System Upgrade Installation Guide

HP 3000 CS 99x Family, HP 9000 T-Class Systems

HP 3000 Corporate Business Systems and HP 9000 Business Servers

Upgrading 991/995/T500 to 996/T520

Adding Processors to 996/T520

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Safety Considerations

This product and related documentation must be reviewed for familiarization with safety markings and instructions before operation. The following figure shows some of the safety symbols used on the product to indicate various sfety considerations.

Safety Symbols

Instruction manual symbol: the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual in order to protect the product against damage.

Indicates hazardous voltages.

Indicates wiring terminal intended for connection of the protective earthing conductor associated with the supply wiring.

Indicates chassis earth (ground) terminal (used to indicate common connected to grounded chasis and for ESD prevention).

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WARNING	**The WARNING sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not done correctly or adhered to, could result in injury. Do not proceed beyond a WARNING sign until the indicated conditions are fully understood and met.**

CAUTION	The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, or the like, which, if not done correctly or adhered to, could damage or destroy part or all of the product. Do not proceed beyond a CAUTION sign until the indicated conditions are fully understood and met.

Preface

This edition of the System Upgrade Installation Guide contains technical information about processor and memory cards for HP 3000 Corporate Business Systems and HP 9000 Corporate Enterprise Servers, and is intended for experienced Hewlett-Packard customer service personnel.

At the time of publication, HP 3000 Corporate Business Systems and HP 9000 Corporate Enterprise Servers included the following models:

HP 3000 99x Family

990/992		991/995		996[1]	997
990CX	990DX	991CX	991DX	996/80	997/100
992/100CX	992/100DX	995/100CX	995/100DX	996/100	997/200
992/200CX	992/200DX	995/200CX	995/200DX	996/200	997/300
992/300CX	992/300DX	995/300CX	995/300DX	996/300	997/400
992/400CX	992/400DX	995/400CX	995/400DX	996/400	997/500
		995/500CX	995/500DX	996/500	
		995/600CX	995/600DX	996/600	
		995/700CX	995/700DX	996/700	
		995/800CX	995/800DX	996/800	

1. A 996 System may be field upgraded to 9, 10, 11, or 12 processors. Factory integrated servers are sold with a maximum of 8 processors.

HP 9000 T-Class Systems

890	T500	T520	T600

1 Overview

This guide describes two types of upgrades:

- **Chapter 2 (System Upgrades)** covers complete upgrades from a 991/995/T500 to a T996/T520.
- **Chapter 3 (Adding More Processors)** covers adding processors and memory to existing 996/T520 systems.

NOTE Unless otherwise noted, the installation procedures in this manual apply to all upgrades listed above. Exceptions are noted by reference to specific system or model numbers.

WARNING **Installation should be performed only by qualified service personnel. High voltages are present and constitute a risk of electric shock hazard.**

NOTE Be sure to review all Service Notes which may pertain to the system product and its associated PCAs before performing any installation procedures in this guide.

Terminology

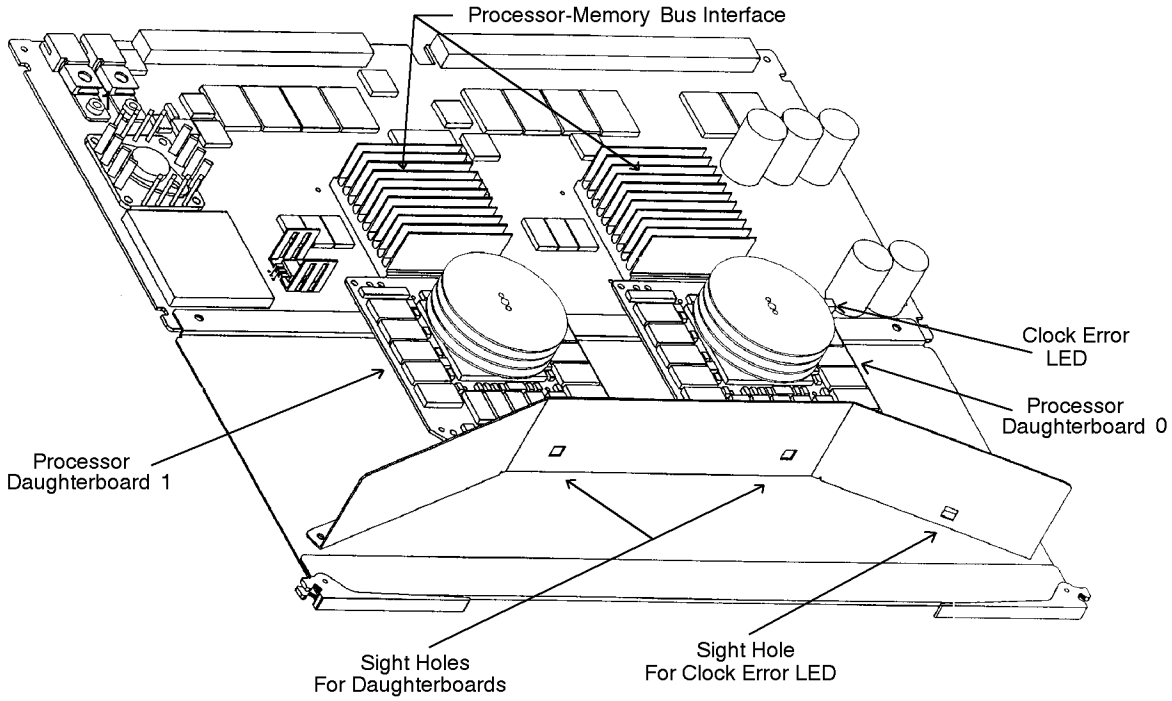
The following terms are used in this document to refer to systems and components:

Term	Refers to:
990	Pre-upgrade HP 3000 systems (CS 990/992)
996	Upgraded (CS 996) systems
99x	All HP 3000 CS 990, 991, 992, 995, 996 systems
T500	Pre-upgrade HP 9000 servers (CS T500)
T520	Upgraded HP 9000 servers (CS T520)
T-Class Systems	All HP 9000 T5x0 servers

Processor Card

All upgrades require installing 996/T520 processor cards or processor daughterboards (modules) to the system. See Figure 1-1.

Figure 1-1 996/T520 Processor Card

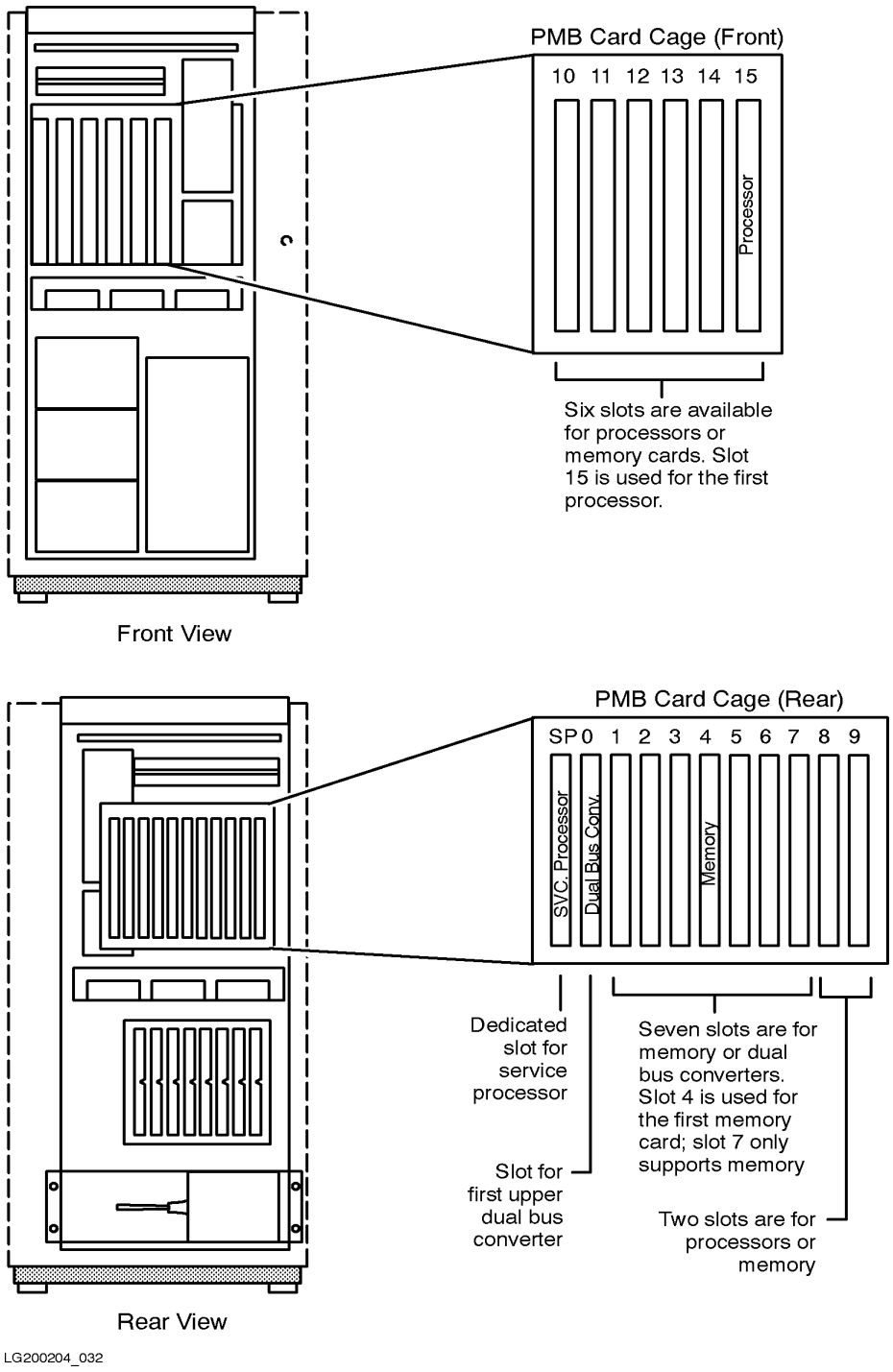


Each processor card for the 996/T520 contains one or two processor daughterboards (modules).

Card Location

Processor cards and memory cards are installed in the Processor-Memory Bus (PMB) card cage. See Figure 1-2.

Figure 1-2 Card Locations in the Processor-Memory Bus (PMB) Card Cage



2 System Upgrades

This chapter covers complete system upgrades:

- HP 9000 CS T500 to CS T520
- HP 3000 CS 991/995 to CS 996

Chapter 3 (Adding More Processors) covers adding processors and memory to existing 996/T520 systems.

Chapter Contents

The chapter is organized as follows:

- Upgrade Kits.
- Upgrade Overview.
- Upgrade Procedure.
  - Verifying the Contents of the Kit
  - Updating the Operating System
  - Loading FUT Firmware
  - Installing New Hardware
  - Installing New SPU Firmware
  - Initializing Internal Values with SS_CONFIG
  - Adding Upgrade Labels
  - (Optional) Installing the PowerTrust Unit

Upgrade Kits

Table 2-1 CS T500 to CS T520 Field Upgrade Option

Product Number	Option	Description
SSP# A3314A		Corporate Business Server Model T520 Base Configuration, single processor system
A3310A		Corporate Business Server Model T520 Base Configuration, single processor system
A3346A		Additional 120 Mhz PA-RISC processor for Model T520
A3348A	Opt. 101	Upgrade from 1-CPU Model 500 to 1-CPU Model T520 Uniprocessor system
	Opt. 102	Upgrade from 2-CPU Model 500 to 2-CPU Model T520 SMP system
	Opt. 103	Upgrade from 3-CPU Model 500 to 3-CPU Model T520 SMP system
	Opt. 104	Upgrade from 4-CPU Model 500 to 4-CPU Model T520 SMP system
	Opt. 105	Upgrade from 5-CPU Model 500 to 5-CPU Model T520
	Opt. 106	Upgrade from 6-CPU Model 500 to 6-CPU Model T520 SMP system
	Opt. 107	Upgrade from 7-CPU Model 500 to 7-CPU Model T520 SMP system
	Opt. 108	Upgrade from 8-CPU Model 500 to 8-CPU Model T520 SMP system
	Opt. 109	Upgrade from 9-CPU Model 500 to 9-CPU Model T520
	Opt. 110	Upgrade from 10-CPU Model 500 to 10-CPU Model T520 SMP system
	Opt. 111	Upgrade from 11-CPU Model 500 to 11-CPU Model T520 SMP system
	Opt. 112	Upgrade from 12-CPU Model 500 to 12-CPU Model T520 SMP system
A2998A	Opt. 001	3.0 KVA Rackmounted HP PowerTrust Uninterruptible Power System (UPS)
	Opt. 118	200-240V U.S. power, with cord and connector
	Opt. 117	200-240V European power, no cord
A2233A		Add 128-MB ECC memory board
A2234A		Add 256-MB ECC memory board
A2588A		Add 512-MB ECC memory board
A2589A		Add 768-MB ECC memory board

Table 2-2 CS 991/995 to CS 996 Field Upgrades

Product Number	Option	Description
SSP# A3394A		Corporate Business System 996 Model Upgrade from 991 and 995
A3386A		Upgrade from 1-CPU 991 to 1-CPU 996/80
A3433A		Upgrade from 1-CPU 995/100 to 1-CPU 996/100 SMP system
A3434A		Upgrade from 2-CPU 995/200 to 2-CPU 996/200 SMP system
A3435A		Upgrade from 3-CPU 995/300 to 3-CPU 996/300 SMP system
A3436A		Upgrade from 4-CPU 995/400 to 4-CPU 996/400 SMP system
A3437A		Upgrade from 5-CPU 995/500 to 5-CPU 996/500 SMP system
A3438A		Upgrade from 6-CPU 995/600 to 6-CPU 996/600 SMP system
A3429A		Upgrade from 7-CPU 995/700 to 7-CPU 996/700 SMP system
A3440A		Upgrade from 8-CPU 995/800 to 8-CPU 996/800 SMP system
A2998A	Opt. 003	Power Protection. One 3.0 KVA HP PowerTrust Uninterruptible Power System (UPS) is required for powerfail protection for the SPU and the first peripheral expansion cabinet unless a customer-provided power protection solution is used.
	Opt. 018	200-240V U.S. power, with cord and connector
	Opt. 117	200-240V European power, no cord
A2998A	Opt. 001	3.0 KVA HP PowerTrust UPS. (Additional 3.0 KVA PowerTrust UPSs may be required to ensure SPU powerfail protection for configurations with external HP-PB I/O cardcages not racked in the first peripheral expansion package.)
A3085A	Opt. 001	HP PowerTrust-compatible Power Distribution strip for existing 1.6m peripheral expansion rack. 200-240V Universal power cord and IEC 320-C20 connector for HP PowerTrust UPS in the same cabinet.
A2233A		Add 128-MB ECC memory board
A2234A		Add 256-MB ECC memory board
A2588A		Add 512-MB ECC memory board
A2589A		Add 768-MB ECC memory board

Upgrade Overview

The following points summarize the main steps involved in performing a system upgrade. Figure 2-1 shows a flowchart of the process.

1. Make sure the operating system has been updated to the required version:

Model	Version
CS T520	HP-UX 10.01 or higher
CS 996	MPE/iX Release 5.0 (VUF C.50.03 or higher)
Note: For support of 9, 10, 11, or 12-way multiprocessing on the 996 server, MPE /iX Release 5.0 requires the following patches: HXY4 and ODIJX25.	

2. Determine whether FUT (Firmware Update Tool) is on the system by executing the FV command at the SP> prompt. For more information about the FUT, refer to the *Firmware Update Guide*.
   a. If the FUT is on the system, shut down the OS and switch to FUT using the SW command at the SP> prompt.
   b. If FUT is NOT on the system, load it using the procedure described later in this manual (see <Undefined Cross-Reference>).
3. Install new hardware in the SPU:
   a. Shut down the system by turning the Standby/Ready switch to the Standby position and turning the rear circuit breaker switch to OFF.
   b. Gain access to the PMB (Processor Memory Bus) card cage.
   c. Remove existing processor cards and install one or more processor cards in the appropriate PMB slots.
   d. Add upgrade memory cards in the appropriate PMB slots if the upgrade includes more memory.
   e. Power up the system by turning the Standby/Ready switch to the Ready position and turning the rear circuit breaker switch to ON.
   f. Verify the installation of processor and memory cards:
      - Verify that the control panel reports the new number of processors.
      - Verify the proper configuration of processors by executing the HC command at the SP> prompt. Only two modules/card should be reported as present.
4. Perform a 996/T520 firmware update (using the FUT).
5. Perform additional verifications:

a. Verify that the initial PDC display reports the new number of processors and amount of memory.

b. (Recommended) Run the EDPROC offline diagnostic from the Support Tape (on MPE/iX systems, the EDPROC diagnostic is available from the boot disk). If you installed new memory cards, run MEMTEST at the PDC interface.

6. Use the SS_CONFIG utility to set the appropriate values for the system parameters.
7. Add upgrade labels to the SPU.
8. (Optional) Install the PowerTrust unit. The PowerTrust unit is an Uninterruptible Power System (UPS).

Figure 2-1 996/T520 Upgrade Flowchart

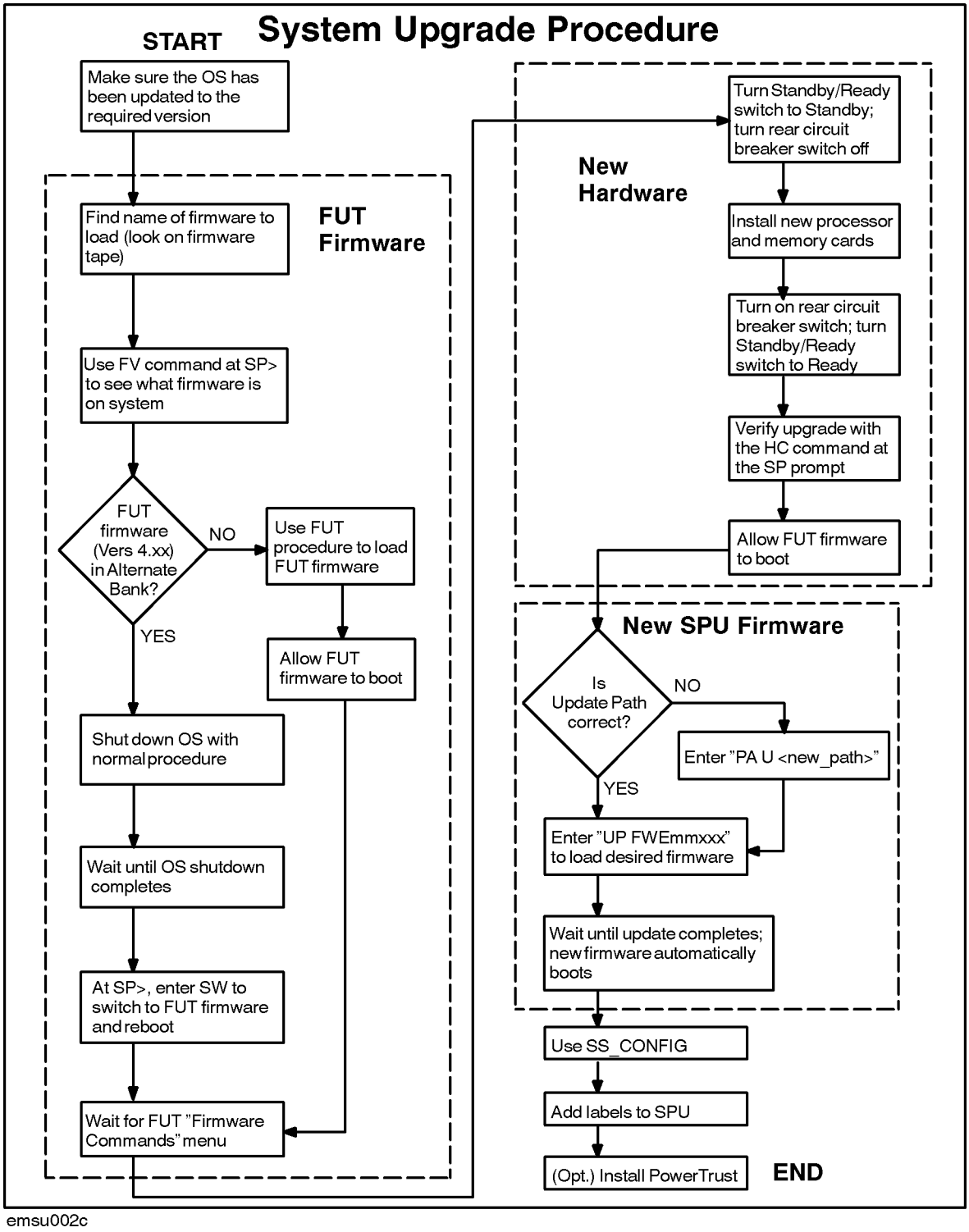


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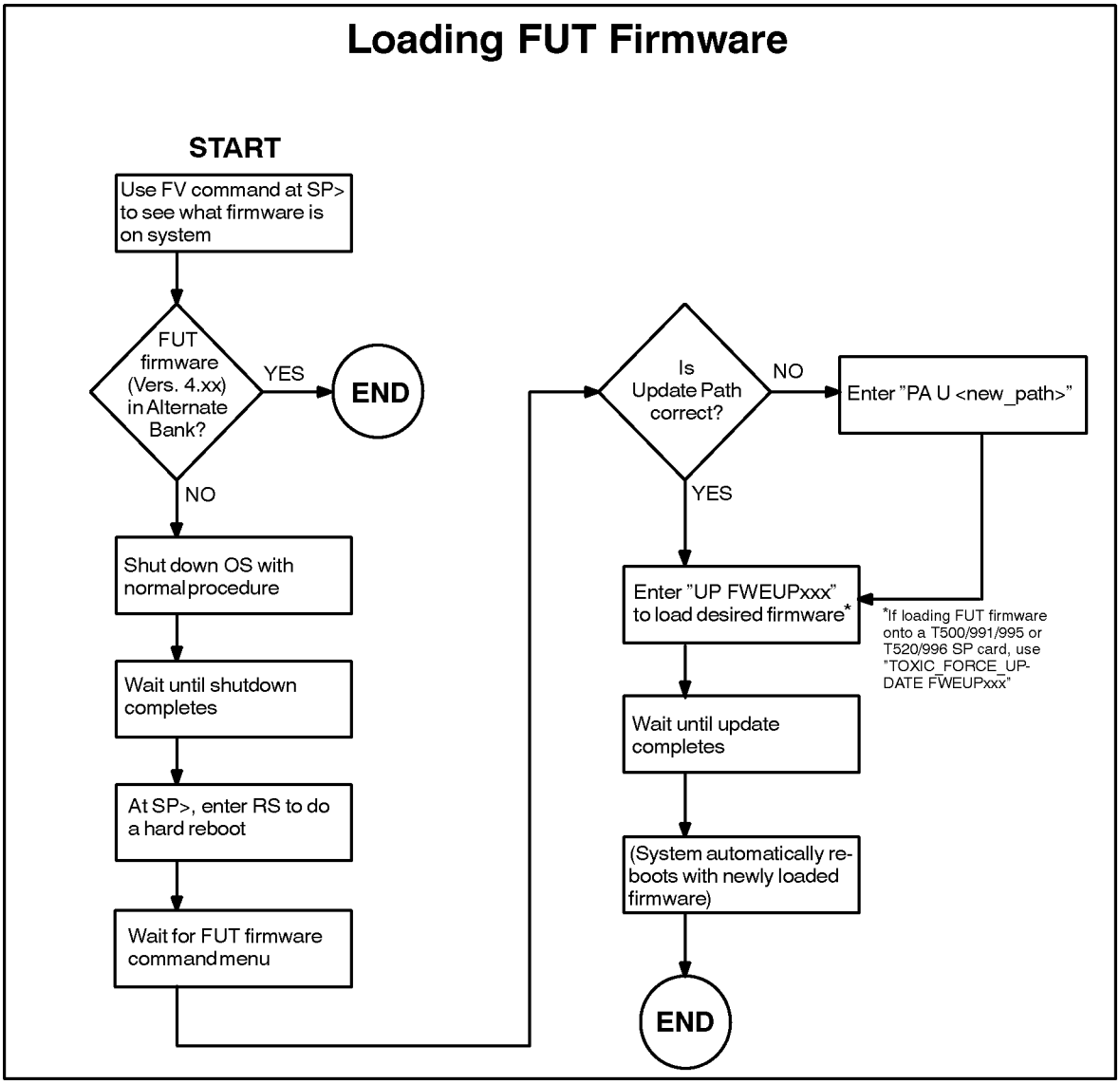
Figure 2-2 Steps for Loading FUT Firmware Onto the SP Card



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Upgrade Procedure

The remainder of this chapter describes how to install the 996/T520 upgrade.

Verifying the Contents of the Kit

Verify that the upgrade kit contains:

- Processor cards:
  - 1-CPU upgrade: 1 processor card with 1 processor daughterboard (module).
  - 2-CPU upgrade: 1 processor card with 2 processor daughterboards (modules).
  - 3-CPU upgrade: 2 processor cards with 3 processor daughterboards (modules).
  - 4-CPU upgrade: 2 processor cards with 4 processor daughterboards (modules).
  - 5-CPU upgrade: 3 processor cards with 5 processor daughterboard (module).
  - 6-CPU upgrade: 3 processor cards with 6 processor daughterboard (module).
  - 7-CPU upgrade: 4 processor cards with 7 processor daughterboards (modules).
  - 8-CPU upgrade: 4 processor cards with 8 processor daughterboards (modules).
  - 9-CPU upgrade: 5 processor cards with 9 processor daughterboards (modules).
  - 10-CPU upgrade: 5 processor cards with 10 processor daughterboards (modules).
  - 11-CPU upgrade: 6 processor cards with 11 processor daughterboards (modules).
  - 12-CPU upgrade: 6 processor cards with 12 processor daughterboards (modules).
- Materials for returning the old processor cards to Hewlett-Packard.
- Memory cards if ordered by customer.
- New nameplate.
- Update labels.
- New control panel (front panel).
- This manual.
- The manual *99x/890/T-Class System Firmware Update Guide* (PN A1820-90002)
- Firmware Update Tool (FUT) kits:
  - DDS Kit (DDS or DAT media) PN 5063-3774.
  - CD Kit (CD ROM format) PN 5063-3775.
  - Mag Tape Kit (in standard 1/2-inch media) PN 5063-3776.
- Optional PowerTrust UPSs if ordered by customer.

Updating the Operating System

The 996/T520 requires the correct version of the operating system.

Model	Version
CS T520	HP-UX 10.01 or higher
CS 996	MPE/iX Release 5.0 (VUF C.50.03 or higher)
Note: For support of 9, 10, 11, or 12-way multiprocessing on the 996 server, MPE /iX Release 5.0 requires the following patches: HXY4 and ODIJX25.	

Before proceeding, make sure the operating system has been updated to the required version.

Loading FUT Firmware

This section tells how to load or switch to FUT firmware. See <Undefined Cross-Reference>.

To perform a processor upgrade, you need FUT firmware installed on the Service Processor (SP) card. Firmware Update Tool (FUT) firmware allows any T-Class/99x system to boot to a point where SPU-specific firmware can be loaded.

To load firmware onto an SP card:

1. **Find the name of the firmware you want to load.** To see which versions are available, consult the labels on the Firmware Tape.
2. To see what firmware is on the system, **execute the FV command** at the SP> prompt:

```
Control-B                  /* At the system console
CM> SP                      /* To access the SP> prompt
SP> FV                      /* To display the firmware versions
                            Vers 1.xx = 890/990/992 SPUs
                            Vers 2.xx = 991/995/T500 SPUs
                            Vers 3.xx = 996/T520 SPUs
                            Vers 4.xx = Firmware Update Tool (FUT)
                                   xx = Firmware version number
SP> CO                      /* Return to console mode
```

3. **If FUT firmware is NOT already in the Alternate or Active Bank, load FUT firmware.** Follow the procedure in *99x/T-Class: Firmware Update Guide* (PN A1820-90002). (The procedure is very similar to the procedure for loading SPU-specific firmware.) After executing the UP FWEUPxxx command, allow FUT firmware to reboot. Go to step 7 in this procedure.

NOTE Always use the Firmware Update Tool (FUT) firmware to load SPU-specific hardware. This ensures that FUT firmware is not overwritten, and that FUT firmware is always available on the alternate bank to facilitate repairs and updates.

4. **If FUT firmware is already in the Alternate Bank,** continue with the procedure.

   If FUT firmware is in the Active Bank, go to step 7.

5. **Use the normal shutdown procedure** for HP-UX or MPE/iX. **CAUTION:** Do not reconfigure processors or memory.

6. After the shutdown completes, **execute the SW command** at the SP> prompt:

   ```
   Control-B                    /* At the system console
   CM> SP                        /* To access the SP> prompt
   SP> SW                        /* To switch the firmware banks
   ```

   Answer Y to the warning prompt from the SW command.

7. **If you are changing processor cards** as part of an SPU upgrade:

   a. **Turn the Standby/Ready switch on the top front of the system to the Standby position. (WARNING: Be sure that Standby/Ready switch is in Standby position!)**

   b. **Install the new processor cards** following the instructions that accompany them.

   c. **Turn the Standby/Ready switch to the Ready position.**

   d. **Use the HC command at the SP> prompt** to verify that the processor cards were properly installed. See the manual that accompanies the upgrade kit.

8. **Allow FUT firmware to boot. Put the firmware tape, DDS, or CD-ROM in the drive.** NOTE: Anytime a FUT or PDC menu is not displayed, type a period (.) then **Enter**.

9. When the Firmware Menu appears again, **check the update path displayed in the menu.** The path should point to the tape, DAT/DDS, or CD-ROM device with the firmware tape mounted. **If the update path is incorrect,** change the update path with the command:

   ```
   Firmware> PA U
   ```

10. **Enter the UPDATE FWEmmxxx command** to load ("update") the desired SPU-specific firmware onto the SP card. (Be sure to spell the file name correctly!)

    ```
    Firmware> UP FWEmmxxx     /* where mm  = CX (for 890, 990, 992)
                                             TT (for T500, 991, 995)
                                             TX (for T520, 996)
                                             UP (Firmware Update Tool)
                                        xxx = firmware version number
    ```

11. **Wait until the update process completes (approximately 10 minutes).** Do NOT interrupt the update process.

12. **The computer automatically does a hard reboot** with the newly loaded firmware as the active firmware.

13. To verify that the desired firmware was loaded, **execute the FV command** at the SP> prompt as described earlier. For detailed information, use the VERIFY command in the PDC Firmware Menu.

You now have FUT firmware in the active bank of the SP card.

CAUTION Do not load 996/T520 firmware at this point. Doing so may lead to configuration problems.

Instead follow the order given in this manual: install the new hardware and THEN load 996/T520 firmware.

Installing New Hardware

This section tells how to install the new hardware required for the upgrade.

Shutting Down the System

WARNING **Before starting any installation procedure, ensure that the System Administrator/System Manager has done a system backup and an operating system shutdown.**

To shut down the system:

1. Turn PMB card cage power OFF by setting the control panel "Standby/Ready" switch to "Standby" (the control panel is at the top front of the cabinet).
2. Turn off power to the SPU cabinet by switching the circuit breaker at the bottom right rear of the cabinet to the "off" position.
3. Turn off the power to the Expansion cabinet by setting the power switch to the "off" position (the power switch is at the top front of the cabinet).

CAUTION ESD protection requires the use of a grounded wriststrap when handling the cards. Failure to use the grounded strap may result in card component damage. There are two grounding wriststraps attached to the SPU cabinet (one in the front and one in the rear of the cabinet).

Accessing the Card Cage

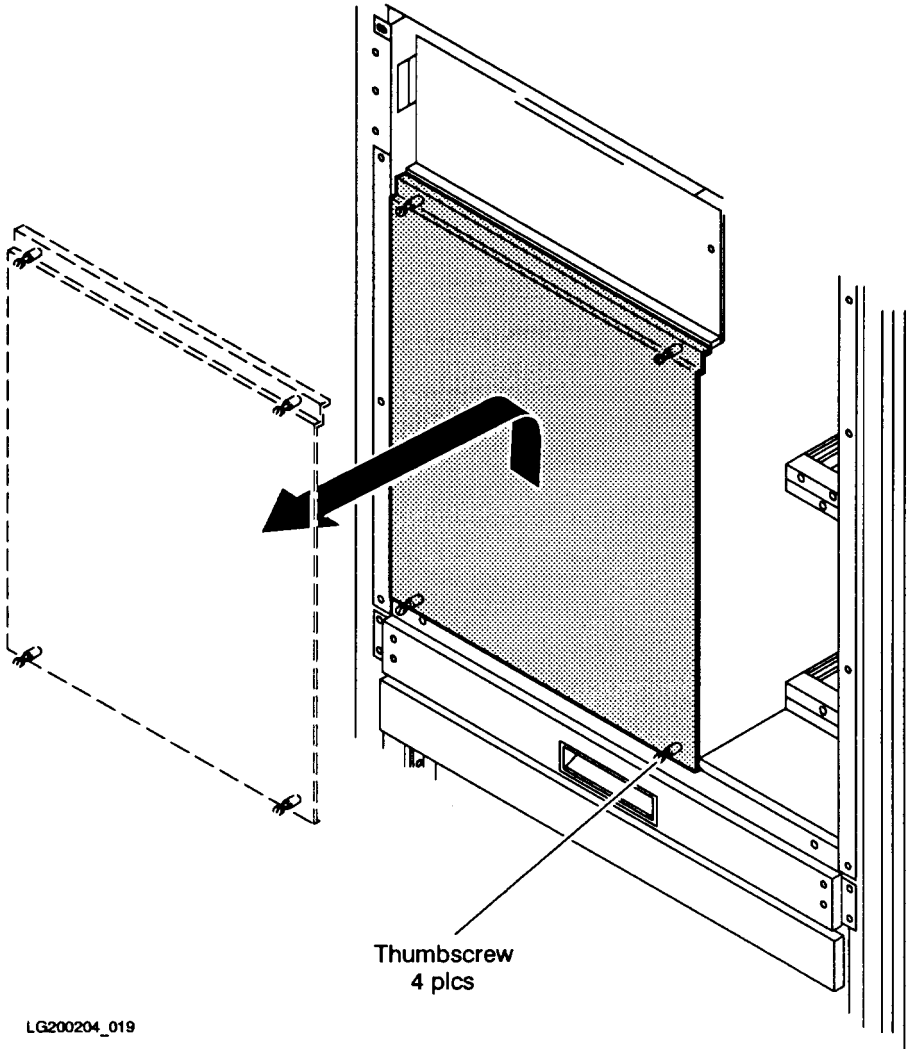
To open the front and rear cabinet doors:

1. Insert the hexagonal cabinet key into the black hexagonal hole on the right of the cabinet door.
2. Rotate the cabinet key about a quarter-turn counter-clockwise.
3. Pull the door open.

Accessing the Front PMB Card Cage Slots (10-15)

A metal plate covers the PMB cards in the front card cage (see Figure 2-3).

Figure 2-3 Front PMB Card Cage Cover Plate (Cabinet Front)



To remove the cover plate from the front PMB card cage:

1. Verify that power to the system is off (refer to "Shutting Down the System"). The rear cabinet circuit breaker should be set to OFF, and the control panel switch set to "Standby."
2. Remove the card cage cover plate by loosening the four (4) thumbscrews (two each at the upper and lower edges) and lifting the cover plate up and out (see Figure 2-3).

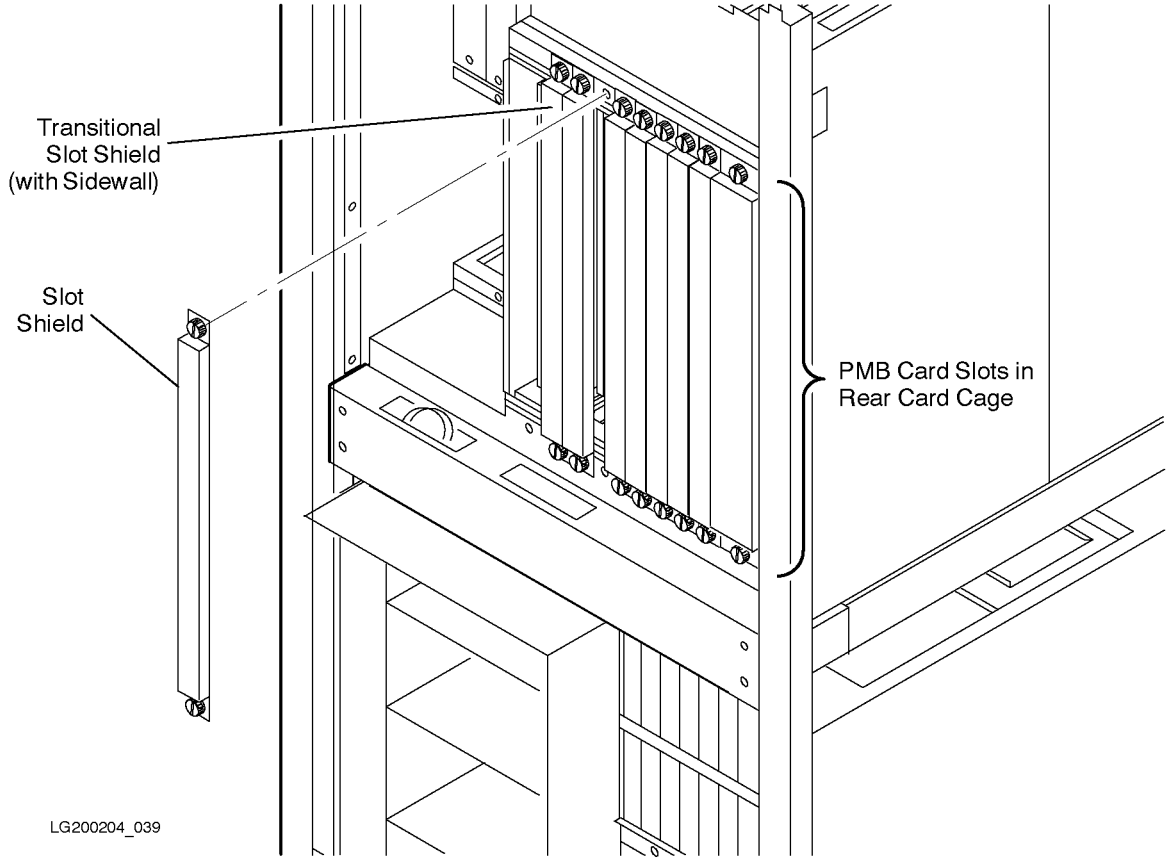
Accessing the Rear PMB Card Cage Slots (1-9)

The rear card cage is not protected by a cover plate. However, individual slots are protected by a metal slot shield (see Figure 2-4).

To remove a metal slot shield from the rear PMB card cage:

1. Verify that power to the system has been removed (refer to "Shutting Down the System"). The rear cabinet circuit breaker should be set to OFF, and the control panel switch set to "Standby."
2. Loosen the two (2) thumbscrews (one at the top edge and one at the bottom edge) of the shield.
3. Pull the metal slot shield away from the card cage.

Figure 2-4 Rear PMB Card Cage Metal Slot Shields (Cabinet Rear)



Processor Card Configuration

New processor cards should be installed according to the following guidelines:

1. The new processor cards should be placed in slots formerly occupied by T500/991/995 processor cards. Once these slots have been occupied, you can place 996/T520 cards in other slots. It does not matter if some slots formerly occupied by T500/991/995 processor cards are not occupied.
2. **T520:** Up to 6 processor cards may occupy PMB card slots 8-15.
3. **996:** Up to 6 processor cards may occupy PMB card slots 10-15.

4. Do not intermix T500/991/995 processor cards and 996/T520 processor cards in the same SPU. The differences between the 996/T520 and T500/991/995 processor cards are shown in Appendix A.

CAUTION Be sure to place new processor cards in slots formerly occupied by T500/991/995 cards. Otherwise you may get error messages or long-term configuration problems.

The guidelines for installing processor cards in 996/T520 systems are:

1. Use PMB card slot 15 for the first processor card.
2. Use the following sequence for installing additional processor cards: PMB slots 14, 13, 12, 11, 10, 9, 8.
3. If a processor card is installed in slots 8 through 11, an additional +5 V 130A (650W) power supply (PN 0950-2229) should be installed in slot P1.

Memory Card Configuration

If the upgrade contains memory cards, determine where to install them. Use the following guidelines to do so:

1. PMB card slot 4 can be used for the first memory card; use slot 6 if slot 4 contains a bus converter card.
2. PMB card slot 6 can be used for the second memory card; use slot 8 if 6 contains a bus converter or memory card.
3. Use the following sequence for installing additional memory cards: PMB slots 9, 10, 11, 12, 13, 14, 7, 5, 3, 2, and 1.

The location of cards in the Processor-Memory Bus (PMB) card cage is shown in Figure 1-2.

Installing the Cards

Once you determine the proper configuration for the new processor and memory cards, install the cards using the following procedure.

CAUTION Be sure the circuit breaker switch on the rear of the cabinet is turned OFF before you install new cards. Otherwise you may get error messages or long-term configuration problems.

To install cards:

1. Verify that power has been removed from the system, as previously described.
2. Remove the cover plate (front card cage) or metal slot shields (rear card cage), as previously described.
3. Be sure you have a grounding wriststrap attached to your wrist.

4. Remove each existing T500/991/995 processor card by lifting the extractor handles out from the card. Slide the card gently out of the cardcage along the slot guides. Insert the old card into an anti-static bag and return it to Hewlett-Packard. Materials for returning the processor cards are included in the upgrade kit.

   All old processor cards MUST be returned to Hewlett-Packard. (By the terms of the upgrade purchase agreement, all old processor cards are the property of Hewlett-Packard and are no longer the property of the customer.)

5. Place the new card in the slot guides, and carefully insert the card into the backplane connector until it is firmly seated.

CAUTION Use extreme care when inserting PMB cards into the backplane. The connectors can be damaged if cards are forcibly inserted into place.

Do not handle the processor card or daughterboard by the cooling fins. Applying pressure to these fins may cause the ceramic to crack.

---

6. For the front PMB card cage, reattach the cover plate:

   a. Place the card cage cover plate lip over the raised edge of the cabinet frame.

   b. Tighten the four thumbscrews on the card cage cover plate with a screwdriver so that they are slightly more than finger-tight. (The torque specification for the thumbscrews is 24 inch-lbs.)

7. For the rear PMB card cage, reattach the metal slot shields:

   a. Place the metal slot shield over the card (or the empty slot) so that the thumbscrews are aligned with the holes in the card cage.

   b. Tighten the thumbscrews on the metal slot shield so that they are slightly more than finger tight. (The torque specification for the thumbscrews is 24 inch-lbs.)

NOTE The card cage cover plate and metal slot shields are required for RFI and EMI emissions control and for proper airflow and cooling.

All rear PMB card cage slots must have a metal slot shield covering the slot, even if the slot has no card installed.

Verifying the Upgrade

To verify the upgrade:

1. Power up the system by turning the Standby/Ready switch to the Ready position and turning the rear circuit breaker switch to ON.
2. Check the control panel indicator to see that the correct number of processors is reported.

3. After several minutes — the total time depends on the amount of memory the system has — the initial FUT screen appears on the system console:

```
------------------------------------------------------------------------------
                        FUT - Firmware Update Tool
                              Version 4.82
                        (c) Copyright 1990-1995
                       The Hewlett-Packard Company
                           All rights reserved

------------------------------------------------------------------------------
------- Firmware Commands

        +-----------------------------------------------------------+
        | NOTICE!!   A successful UPDATE will change the version    |
        |            of firmware and hardboot the system.           |
        +-----------------------------------------------------------+

        Values stored in Stable Storage:
            Update Path:           0/52.4.0.0.0.0.0

        Commands Available

        PA Path:        Change the update path (PA U )
        VE Verify:      List firmware revisions
        UP Update:      Update inactive firmware from LIF (UP )
        SC Scan IO:     Display IO devices

        HE Help:        Display help text on menu selections

-------
Firmware>
```

4. Enter the HC command at the SP prompt. You see a display similar to the following:

```
Control-B                  /* At the system console
CM> SP                    /* To access the SP> prompt
SP> HC                    /* To show the hardware configuration

Host Hardware Configuration:   (D = deconfigure; - = non-existent port)
-------------------------------------------------------------------
|      |                 | Deconfigured      | Ports to be decnf |
| PMB  |                 | Ports             | at next boot      |
| Slot | Board Type      |  0 |  1 |  2 |  3 |  0 |  1 |  2 |  3 |
|------------------------------------------------------------------|
|   0  | Bus Converter   |    |  - |    |  - |    |  - |    |  - |
|   7  | Memory          |    |    |  - |  - |    |    |  - |  - |
|  12  | NITRO Processor |    |    |  - |  - |    |    |  - |  - |
-------------------------------------------------------------------

Enter the slot # of the module whose configuration is to be changed
(CR = exit):
```

a. Enter the BA command at the SP prompt to disable the battery.

   Because the batteries are removed, the yellow LED on the PFC high voltage power supply blinks. This is normal and should not be construed as a warning.

b. Verify that each new processor card has an entry in the HC display. For example, the above HC display has an entry for the processor card in PMB slot 12.

c. Verify that the entry for each processor card has the correct number of ports configured. If a processor card has one processor module, one port will be configured. If a processor card has two processor modules, two ports will be configured.

   For example, the HC display for a processor card with two processor modules should show two modules present. Ports 0 and 1 in the table (= modules 0 and 1) should be blank to indicate that they are present. Ports 2 and 3 in the table should have a hyphen (-) to indicate that they are non-existent.

d. If a processor entry shows FOUR of the ports (modules) as present (if ports 0 - 3 all are blank in the table), there has been a configuration error.

   To fix a configuration error, turn the Standby/Ready switch to the Standby position and turn off circuit breaker switch. Place one processor card into a new slot location. Power up.

Installing New SPU Firmware

Previously you loaded the Firmware Update Tool (FUT) firmware. Then you installed and verified the new T500/991/995 processors. In this procedure, you use FUT to load firmware for the new processors.

To load FUT firmware onto an SP card:

1. To see if FUT firmware is already on the system, **execute the FV command** at the SP> prompt:

```
Control-B                   /* At the system console
CM> SP                      /* To access the SP> prompt
SP> FV                      /* To display the firmware versions
                            Vers 1.xx = 890/990/992 SPUs
                            Vers 2.xx = 991/995/T500 SPUs
                            Vers 3.xx = 996/T520 SPUs
                            Vers 4.xx = Firmware Update Tool (FUT)
                                  xx = Firmware version number
SP> CO                      /* Return to console mode
```

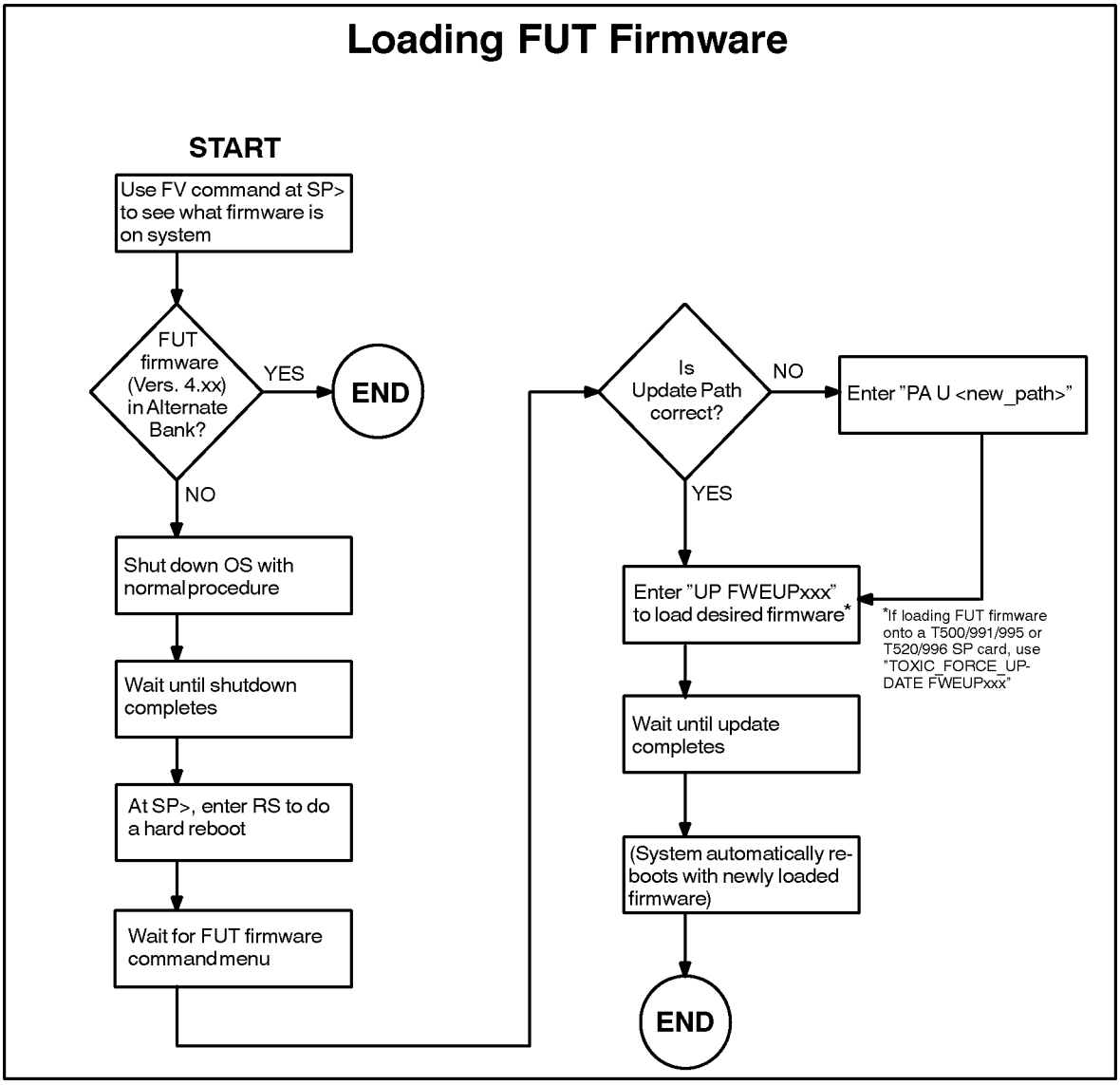
2. **If FUT firmware is already in the Alternate Bank,** there is no need to continue with this procedure.
3. **If FUT firmware is NOT already in the Alternate Bank, load FUT firmware**; continue with this procedure.
4. **Use the normal shutdown procedure** for HP-UX or MPE/iX.
5. After the shutdown completes, **execute the RS command** at the SP> prompt to perform a hard reboot.

Control-B
```
CM> SP
SP> RS                    /* hard reboot (ReSet)
```

6. **If you see the message** "Processor is starting the autoboot process," **press any key within 10 seconds.** (HP-UX systems commonly have the autoboot flag set.)
7. At the PDC prompts ("Continue with primary boot path?", "Continue with alternate boot path?"), press **N**discontinue the boot process and enter the PDC user interface.
8. At the PDC Main Menu, **enter FI** to call up the Firmware Menu.

   NOTE: Anytime a PDC or FUT menu is not displayed, type period (.) then **Enter.**
9. When the PDC Firmware Menu appears, **check the update path displayed in the menu.** The path should point to the tape, CD, or DAT/DDS device with the firmware tape mounted. **Put the firmware tape, CD, or DDS in the drive.**

Figure 2-5Steps for Loading FUT Firmware Onto the SP Card



emfu003

10. **If the update path is incorrect,** change the firmware update path with the command:

```
Firmware> PA U
```

11. **Enter the UPDATE FWEUPxxx command** to load FUT firmware onto the SP card. (Be sure to spell the file name correctly!)

```
Firmware> UP FWEUPxxx     /* where  xxx = firmware version number
```

NOTE EXCEPTION: **If you are loading FUT firmware onto an SP card that contains 991/995/T500 firmware (PDC Vers. 2.xx) or 996/T520 firmware (PDC Vers. 3.8x)**, use this command instead:

```
TOXIC_FORCE_UPDATE FWEUPxxx.
```

12. **Wait until the update process completes (approximately 10 minutes).** Do NOT interrupt the update process. The system will automatically reboot with the newly loaded FUT firmware as the active firmware.

13. To verify that the FUT firmware was loaded, **execute the FV command:**

```
Control-B                  /* At the system console
CM> SP                     /* To access the SP> prompt
SP> FV                     /* To display the firmware versions
                           Vers 1.xx = 890/990/992 SPUs
                           Vers 2.xx = 991/995/T500 SPUs
                           Vers 3.xx = 996/T520 SPUs
                           Vers 4.xx = Firmware Update Tool (FUT)
                                  xx = Firmware version number
SP> CO                     /* Return to console mode
```

(For detailed information, use the VERIFY command in the Firmware Menu.)

14. **If you are going to load SPU-specific firmware** (for example if you are performing a processor upgrade), go to step 7 in the procedure for loading SPU-specific firmware earlier in this chapter.

15. **If you are NOT going to load new SPU-specific firmware** (for example, if you are loading FUT onto a system without doing a processor upgrade), execute the SW command at the SP prompt.

```
Control-B                  /* At the system console
CM> SP                     /* To access the SP> prompt
SP> SW                    /* To switch firmware banks (to FUT) & reboot
```

Answer Y to the warning prompt from the SW command.

Initializing Internal Values with SS_CONFIG

Use the SS_CONFIG utility to set the appropriate values for the system parameters.

Adding Upgrade Labels

After completing the upgrade, three upgrade labels must be applied to the system to identify the system as an upgraded system. See <Undefined Cross-Reference>.

- The Serial Number Label at the upper left of the rear door.
- The System Information Label at the lower right of the rear door.
- A third label inside the cabinet in roughly the same position as the System Information Label.

There are two sets of upgrade labels. One set is marked "SET I" and the other "SET II." If this is the first upgrade of the system, use the labels marked SET I. If this is the second upgrade of the system (a CS 890 has been upgraded to a CS T500 and is now being upgraded to a CS T520, or a CS 990 (or CS 992) has been upgraded to a CS 995 and is now being upgraded to a CS 996), use the labels marked SET II.

Apply each upgrade label over the existing label that corresponds to it (for example, apply the upgrade Serial Number Label over the existing Serial Number Label). The best way to align the labels is to position the HP logo on the new label over the HP logo on the existing label. The top two lines of the existing label (including the model number) should be covered. The serial number should NOT be covered.

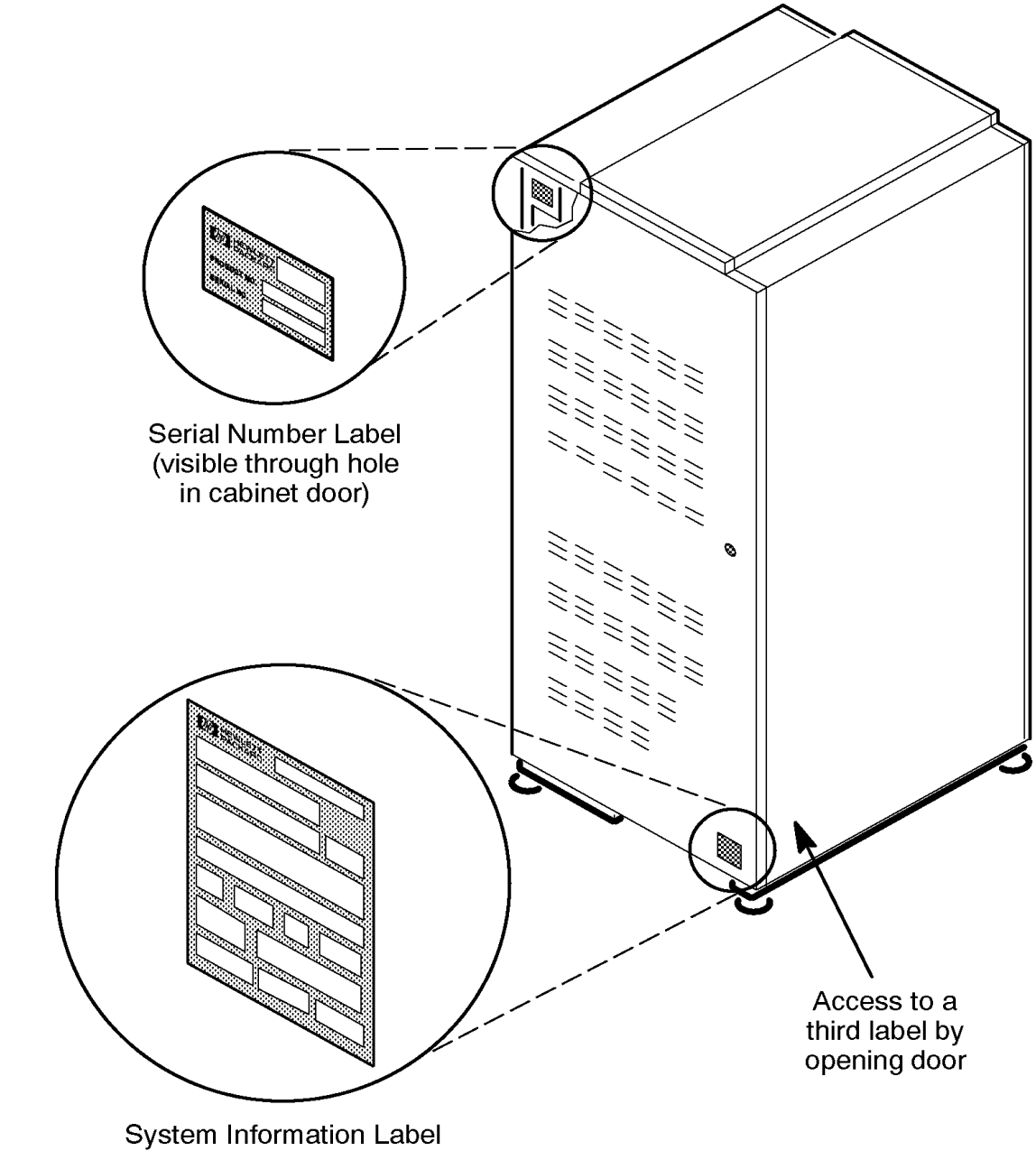
NOTE Make sure that the serial and model numbers on the existing label are NOT covered by the upgrade label.

Installing the PowerTrust Unit (Optional)

If a PowerTrust unit is to be installed into the system, now is the time to install it. Refer to the *PowerTrust System Guide* that came with the UPS.

CAUTION Back-up power for 996/T520 systems are provided by the PowerTrust unit or some other uninterruptible power source (UPS). The system will have no back-up power until the PowerTrust unit or another UPS is installed.

Figure 2-6 System Information Label Location



3 Adding More Processors

This chapter describes how to add more processors and memory to an HP 9000 CS T520 or a HP 3000 CS 996 system.

Adding processors and memory to an existing 996/T520 System is similar to the upgrade process described in the previous chapter. However, there is no need to load new firmware.

Chapter Contents

The chapter is organized as follows:

- Upgrade Kits.
- Upgrade Overview.
- Upgrade Procedure.
  - Verifying the Contents of the Kit.
  - Installing New Hardware.
  - Initializing Internal Values with SS_CONFIG.
  - Adding Upgrade Labels

Upgrade Kits

Table 3-1 CS T520 Field Upgrades

Product Number	Option	Description
A3358A	Opt. 102	Upgrade from 1-CPU to 2-CPU SMP system
	Opt. 103	Upgrade from 2-CPU to 3-CPU SMP system
	Opt. 104	Upgrade from 3-CPU to 4-CPU SMP system
	Opt. 105	Upgrade from 4-CPU to 5-CPU SMP system
	Opt. 106	Upgrade from 5-CPU to 6-CPU SMP system
	Opt. 107	Upgrade from 6-CPU to 7-CPU SMP system
	Opt. 108	Upgrade from 7-CPU to 8-CPU SMP system
	Opt. 109	Upgrade from 8-CPU to 9-CPU SMP system
	Opt. 110	Upgrade from 9-CPU to 10-CPU SMP system
	Opt. 111	Upgrade from 10-CPU to 11-CPU SMP system
	Opt. 112	Upgrade from 11-CPU to 12-CPU SMP system
A2233A		Add 128-MB ECC memory board
A2234A		Add 256-MB ECC memory board
A2588A		Add 512-MB ECC memory board
A2589A		Add 768-MB ECC memory board

Table 3-2 CS 996 Field Upgrades

Product Number	Description
SSP# A3394A	Corporate Business System 996 Field Upgrades
A3387A	Upgrade from 1 CPU 996/80 SMP Server to a 1 CPU 996/100 Server
A3443A	Upgrade from 1-CPU 996/100 SMP Server to a 2-CPU 996/200 SMP Server
A3444A	Upgrade from 2-CPU 996/200 SMP Server to a 3-CPU 996/300 SMP Server
A3445A	Upgrade from 3-CPU 996/300 SMP Server to a 4-CPU 996/400 SMP Server
A3446A	Upgrade from 4-CPU 996/400 SMP Server to a 5-CPU 996/500 SMP Server
A3447A	Upgrade from 5-CPU 996/500 SMP Server to a 6-CPU 996/600 SMP Server
A3448A	Upgrade from 6-CPU 996/600 SMP Server to a 7-CPU 996/700 SMP Server

Product Number	Description
A3449A	Upgrade from 7-CPU 996/700 SMP Server to a 8-CPU 996/800 SMP Server
A3755A	Upgrade from 8-CPU 996/800 SMP Server to a 9 CPU 996/900 SMP Server
A3756A	Upgrade from 9-CPU 996/900 SMP Server to a 10 CPU 996/1000 SMP Server
A3757A	Upgrade from 10 -CPU 996/1000 SMP Server to a 11 CPU 996/1100 SMP Server
A3758A	Upgrade from 11-CPU 996/1100 SMP Server to a 12 CPU 996/1200 SMP Server
A2233A	Add 128-MB ECC memory board
A2234A	Add 256-MB ECC memory board
A2588A	Add 512-MB ECC memory board
A2589A	Add 768-MB ECC memory board

Upgrade Overview

The following is a summary of the steps required to add processors/memory to an *existing* 996/T520.

1. Verify the contents of the upgrade kit.
2. Shut down the system by turning the Standby/Ready switch to the Standby position and turning the rear circuit breaker switch to OFF.
3. Access the PMB card cage.
4. Install the processor cards from the kit into the appropriate PMB slots.
5. If the upgrade kit contains a new processor daughterboard to add to an existing processor card:
   - Remove the processor card which currently has only one daughterboard attached.
   - Install the daughterboard onto the processor card.
6. If this is an upgrade to 9, 10, 11, or 12 processors, install a new +5 V 130A (650W) power supply in slot P1.
7. If appropriate, add upgrade memory cards in the appropriate PMB slots.
8. Power up the system by turning the Standby/Ready switch to the Ready position and turning the rear circuit breaker switch to ON.
9. Verify the installation of processor and memory cards:
   - Verify that the control panel reports the new number of processors.
   - Verify that the initial PDC display reports the new number of processors and amount of memory.
   - Verify the proper configuration of processors by executing the HC command at the SP> prompt. A maximum of two modules per card should be reported as present.
   - (Recommended) Run the EDPROC offline diagnostic from the Support Tape (on MPE/iX systems, the EDPROC diagnostic is available from the boot disk). If you installed new memory cards, run MEMTEST at the PDC interface.
10. Use the SS_CONFIG utility to set the appropriate values for the system parameters.
11. Add upgrade labels to the SPU.

Upgrade Procedure

The remainder of this chapter provides detailed steps on how to add processors/memory to an *existing* 996/T520 system.

Verifying the Contents of the Kit

Verify that the upgrade kit contains:

- Processor cards and daughterboards:

  The number of processor cards and daughterboards you receive will depend on how many processors were ordered:

  - Upgrades to 2, 4, 6, 8, 10, or 12 processors: one daughterboard (module) and one processor card (with two daughterboards already mounted) for every (n-1)/2 processors you are adding (where *n* is the total number of processors you are adding). For example, if you have one processor and you are adding one, you should receive one processor daughterboard only. If you have one processor and you are adding five processors (for a total of six), you should receive one processor daughterboard and two processor cards (each with two daughterboards already mounted).
  - Upgrades to 3, 5, 7, 9, or 11 processors: one processor board with one daughterboard already mounted and one processor card with two daughterboards already mounted for every (n-1)/2 processors you are adding. For example, if you have two processors and you are adding three processors (for a total of five), you should receive two processor cards: one with one daughterboard already mounted, and one with two daughterboards mounted.
  - Upgrade to 9, 10, 11, or 12 processors: One +5 V 130A (650W) power supply.
- Memory cards if ordered by customer.
- Upgrade labels if supplied.
- This manual.
- Firmware Update Tool (FUT) kits:
  - DDS Kit (DDS or DAT media) PN 5063-3774.
  - CD Kit (CD ROM format) PN 5063-3775.
  - Mag Tape Kit (in standard 1/2-inch media) PN 5063-3776.

Installing New Hardware

This section tells how to install the new hardware required for the upgrade.

Shutting Down the System

WARNING **Before starting any installation procedure, ensure that the System Administrator/System Manager has done a system backup and an operating system shutdown.**

To shut down the system:

1. Turn PMB card cage power OFF by setting the control panel power switch to "Standby" (the control panel is at the top front of the cabinet).

   Hazardous voltage and energy are still present in the cabinet with the control panel switch in the "Standby" position. To completely remove AC power to the system, switch the circuit breaker at the bottom right rear of the cabinet to the "Off" position.

2. Turn Expansion cabinet power off by setting the power switch to the "off" position (the power switch is at the top front of the cabinet). If the Expansion cabinet does not have a power switch, turn the UPS Output switch to OFF.

CAUTION ESD protection requires the use of a grounded wriststrap when handling the cards. Failure to use the grounded strap may result in card component damage. There are two grounding wriststraps attached to the SPU cabinet (one in the front and one in the rear of the cabinet).

Accessing the Card Cage

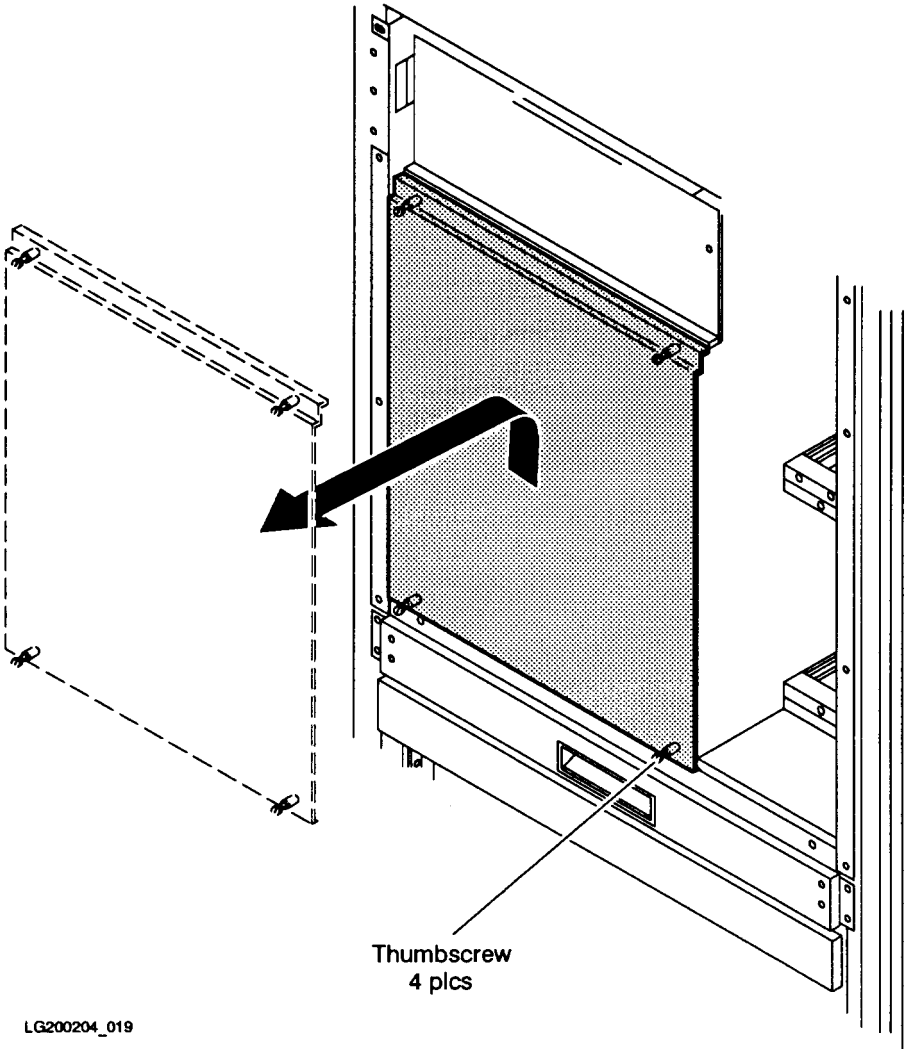
To open the front and rear cabinet doors:

1. Insert the hexagonal cabinet key into the black hexagonal hole on the right of the cabinet door.
2. Rotate the cabinet key about a quarter-turn counter-clockwise.
3. Pull the door open.

Accessing the Front PMB Card Cage Slots (10-15)

A metal plate covers the PMB cards in the front card cage (see Figure 3-1).

Figure 3-1 Front PMB Card Cage Cover Plate (Cabinet Front)



To remove the cover plate from the front PMB card cage:

1. Verify that power to the system has been removed (refer to "Shutting Down the System"). The rear cabinet circuit breaker should be set to OFF, and the control panel switch set to "Standby."
2. Remove the card cage cover plate by loosening the four (4) thumbscrews (two each at the upper and lower edges) and lifting the cover plate up and out (see Figure 3-1).

To replace the cover plate:

1. Place the card cage cover plate lip over the raised edge of the cabinet frame.
2. Tighten the four thumbscrews on the card cage cover plate with a screwdriver so that they are more than finger-tight. (The torque specification for the thumbscrews is 24 inch-lbs.)

Accessing the Rear PMB Card Cage Slots (1-9)

The rear card cage is not protected by a cover plate. However, individual slots are protected by a metal slot shield (see Figure 3-2).

To remove a metal slot shield from the rear PMB card cage:

1. Verify that power to the system has been removed (refer to "Shutting Down the System"). The rear cabinet circuit breaker should be set to OFF, and the control panel switch set to "Standby."
2. Loosen the two (2) thumbscrews (one at the top edge and one at the bottom edge) of the shield.
3. Pull the metal slot shield away from the card cage.

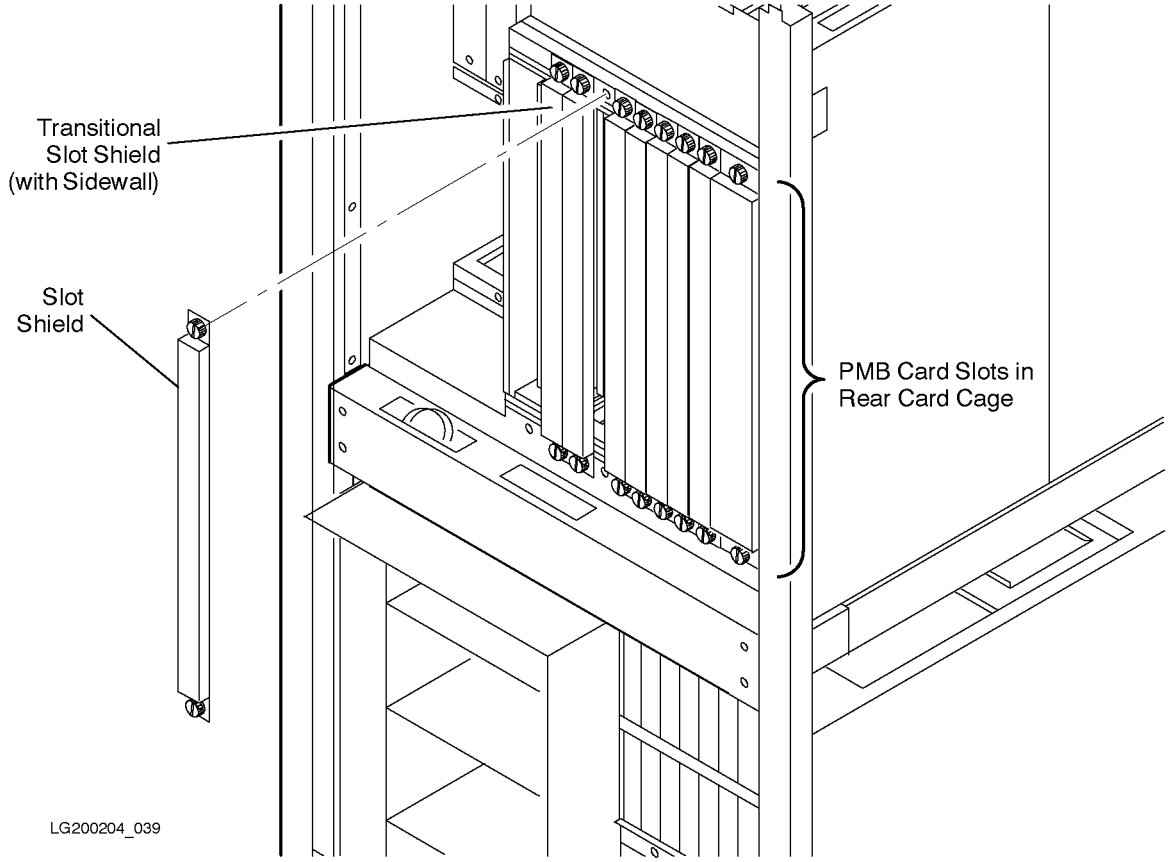
To replace a metal slot shield:

1. Place the metal slot shield over the card (or the empty slot) so that the thumbscrews are aligned with the holes in the card cage.
2. Tighten the thumbscrews on the metal slot shield slightly more than finger tight (or to a torque specification of 24 inch-lbs).

NOTE The card cage cover plate and metal slot shields are required for RFI and EMI emissions control and for proper airflow and cooling.

All rear PMB card cage slots must have a metal slot shield covering the slot, even if the slot has no card installed.

Figure 3-2 Rear PMB Card Cage Metal Slot Shields (Cabinet Rear)



Mounting Processor Daughter Board

If the customer ordered an upgrade to 2, 4, 6, or 8 processors, you mount the processor daughterboard (module) in the upgrade kit to an existing processor card.

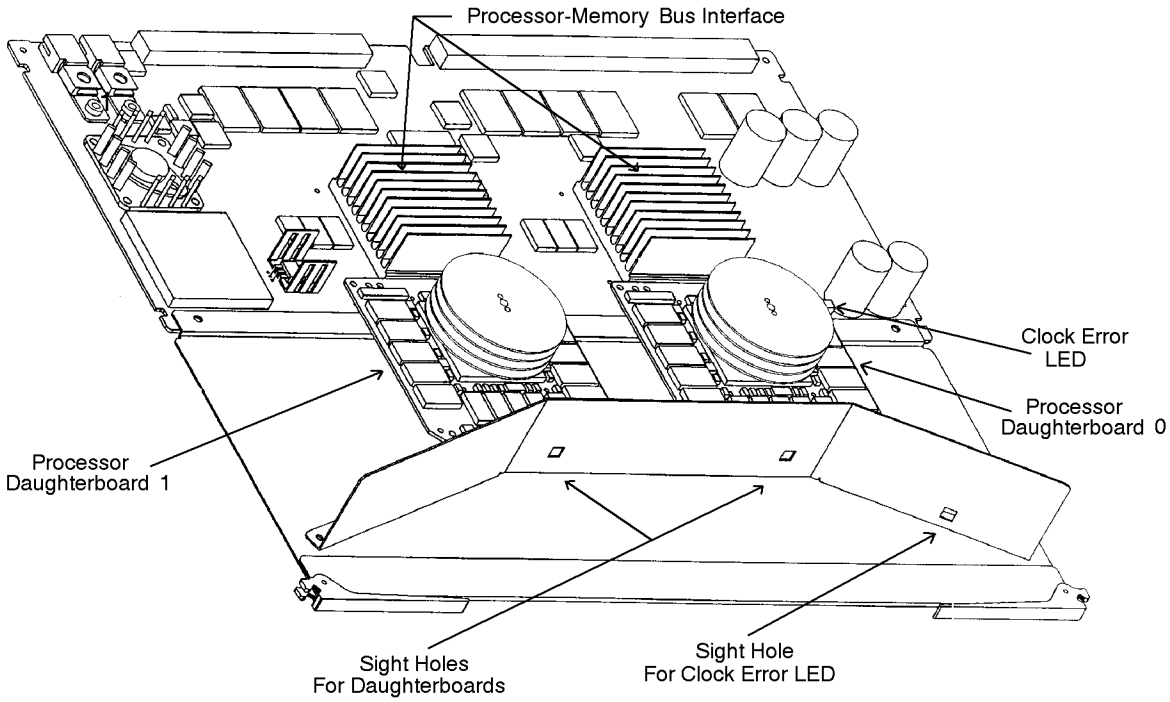
For T520 upgrades, options #102, #104, #106, #108, #110, and #112 correspond to upgrades to 2, 4, 6, 8, 10, and 12 processors, respectively.

For 996 upgrades, Product Numbers A3443A, A3445A, A3447A, A3449A, A3756A, and A3758A correspond to upgrades to 2, 4, 6, 8, 10, and 12 processors, respectively.

To mount a processor daughterboard (module):

1. Verify that power has been removed from the system, as previously described.
2. Remove the cover plate (front card cage) or metal slot shields (rear card cage), as previously described.
3. Make sure you are wearing an anti-static wriststrap.
4. Look in the PMB cardcage to find the processor card with only one processor daughterboard. See Figure 3-3.

Figure 3-3T520/996 Processor Card



emsuS01

5. Remove the processor card with only one processor daughterboard:
   a. Remove the card from the backplane by lifting the extractor handles out from the card.
   b. Slide the card gently out of the cardcage along the slot guides.
   c. Place the card on an anti-static surface.

CAUTION Do not handle the processor card or daughterboard by the cooling fins. Applying pressure to these fins may cause the ceramic to crack.

6. Carefully align, then mate the edge connectors on the processor daughterboard to the connectors on the processor card.
7. Secure the processor daughterboard to the processor card with the four screws that accompany the daugherboard. Tighten the screws finger-tight (10 in-lbs). (The four screws are M3x10mm, PN 0515-2134).
8. Replace the processor card in the PMB cardcage as described in the section "Installing the Cards" later in this chapter.

CAUTION On processor cards with only one processor daughterboard (module), the daughterboard must occupy the lower position on the card. The lower position is defined as the bottom-most position when the processor card is installed in the card cage.

Processor cards shipped from the factory should have the processor daughterboards already installed in the correct position.

Processor Card Configuration

The guidelines for installing processor cards in T520/996 systems are:

1. Use PMB card slot 15 for the first processor card.
2. Use the following sequence for installing additional processor cards: PMB slots 14, 13, 12, 11, 10, 9, 8.
3. If a processor card is installed in slots 8 through 11, install an additional +5 V 130A (650W) power supply (PN 0950-2229).

Configuration Limits for T520/996 Computers with 8+ CPUs

If more than 8 CPUs are configured for a T520/996 computer, the number of memory and/or BC cards must be reduced due to PMB slot limitations. Refer to Table 3-1 for configuration combinations.

The table shows the maximum number of CPUs that can be configured in the T520/996 cabinet for a given number of memory cards and BC cards.

Table 3-3 Model T520/996 Configuration Limits for CPU, Memory, and BC Cards

# of BC Cards	# of Memory Cards							
	1	2	3	4	5	6	7	8
1	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs
2	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs
3	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	10 CPUs
4	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	12 CPUs	10 CPUs	8 CPUs

Upgrades to 9 Processors: Install Power Supply

If this is an upgrade to 9, 10, 11, or 12 processors, install a new +5 V 130A (650W) power supply in slot P1.

Memory Card Configuration

If the upgrade contains memory cards, refer to *890/990/992 Add-On Memory Installation Guide* (PN A1809-90005) for complete instructions on how to install them.

Installing the Cards

Once you determine the proper configuration for the new processor and memory cards, install the cards using the following procedure.

CAUTION Be sure the circuit breaker switch on the rear of the cabinet is turned OFF before you install new cards. Otherwise you may encounter error messages or long-term configuration problems.

To install cards:

1. Verify that power has been removed from the system, as previously described.
2. Remove the cover plate (front card cage) or metal slot shields (rear card cage), as previously described.
3. Be sure you have a grounding wriststrap attached to your wrist.

CAUTION Do not handle the processor card or daughterboard by the cooling fins. Applying pressure to these fins may cause the ceramic to crack.

4. Place the new card in the slot guides, and carefully insert the card into the backplane connector until it is firmly seated.

CAUTION Use extreme care when inserting PMB cards into the backplane. The connectors can be damaged if cards are forcibly inserted into place.

5. For the front PMB card cage, reattach the cover plate:
   a. Place the card cage cover plate lip over the raised edge of the cabinet frame.
   b. Tighten the four thumbscrews on the card cage cover plate with a screwdriver so that they are more than finger-tight. (The torque specification for the thumbscrews is 24 inch-lbs.)
6. For the rear PMB card cage, reattach the metal slot shields:
   a. Place the metal slot shield over the card (or the empty slot) so that the thumbscrews are aligned with the holes in the card cage.
   b. Tighten the thumbscrews on the metal slot shield to sllightly more than figer tight (or to a torque specification of 24 inch-lbs).

NOTE The card cage cover plate and metal slot shields are required for RFI and EMI emissions control and for proper airflow and cooling.

All rear PMB card cage slots must have a metal slot shield covering the slot, even if the slot has no card installed.

Verifying the Upgrade

To verify the upgrade:

1. Power up the system by turning the Standby/Ready switch to "Ready" and the rear circuit breaker switch to ON.
2. Check the control panel indicator to see if the correct number of processors is reported.

3. After several minutes, the initial PDC screen will be displayed on the system console:

```
------------------------------------------------------------------------
                      PDC - Processor Dependent Code
                              Version x.xx
                       (c) Copyright 1990-1995
                      The Hewlett-Packard Company
                          All rights reserved
------------------------------------------------------------------------
             Total Memory:        128 MB
             Total Bus Converters: 2
             Total Processors:    2

             Primary Boot Path:     0/52.0.0.0.0.0.0
                                       0 means BC 0 in PMB slot 0
                                      52 means I/O card in HP-PB slot 13
                                       0 means device ID of 0

             Alternate Boot Path:    0/36.1.0.0.0.0.0
             Console/Keyboard Path:  0/44.0.0.0.0.0.0
------------------------------------------------------------------------
```

4. Look at the "Total Memory" and "Total Processors" fields to see if the system recognizes the processor and memory you added. These fields are shaded in the above example.

5. Enter the HC command at the SP prompt. You see a display similar to the following:

```
Control-B                  /* At the system console
CM> SP                     /* To access the SP> prompt
SP> HC                     /* To show the hardware configuration

Host Hardware Configuration:   (D = deconfigure; - = non-existent port)
-------------------------------------------------------------------
|      |                 | Deconfigured      | Ports to be decnf |
| PMB  |                 | Ports             | at next boot      |
| Slot | Board Type      |  0 |  1 |  2 |  3 |  0 |  1 |  2 |  3 |
|------------------------------------------------------------------|
|   0  | Bus Converter   |    |  - |    |  - |    |  - |    |  - |
|   7  | Memory          |    |    |  - |  - |    |    |  - |  - |
|  12  | NITRO Processor |    |    |  - |  - |    |    |  - |  - |
-------------------------------------------------------------------

Enter the slot # of the module whose configuration is to be changed
(CR = exit):
```

   a. Verify that each new processor card has an entry in the HC display. For example, the above HC display has an entry for the processor card in PMB slot 12.

   b. Verify that the entry for each processor card has the correct number of ports configured. If a processor card has one processor module, one port will be configured. If a processor card has two processor modules, two ports will be configured.

For example, the HC display for a processor card with two processor modules should show two modules present. Ports 0 and 1 in the table (= modules 0 and 1) should be blank to indicate that they are present. Ports 2 and 3 in the table should have a hyphen (-) to indicate that they are non-existent.

c. If a processor entry shows FOUR of the ports (modules) as present (if ports 0 - 3 all are blank in the table), there has been a configuration error.

   To fix a configuration error, turn the Standby/Ready switch to the Standby position and turn off circuit breaker switch. Place one processor card into a new slot location. Power up.

6. (Recommended) Run the EDPROC offline diagnostic from the Support Tape (on MPE/iX systems, the EDPROC diagnostic is available from the boot disk). If you installed new memory cards, run MEMTEST at the PDC interface.

Initializing Internal Values with SS_CONFIG

Use the SS_CONFIG utility to set the appropriate values for the system parameters. (Usually not necessary for the T520. Necessary in some cases for the 996.)

Adding Upgrade Labels

If labels are supplied with the upgrade kit, apply them now. See Figure 3-4. To apply the labels, use the procedure described in "Adding Upgrade Labels" in Chapter 2.

Figure 3-4 System Information Label Location