx and 3xx models except Dx70, the revision should be 36.20 or later. If it is not, your system will require a PDC update.

For Dx70 models, the revision should be 37.28 or later. If it is not, your system will require a PDC update.

Obtaining the Correct Firmware Patch

The firmware patches for all HP 9000 Enterprise Server systems can obtained from either the HPESC (HP Electronic Support Center) via the World Wide Web, or via FTP.

Downloading the Firmware Patch via the World Wide Web

To access and download the appropriate patch, perform the following steps:

1. Connect to the HPESC World Wide Web service home page at their URL by entering the following:

   http://us-support.external.hp.com

2. Under Support Line, select the Patch Database option.
3. If you are a previously registered user:

   a. Click on “Enter as a Registered User” and select your region.

   b. Login, entering your User ID and password. This will take you to the Patch Database Main screen.

   If you are a first-time user:

   a. Click on your geographic region under “Register Now”.

   b. Review the “Terms and Conditions” page. At the bottom of the page you may accept the terms and conditions and proceed to the registration page.

   c. Complete the registration information requested.

   d. Once the registration information has been successfully transmitted, the User ID Assigned screen will appear. Write down the User ID (or print the screen) for later reference.

   e. Click on “Begin Using Patch Database Now” to proceed to the Patch Database Main screen.

4. Select the Firmware Patches option.
5. Select the CPU Patches option and click on “Show Patches”.
6. Choose the appropriate patch (for example: PF_CULL3612). A patch description will appear. Click on “download” to copy the patch to your system.

NOTE The selected patch must be downloaded from HP SupportLine onto a system that has HP-UX as the operating system.

7. Follow the instructions in the Readme file to create a bootable tape and to update PDC.

Downloading the Firmware Patch using FTP.

1. Connect to HPESC via ftp. You must initiate downloading from an open subnet system as:

   `>ftp us-support.external.hp.com`

   (If you do not have an open subnet system, try using rftp instead of ftp.)

2. Login as “anonymous”.
3. At the Password prompt, enter your e-mail address as the password.
4. Change to the directory containing the firmware patches:

   `> cd firmware_patches/hp/cpu`

   If desired, review the contents of the directory by using the **`ls`** command. For each patch, there is an accompanying text file (patchfilename.txt). The text file contains the patch description and the instructions for creating the patch tape.

5. Download the appropriate patch file and text file:

   `get <patchfilename>`

   `get <patchfilename>.txt`

6. Follow the instructions in the Readme file to create a bootable tape and to update PDC.

R Class System Memory Upgrade

Overview of Memory Installation

The memory installation procedures are organized as follows:

A. Check existing system memory.

B. Turn off power to the system.

C. Remove the top sheet metal covers.

D. Remove the EMI cover.

E. Remove the memory SIMM retainer.

F. Remove the Processor/Memory card.

G. Plan the memory configuration.

H. Install memory modules.

I. Replace the Processor/Memory card.

J. Replace the memory SIMM retainer

K. Replace the EMI cover.

L. Replace the top sheet metal covers.

After completing all installation procedures, proceed to the **Memory Upgrade Verification** procedure (located after the installation procedures) for instructions on how to verify correct installation. If the memory verification is not successful, refer to the section titled **Troubleshooting Memory Configuration Error Symptoms** at the end of this manual.

Required Tools

To perform the procedures in this upgrade guide, the following tools are required:

- Small flat-bladed screwdriver
- Torx driver, #15
- Phillips screwdriver.

Safety Considerations

WARNING

The installation procedures in this guide require opening the system cabinet. Disconnect all power to the system prior to opening the system cabinet; otherwise, personal injury may occur.

Electrostatic Discharge Precautions

Electrostatic discharge can damage the integrated circuits on printed-circuit boards. To prevent such damage from occurring, be sure to observe the following precautions when handling and installing boards:

1. Use a grounding mat and an anti-static wrist strap, such as those included in the ESD Field Service Kit (HP P/N A3024-80004).
2. Wear the anti-static wrist strap to ensure that any accumulated electrostatic charge is discharged from you body to ground.
3. Keep uninstalled printed-circuit boards in their protective anti-static bags until you are ready to install them.
4. Handle printed-circuit boards by their edges after you have removed them from their protective anti-static bags.

Memory Installation Procedure

A. Check Existing System Memory

To check the memory configuration on your system:

Reboot the system by typing */etc/shutdown -r* at the HP-UX system prompt:

```
/etc/shutdown -r
```

When prompted, halt the boot process by pressing any key on the keyboard:

```
Processor is booting from first available device.

To discontinue, press any key within 10 seconds.

Boot terminated.

Main Menu ------------------------------------------------------

Command                          Description
-------                          -----------
BOot [PRI|ALT|<path>]            Boot from specified path
PAth [PRI|ALT|CON|KEY] [<path>] Display or modify a path
SEArch [DIsplay|IPL] [<path>]    Search for boot devices
TOC                              Soft boot the system


COnfiguration [<command>]        Access Configurationmenu/commands
INformation [<command>]          Access Information menu/commands
SERvice [<command>]              Access Service menu/commands
DIsplay                          Redisplay the current menu
HElp [<menu>|<command>]          Display help for menu or command
RESET                            Restart the system

-------
Main Menu: Enter command >
```

At the Main menu of the Boot Console Handler, type “in me” to display memory information.

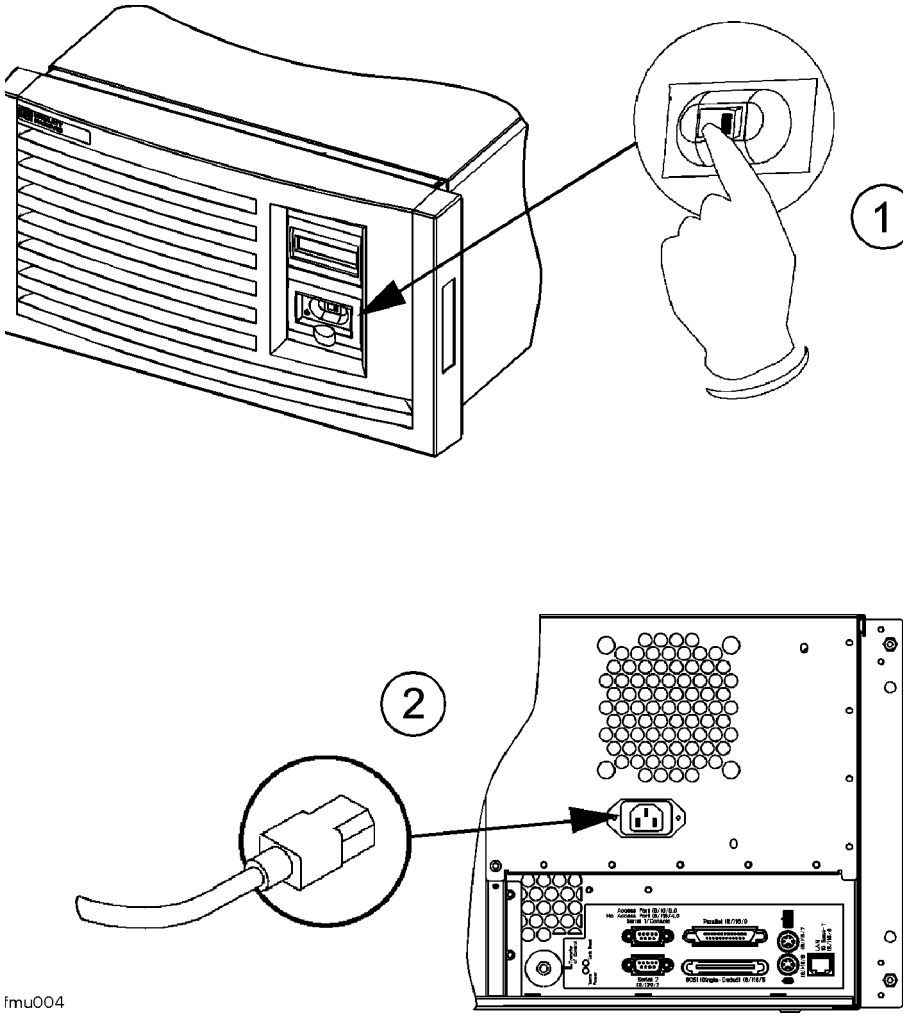
Note the amount of memory listed in the memory information display. After installing additional memory, you will check this memory information display again to verify that the system recognizes the newly installed memory

Example Memory Information Display

```
Main Menu: Enter command > in me

MEMORY INFORMATION

   MEMORY STATUS TABLE

   Slot     Size(a+b)     Status
   ----     --------      ------
   0a/b      128MB       Configured
   1a/b       32MB       Configured
   2a/b       32MB       Configured
            --------
   TOTAL      192MB
```

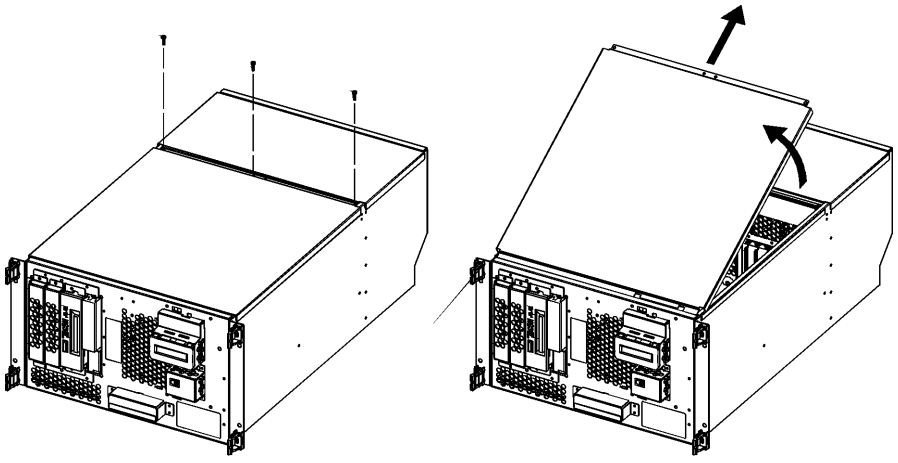
B. Turn Off Power to the System

1. Set the Power switch on the server front panel to the OFF position.
2. Disconnect the AC power cord from the system cabinet.



C. Remove the Top Cover

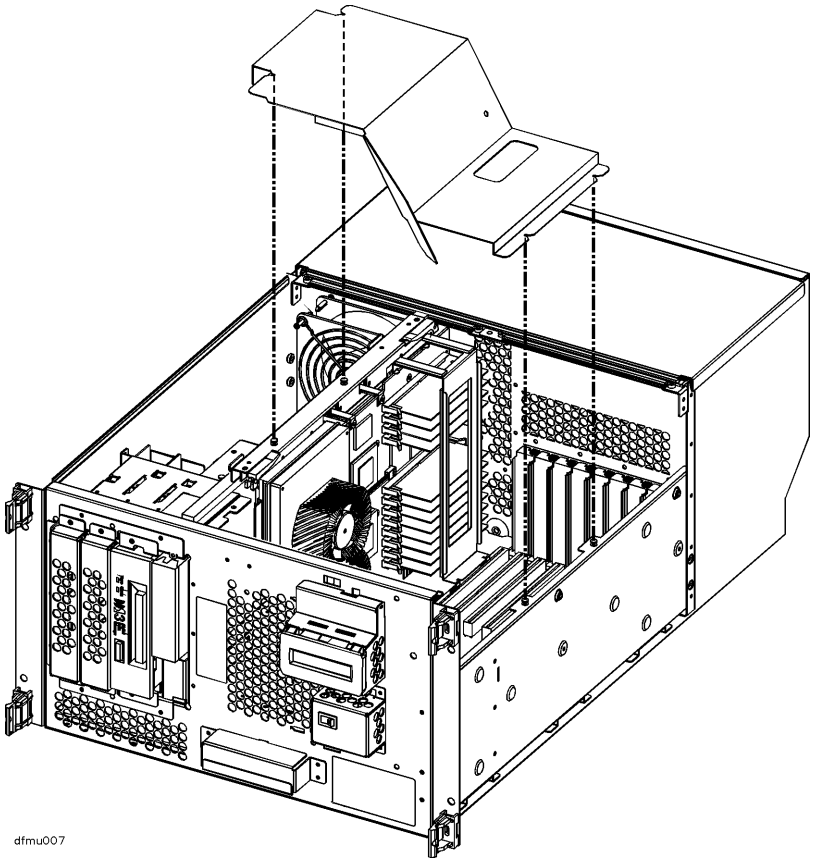
1. Remove the three screws holding the top sheet metal cover in place.
2. Grasp the sides of the top front panel and lift it up and toward the rear.
3. Pull the top rear panel toward the front of the server, then lift it up and out.



dfmu006

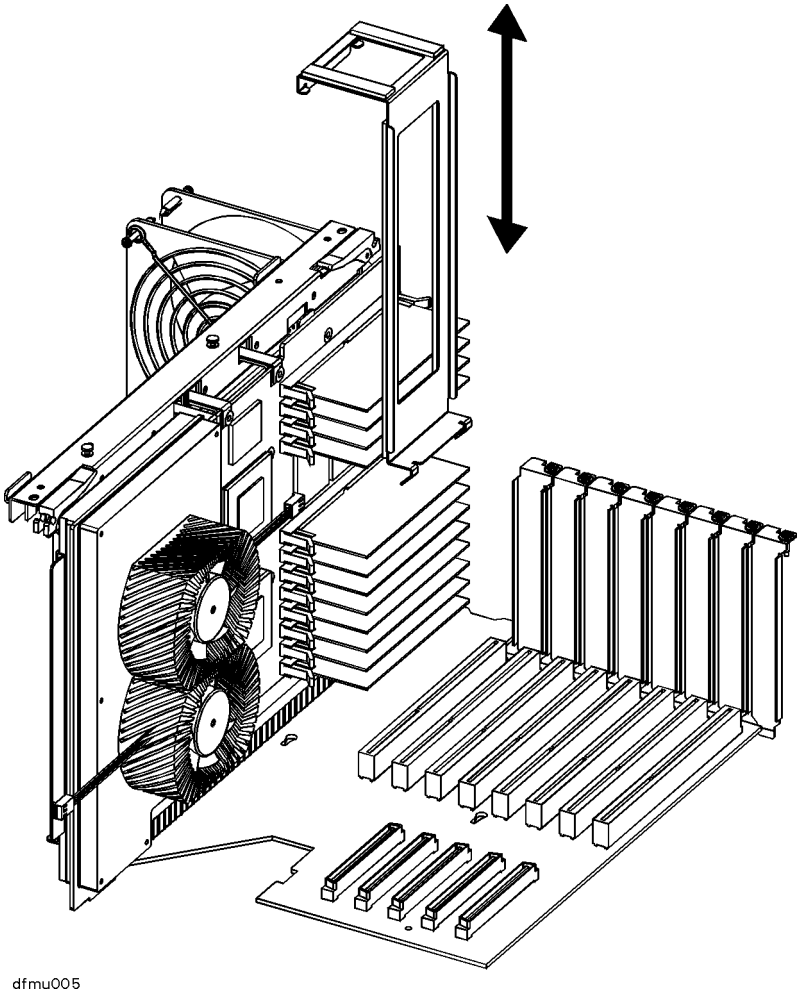
D. Remove the EMI Cover

1. Loosen the two notches at the top of the EMI cover from the tabs on the Processor/Memory card by pulling back and slightly flexing the EMI cover until the notches come loose.
2. Pull the EMI cover up slightly until the two notches at the bottom of the cover come loose from the tabs at the side server chassis.



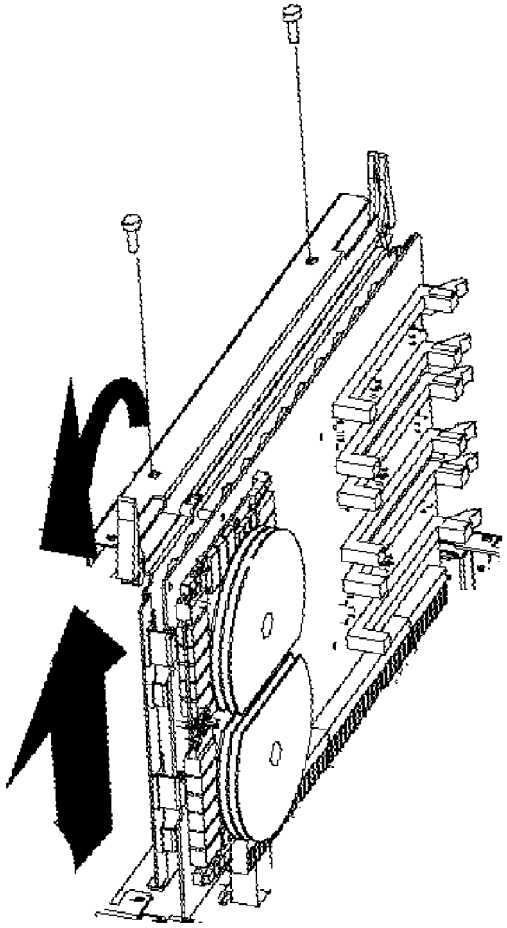
E. Remove the Memory Simm Retainer

Lift the memory SIMM retainer directly up and out of the system.



F. Remove the Processor/ Memory Card

1. Attach an anti-static strap to your wrist, and ground it to the main chassis.
2. Disconnect the cables label P13 and P14 from the back of the Processor/Memory card.
3. Loosen and remove the two (2) screws that secure the Processor/Memory card to the chassis.
4. Pull out the two plastic levers on the Processor/Memory card.
5. Pull the Processor/Memory card out of the system cabinet, and set it down on an anti-static mat.



G. Plan the Memory Configuration

Before you begin, you should understand the following definitions:

A *SIMM* (Single In-line Memory Module) is a single memory Printed Circuit Assembly (PCA) or memory board. SIMMs have memory on one side of the PCA only. All SIMMs have their size marked on the board near the upper left corner.

A *DIMM* (Dual In-line Memory Module) is a single memory PCA with memory on both sides of the PCA. All DIMMs have their size marked on the board near the upper left corner, also.

A *module* is a pair of SIMMs or DIMMs. Memory for your system is purchased and installed only in modules; **never install just one SIMM**.

NOTE

The acronym SIMM is used throughout this document to indicate either SIMM or DIMM.

Plan your memory configuration so that it conforms to the rules listed below.

Memory is installed in the following increments:

- 32MB memory module (two 16MB SIMMs)
- 64MB memory module (two 32MB SIMMs)
- 128MB memory module (two 64MB SIMMs)
- 256MB memory module (two 128MB SIMMs)
- 512MB memory module (two 256MB SIMMs).

Memory Rules

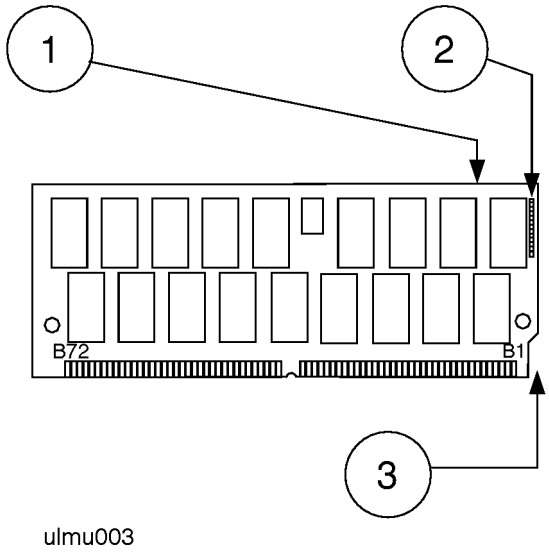
1. Memory must always be added as *pairs* of SIMMs or DIMMs of the same size. For example: two 16MB, two 32MB, two 64MB, two 128MB or two 256MB.
2. The largest memory SIMM pair must be installed in the lowest numbered slots, followed by the next largest memory pair in the next lowest pair of slots, until all SIMM modules are installed.
3. SIMM modules must be installed in the correct slot sequence. The first SIMM pair is installed in slots 0A and 0B. The next SIMM pair would go into slots 1A and 1B, and so on until all SIMM modules are installed. Follow rule number 2.

   If the memory upgrade increments are larger than the existing (currently installed) memory increments, ALL memory must be removed, re-ordered, and re-installed following the rules listed in this section.

Memory Size and Orientation

1. Each memory SIMM (board) has its size marked on one side of the board near an upper corner: 16MB, 32MB, 64MB, 128MB, or 256MB. (In the figure shown, the marking is on the reverse side of the board.)
2. The white stripe on the end of the memory SIMM identifies the end of the board that must be toward the white ejector lever of the connector on the Processor/ Memory card.
3. The notch at the lower corner of the board also indicates the end of the board that must go toward the white ejector lever.

Memory SIMM Card Size and Orientation Markings



After you have planned your memory configuration according to the memory size, orientation, and pairing rules, proceed to step **H. Install Memory modules**.

After you have planned your memory configuration according to the memory size, orientation, and pairing rules, proceed to step **H. Install Memory modules**.

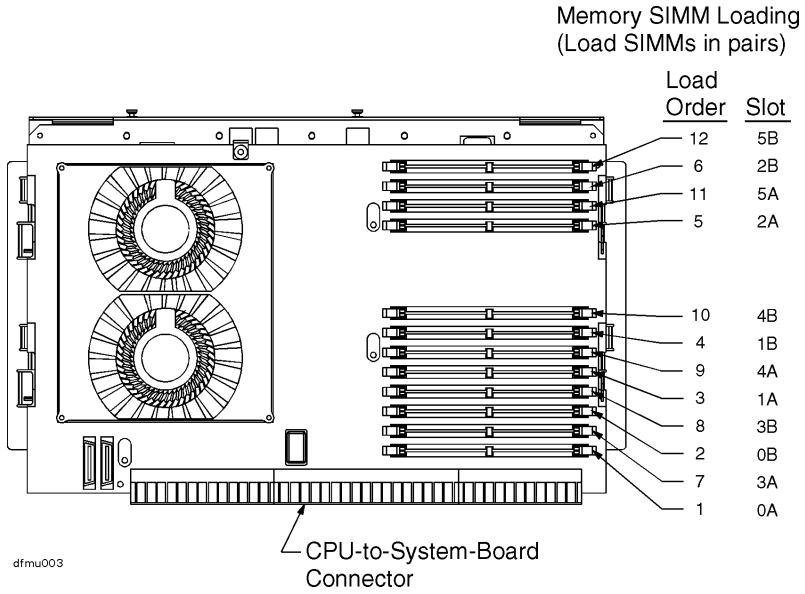
Be sure to follow the memory size, orientation, and pairing rules listed on page 2-11.

After you have planned your memory configuration according to the memory size, orientation, and pairing rules, proceed to step **H. Install Memory modules**.

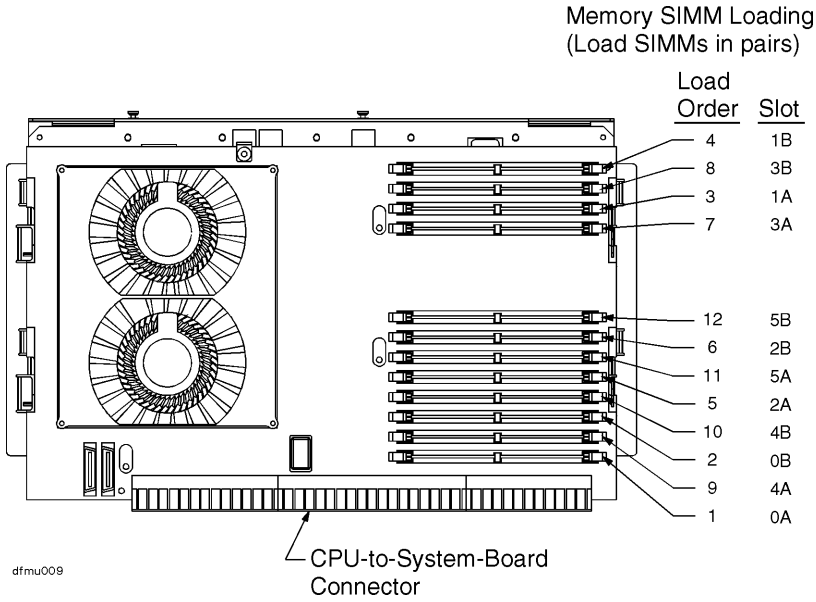
Memory Load Order

Pairs of DIMMs or SIMMs, of like size, must be loaded in the proper load order. The first and largest capacity modules starting in slots 0A and 0B, then slots 1A and 1B, and so on, ending with slots 5A and 5B (see **Load Order** in the figure following). Follow the memory size, orientation, and pairing rules listed on page 2-11.

Memory Module Load Order — R380



Memory Module Load Order — R390

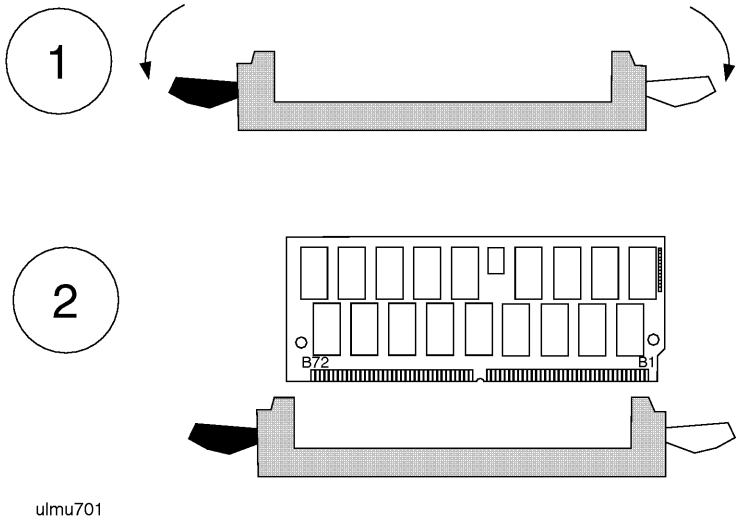


H. Install Memory modules

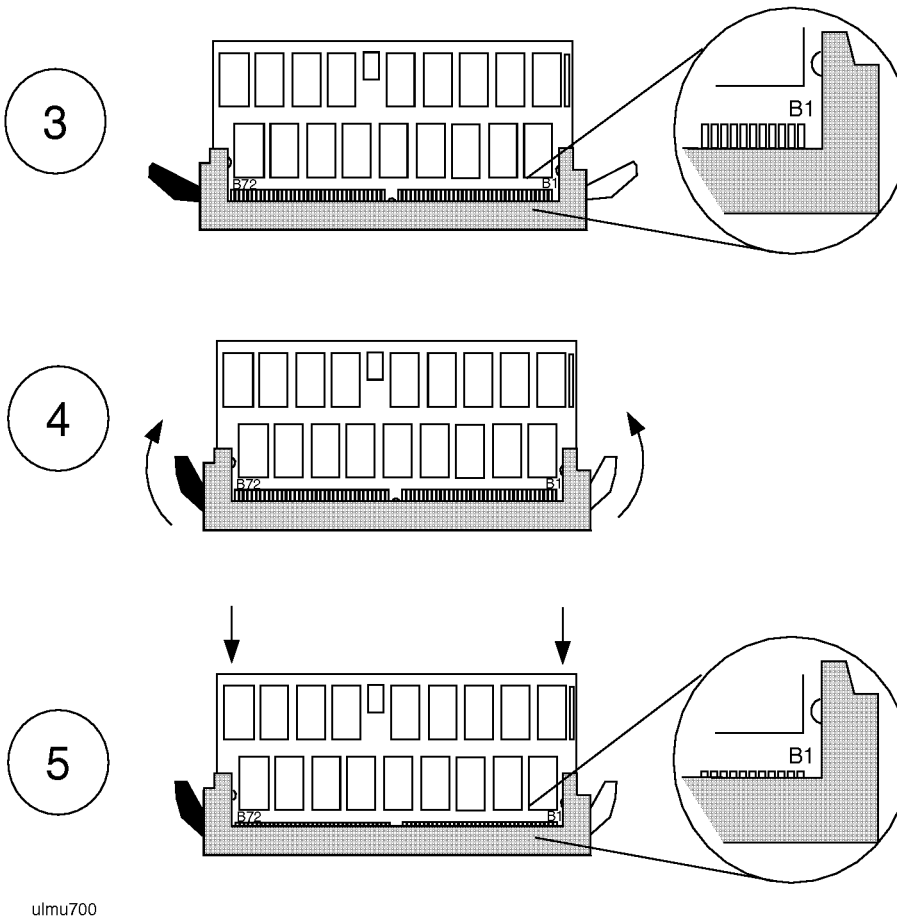
CAUTION

Be sure that an anti-static wrist strap is still attached to your wrist and grounded to the cabinet main chassis when you handle and install the memory modules.

1. Open the ejector levers (down position).
2. Orient the memory SIMM (card) correctly, with the white stripe on the card toward the white ejector lever.
3. Insert the memory SIMM into the connector until the fingers on the card edge just touch the connector.
4. Close the ejector levers (up position).
5. Push the memory SIMM firmly and evenly into the connector until it clicks into place.



ulmu701


3
B1
B72
B1
4
B72
B1
5
B1
B72
B1
ulmu700

I. Replace the Processor/ Memory Card

1. Verify that an anti-static strap is still strapped to your wrist, and grounded to the cabinet main chassis.
2. Place the Processor/Memory card into the system cabinet so that the card rests in the metal rails with the large connector facing into the cabinet (see the figure on page 2-9).
3. Pull the extractor levers on the Processor/Memory card out away from the card.
4. Slide the Processor/Memory card into the system cabinet until the large connector is properly seated in the corresponding system board connector.
5. Push in the two extractor levers on the Processor/Memory card.
6. Insert and tighten two screws to secure the Processor/Memory card in the cabinet.
7. Reattach power cables P13 and P14.

J. Replace the Memory SIMM Retainer

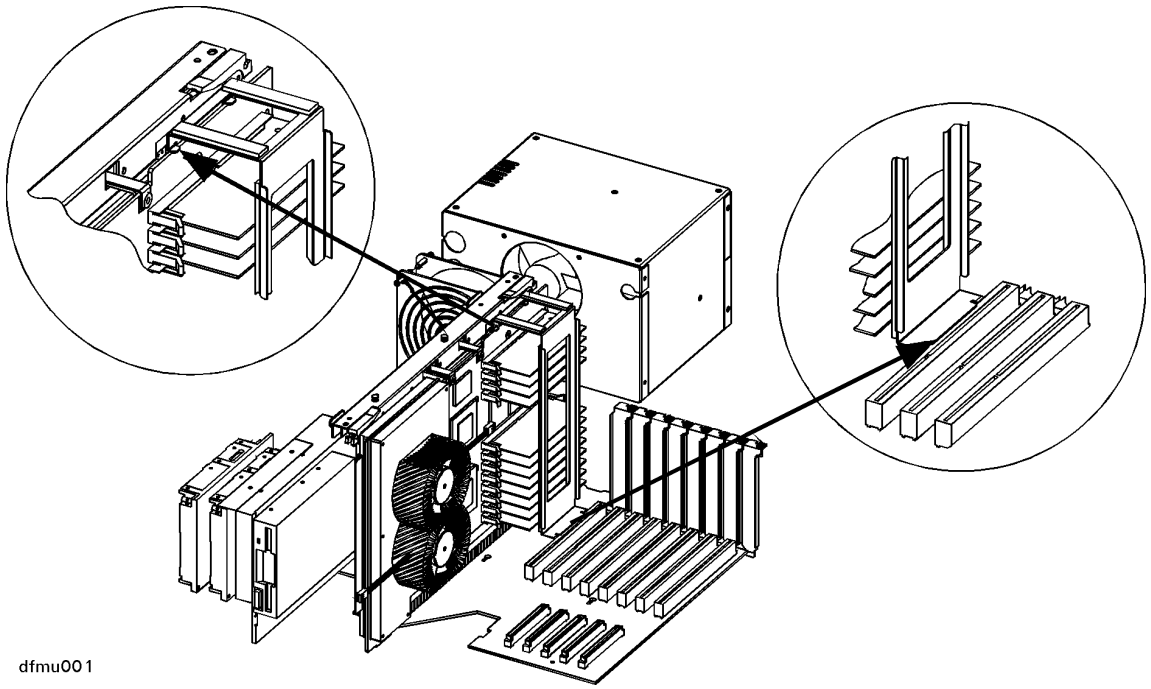
Refer to the figure on this page while performing these steps.

1. Position the memory SIMM retainer between the memory SIMMs and the HSC card slot, centered over the memory SIMMs.
2. Lower the retainer until its bottom flange rests on the plastic HSC card connector just above the system board in the bottom of the chassis.

CAUTION

Avoid contact between the metal tabs at the foot of the retainer and the circuitry on the system board beneath. Otherwise, damage to the system board may occur.

3. Pull the top of the retainer toward the memory SIMMS until the top rear flange hooks behind the processor/memory board, and the small tabs next to the flange rest on the top edge of the processor/memory board.

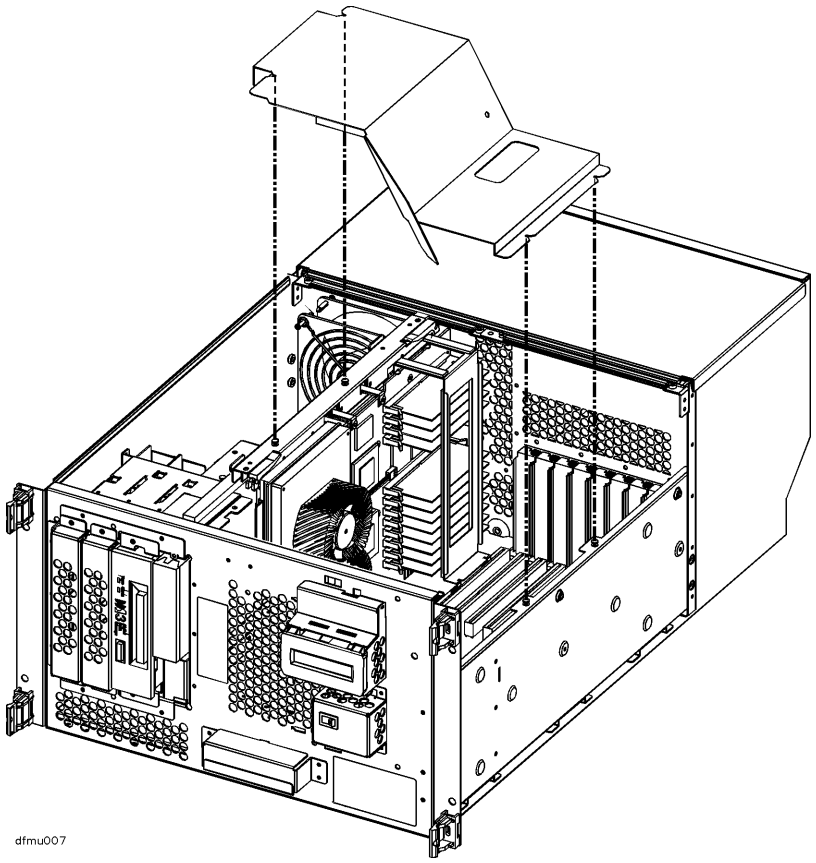


dfmu001

K. Replace the EMI Cover

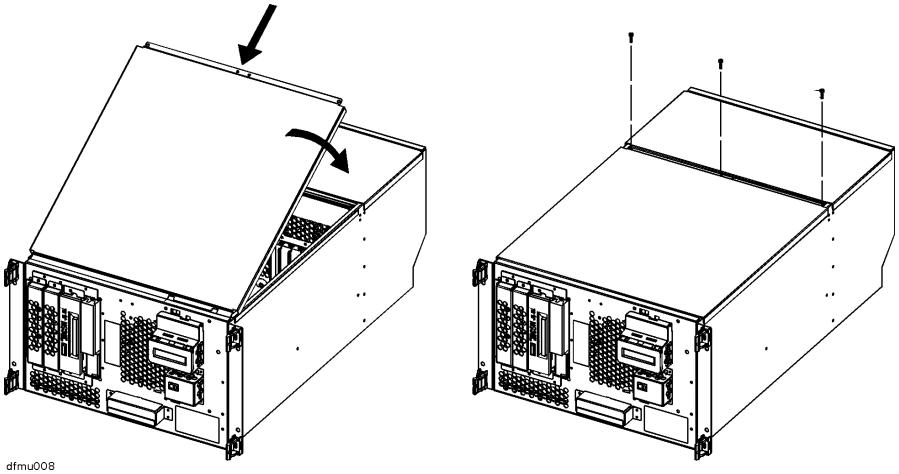
Place the EMI cover as shown in the illustration below.

1. Insert the two lower notches of the EMI cover onto the tabs at the side of the server cabinet.
2. Flex the EMI cover slightly to insert the two notches at the top of the EMI cover onto the tabs on the processor/memory card.



L. Replace the Top Sheet Metal Panels

1. Position the hinge tab of the top rear panel so that it goes into the slot at the rear of the system cabinet. Lower the top rear panel into place.
2. Position the hinge tab of the top front panel so that it goes into the slot at the front of the system cabinet. Lower the top front panel into place.
3. Align and tighten the three screws of the top front panel into the holes as shown in the illustration.



This completes the system memory upgrade installation procedure. Proceed to the **Memory Upgrade Verification** procedure starting on the next page.

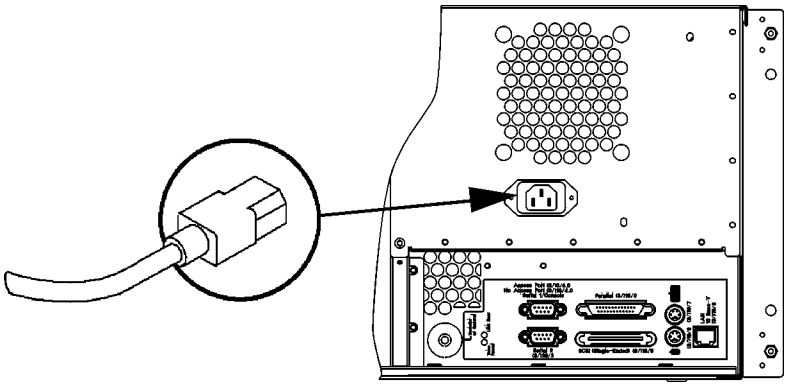
Memory Upgrade Verification

Overview

The following list is a summary of the verification process. Refer to the **Memory Upgrade Verification Procedure** below for detailed instructions.

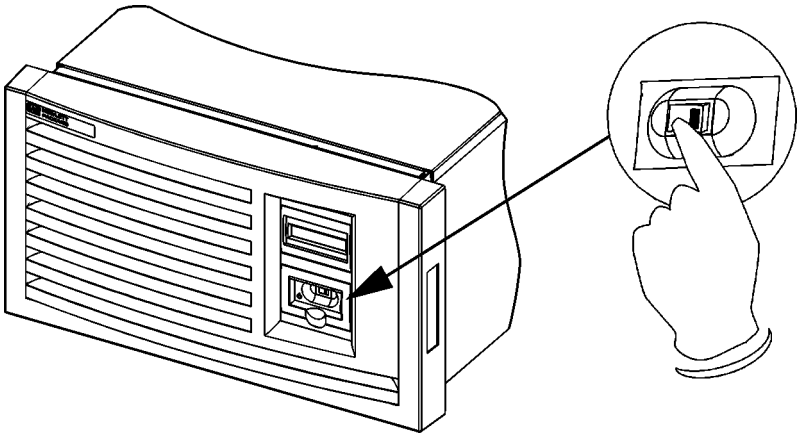
A. Connect power cord.

Connect the power cored to the system cabinet.



B. Turn on power to the system.

Set the front panel power switch on the system cabinet to the ON position.



C. Check for Selftest Error Messages

1. Observe console display for selftest error messages.
2. If warning messages appear, write them down and refer to the section titled **Troubleshooting Configuration Error Symptoms** at the end of this manual for troubleshooting information.

D. Halt the Boot Process

If Autoboot is set to ON, you will have to interrupt the boot process to get to the Boot Console Handler, where you will have access to the commands for verifying the memory installation.When prompted by the following message, halt the boot process by pressing any key on the keyboard

```
Processor is booting from first available device.

To discontinue, press any key within 10 seconds.

Boot terminated.

-- Main Menu ------------------------------------------------

Command                     Description
-----------                 --------------------
BOot [PRI|ALT|<path>]           Boot from specified path
PAth [PRI|ALT|CON|KEY] [<path>] Display or modify a path
SEArch [DIsplay|IPL] [<path>]   Search for boot devices
TOC                             Soft boot the system

COnfiguration [<command>]   Access Configuration menu/commands
INformation [<command>]     Access Information menu/commands
SERvice [<command>]         Access Service menu/commands

DIsplay                     Redisplay the current menu
HElp [<menu>|<command>]     Display help for menu or command
RESET                       Restart the system
-------
Main Menu: Enter command >
```

E. Verify Memory Installation

If successful, the following steps complete the memory installation verification. If the memory verification is not successful, refer to the section titled **Troubleshooting Memory Configuration Error Symptoms** at the end of this manual.

1. At the Main menu, type “in me” to get to display memory information.
2. Confirm that the amount of memory listed in the memory information display is equal to the amount of memory you have installed in the system.

Example Display

```
Main Menu: Enter command > in me

MEMORY INFORMATION

   MEMORY STATUS TABLE

   Slot     Size(a+b)     Status
   ----     ---------     ------
   0a/b       256MB      Configured
   1a/b       128MB      Configured
   2a/b        64MB      Configured
            ---------
   TOTAL      448MB


   DETAILED MEMORY CONFIGURATION TABLE

   SPA          GROUP  SMC  SMC Status   Bank  Bank Status  Size Slot
   ---          -----  ---  ----------   ----  -----------  ---  ----
   0x00000000     0     0   Configured     1   Configured   64MB  1a/b
                        0   Configured     3   Configured   32MB  2a/b
                        1   Configured     0   Configured   32MB  2a/b
                        1   Configured     2   Configured   64MB  1a/b

   0x04000000     1     2   Configured     1   Configured  128MB  0a/b
                        2   Configured     2   Configured  128MB  0a/b

   Group 0 interleaved  4 ways over  4 banks

   Group 1 interleaved  2 ways over  2 banks


   BAD MEMORY TABLE

   SMC  SMC Status   Bank  Bank Status   SIMM Size  Slot
   ---  ----------   ----  -----------   ---------  ----
    0   Present        0   Not Present      0MB     4a/b
                       2   Not Present      0MB     5a/b
    1   Present        1   Not Present      0MB     5a/b
                       3   Not Present      0MB     4a/b
    2   Present        0   Not Present      0MB     3a/b
                       3   Not Present      OMB     3a/b
```

Troubleshooting Memory Configuration Error Symptoms

Incorrectly installed memory modules or configuration violations may result in the following symptoms when trying to verify the memory installation after power-on:

- Log warning and display hex code
- Boot command is disabled
- Console warning messages.

Possible Causes

- Memory modules not seated properly
- Memory modules not installed in the proper sequence
- Memory modules not paired
- Incorrect value matching of memory modules.

Most memory configuration errors will not cause selftest to halt the system. However, warning codes and messages may be displayed on the front panel Liquid Crystal Display (LCD) and on the system console.

One or more of the following warning messages may appear on the system console.

Table 1 Console Display Messages Concerning Memory

FAULT:	**FLT 7402**; **`Both EDO and STD memory SIMMs installed`**. This message indicates an incorrect PDC code revision level. Your PDC needs to be updated. Call your response center for more information.
WARNING:	Memory has been initialized, but not tested as a result of FASTBOOT being enabled. To test memory, use the FASTBOOT command in the CONFIGURATION menu and reboot the system
WARNING:	Selftests have been disabled. System integrity is at risk. Use SELftest ON to enable selftest.
WARNING:	Memory SIMMs are not installed in the proper sequence. The BOOT command has been disabled to prevent thermal damage. refer to the memory configuration label for the proper sequence.

WARNING:	Memory configuration is not optimized for performance. Refer to the System Installation or Memory Installation manuals for memory configuration guidelines.
WARNING:	Memory has been reconfigured due to a physical change or because the Page Deallocation Table (PDT) was cleared. This is for information only. No action is required.
WARNING:	Memory banks deallocated due to a SIMM size mismatch or a SIMM failure. Refer to the “ME” command in the INFORMATION menu for error information.

To get more information about memory modules that may have been deconfigured because they were installed incorrectly, type “in me” at the Boot Console Handler. If the problem persists after checking the memory installation, contact an HP Service Representative.

PDC Code Revision You can verify the PDC revision using the Boot Console Handler (BCH). Perform the following steps to use the BCH for PDC revision checking:

1. Log on as root, and enter `reboot -r`. This command will shutdown the Operating System and reboot the system.
2. If autoboot is on, you will receive the following message:

   ```
   “Process is starting autoboot process

   To discontinue, press any key within 10 seconds”
   ```

   At this point, press any key within 10 seconds to interrupt the boot process.
3. The Main Menu is displayed. At the Main Menu prompt, enter **in** .
4. The Information Menu is displayed. At the Information Menu prompt, enter **fv** .

The system will respond with the current firmware revision.

Obtaining the Correct Firmware Patch

The firmware patches for all HP 9000 Enterprise Server systems can obtained from either the HPESC (HP Electronic Support Center) via the World Wide Web, or via FTP.

Downloading the Firmware Patch via the World Wide Web

To access and download the appropriate patch, perform the following steps:

1. Connect to the HPESC World Wide Web service home page at their URL by entering the following:

   http://us-support.external.hp.com

2. Under Support Line, select the Patch Database option.
3. If you are a previously registered user:

   a. Click on “Enter as a Registered User” and select your region.

   b. Login, entering your User ID and password. This will take you to the Patch Database Main screen.

   If you are a first-time user:

   a. Click on your geographic region under “Register Now”.

   b. Review the “Terms and Conditions” page. At the bottom of the page you may accept the terms and conditions and proceed to the registration page.

   c. Complete the registration information requested.

   d. Once the registration information has been successfully transmitted, the User ID Assigned screen will appear. Write down the User ID (or print the screen) for later reference.

   e. Click on “Begin Using Patch Database Now” to proceed to the Patch Database Main screen.

4. Select the Firmware Patches option.
5. Select the CPU Patches option and click on “Show Patches”.
6. Choose the appropriate patch (for example: PF_CULL3612). A patch description will appear. Click on “download” to copy the patch to your system.

NOTE The selected patch must be downloaded from HP SupportLine onto a system that has HP-UX as the operating system.

7. Follow the instructions in the Readme file to create a bootable tape and to update PDC.

Downloading the Firmware Patch using FTP.

1. Connect to HPESC via ftp. You must initiate downloading from an open subnet system as:

   `>ftp us-support.external.hp.com`

   (If you do not have an open subnet system, try using rftp instead of ftp.)

2. Login as “anonymous”.
3. At the Password prompt, enter your e-mail address as the password.
4. Change to the directory containing the firmware patches:

   `> cd firmware_patches/hp/cpu`

   If desired, review the contents of the directory by using the **`ls`** command. For each patch, there is an accompanying text file (patchfilename.txt). The text file contains the patch description and the instructions for creating the patch tape.

5. Download the appropriate patch file and text file:

   `get <patchfilename>`

   `get <patchfilename>.txt`

6. Follow the instructions in the Readme file to create a bootable tape and to update PDC.