

AlphaServer 4000/4100 System Drawer Upgrades

Order Number: EK-4041A-UI. A01

Use this manual as a quick reference to upgrade system drawers in the AlphaServer 4000/4100 family.

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Contents

Preface	iv
---------------	----

Chapter 1 Overview

1.1 Record System Information	1-2
1.2 Save Information to Diskette	1-4

Chapter 2 Installing the Upgrade

2.1 Remove Old System Drawer (Cabinet)	2-2
2.2 Remove Old System Drawer (Pedestal)	2-4
2.3 Transfer I/O Option Cards	2-6
2.4 Transfer CPU and Memory Cards	2-8
2.5 Install New System Drawer (Cabinet)	2-14
2.6 Install New System Drawer (Pedestal)	2-16

Chapter 3 Verification

3.1 Restore System Information	3-2
3.2 Update Firmware	3-4

Examples

1-1 Show Commands	1-2
1-2 Saving Information to Diskette	1-4
3-1 Restoring Environment Variables	3-2
3-2 Updating Firmware with LFU Command	3-4
3-3 Updating Firmware Using Boot DKA500 Command	3-8

Figures

2-1 Removing the System Drawer (Cabinet)	2-2
2-2 Removing the System Drawer (Pedestal)	2-4
2-3 Removing the Pedestal Tray	2-5
2-4 Removing an I/O Option Card	2-6
2-5 Removing a CPU Card	2-8
2-6 Removing a Memory Card	2-9

2-7 System Drawer Retaining Brackets2-10
2-8 Interlock Mechanism (Rear).....2-11
2-9 Installing New System Drawer (Pedestal).....2-12

Tables

1 AlphaServer 4000/4100 Documentationvi

Intended Audience

This manual is written for field service personnel.

Document Structure

This manual uses a structured documentation design. Topics are organized into small sections for efficient online and printed reference. Each topic begins with an abstract. You can quickly gain a comprehensive overview by reading only the abstracts. Next is an illustration or example, which also provides quick reference. Last in the structure are descriptive text and syntax definitions.

This manual has three chapters, as follows:

- **Chapter 1, Overview**, describes the upgrade and the tools you will need.
- **Chapter 2, Installing the Upgrade**, gives the system drawer removal and installation procedures for cabinet systems and pedestal systems.
- **Chapter 3, Verification**, describes the upgrade verification procedure.

Documentation Titles

Table 1 lists the books in the AlphaServer 4000/4100 documentation set.

Table 1 AlphaServer 4000/4100 Documentation

Title	Order Number
AlphaServer 4100 User and Configuration Documentation Kit	QZ-00VAA-GZ
<i>System Drawer User's Guide</i>	EK-4100A-UG
<i>Configuration and Installation Guide</i>	EK-4100A-CG
AlphaServer 4000 User and Configuration Documentation Kit	QZ-00VAB-GZ
<i>System Drawer User's Guide</i>	EK-4000A-UG
<i>Configuration and Installation Guide</i>	EK-4100A-CG
Service Information	
<i>AlphaServer 4000/4100 Service Manual</i> (hard copy)	EK-4100A-SV
<i>Service Manual</i> (diskette)	AK-QXBJA-CA
Reference Information	
<i>2T-RMSMC System Management Station Kit Installation Guide</i>	EK-RMSMC-IN
<i>KN30n CPU Installation Card</i>	EK-KN300-IN
<i>MS3n0 Memory Installation Card</i>	EK-MS300-IN
<i>H7291 Power Supply Installation Card</i>	EK-H7291-IN
<i>ServerWORKS Manager Administrator User's Guide</i>	ER-4QXAA-UA

Chapter 1

Overview

There are several upgrades in the AlphaServer 4000/4100 family that involve exchanging the system drawers. This manual describes system drawer upgrades in both AlphaServer 4000/4100 cabinet and pedestal systems. You will need a small Phillips screwdriver and a small flathead screwdriver.

Before starting the hardware installation, check the system configuration and record the system serial number and environment variables. Sections in this chapter include:

- Record System Information
- Save Information to Diskette

1.1 Record System Information

Update the operating system software and get a hardcopy of the system configuration, serial number, and environment variables. At the SRM console prompt, issue show commands to obtain this information.

Example 1-1 Show Commands

```
P00>>> show config ❶
                Digital Equipment Corporation
                AlphaServer 4000

Console V2.0-1 OpenVMS PALcode V1.18-8, Digital UNIX PALcode V1.21-12

Module                                     Type      Rev       Name
System Motherboard                         0         0000     mthrbrd0
Memory 128 MB SYNC                         0         0000     mem0
Memory 128 MB SYNC                         0         0000     mem1
CPU (1MB Cache)                           1         0000     cpu0
CPU (1MB Cache)                           1         0000     cpu1
Bridge (IOD0/IOD1)                        600       0021     iod0/iod1
PCI Motherboard                             8         0000     saddle0

PCI0 (IOD0)
Slot   Option Name                           Type      Rev       Name
1      PCEB                                4828086   0004     pceb0
2      DEC PCI MC                          181011    008B     mc0
4      DEC PCI FDDI                        f1011     0000     pfi0
5      PBXGA-AA                             41011     0003     tga0

eisa0 (EISA connected to pceb0)
Slot   Option Name                           Type      Rev       Name

PCI1 (IOD1)
Slot   Option Name                           Type      Rev       Name
1      NCR 53C810                            11000     0002     ncr0
2      DEC KZPSA                             81011     0000     kzpsa0
3      NCR 53C810                            11000     0002     ncr1
4      DECchip 21040-AA                       21011     0023     tulip0

P00>>> show * ❷
auto_action                                HALT
boot_dev
boot_file
boot_osflags
boot_reset                                OFF
```



```
bootdef_dev
booted_dev
booted_file
booted_osflags
cda0                                dka500.5.0.1.1
```

[All environment variables are listed in output]

```
P00>>> show sys_serial_num ③
sys_serial_num                NI49304561
```

1. Check that the operating system is at the minimum revision for the new AlphaServer 4000/4100 system.
2. Shut down the operating system and issue the console commands **show configuration** (❶) and **show *** (❷) to show the system configuration and environment variables. The system serial number is saved on the motherboard NVRAM, **not** the ESC NVRAM or the TOY NVRAM. Issue a **show sys_serial_num** (❸) to obtain the system serial number. Keep a hard copy of the output for reference at the end of this upgrade procedure.

1.2 Save Information to Diskette

To transfer environment variable (EV) settings and ECU data, copy the information to a diskette. You will then restore this information after the new system drawer is installed.

NOTE: You must type the commands exactly as they appear in Example 1-2.

Example 1-2 Saving Information to Diskette

```
P00>>> show dev floppy ❶
polling floppy0 (FLOPPY) PCEB - XBUS hose 0
dva0.0.0.1000.0      DVA0                                RX23
P00>>> chmod +w dva0.0.0.1000.0 ❷
P00>>> cat eerom >pmem:800000 ❸
P00>>> cat toy >pmem:802000 ❹
P00>>> cat pmem:800000 -l 2200 >dva0.0.0.1000.0 ❺
P00>>> hd buf/dva0 ❻
block 0
00127860  93 19 20 06 01 04 0E 00 1E 00 AE 00 FC 0B 03 00
00127870  00 00 01 00 00 00 FF FF FF FF 00 00 00 00 00
00127880  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
P00>>> ^C
P00>>>
```

- ❶ Insert a new diskette into the system drawer diskette drive. Enter the command **show device floppy** to initialize the console diskette driver.
- ❷ Enter this command to make the diskette writable.
- ❸ The command **cat erom >pmem:800000** saves the EV settings and ECU data stored in ESC NVRAM to memory.
- ❹ Issue this command to save the TOY NVRAM EV settings and ECU data to memory.
- ❺ Copy the memory contents to the diskette.
- ❻ Enter this command to check if the data has been copied. You can stop the output by issuing **^C**.

Chapter 2

Installing the Upgrade

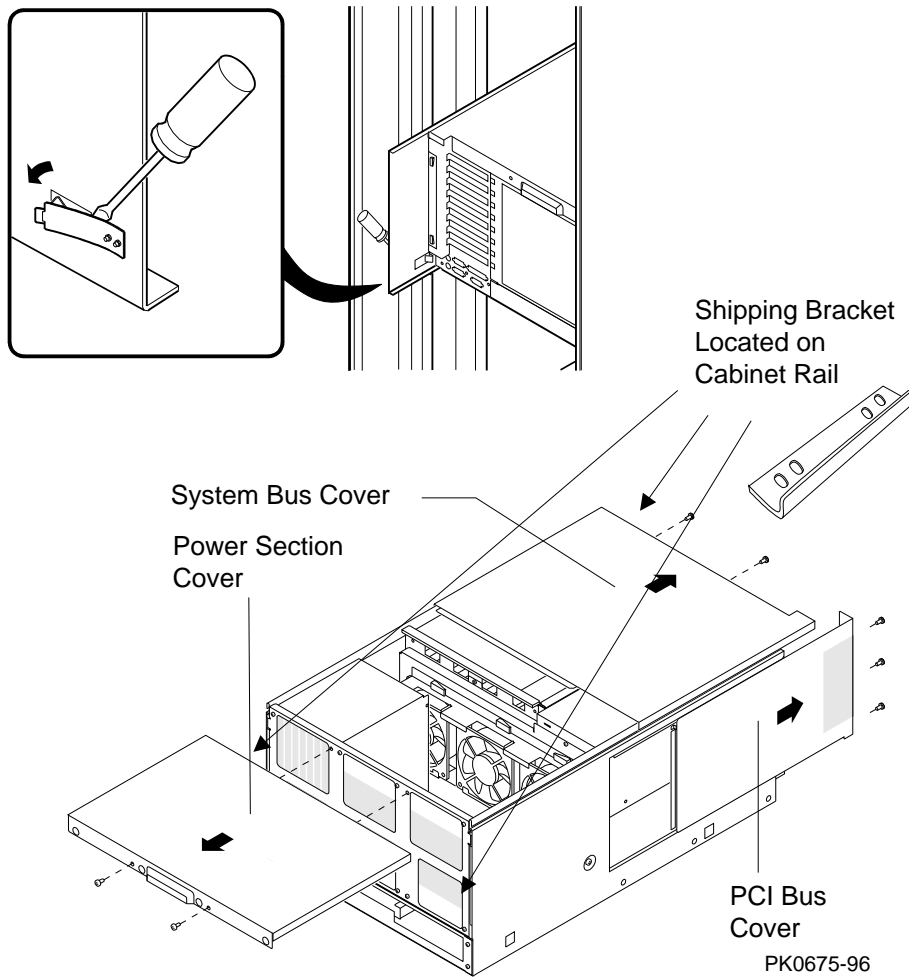
There are several upgrades in the AlphaServer 4000/4100 family that involve exchanging the system drawers. This chapter describes the procedure for installing the new system drawer in a cabinet or pedestal. Sections include:

- Remove Old System Drawer (Cabinet)
- Remove Old System Drawer (Pedestal)
- Transfer I/O Option Cards
- Transfer CPU and Memory Cards
- Install New System Drawer (Cabinet)
- Install New System Drawer (Pedestal)

2.1 Remove Old System Drawer (Cabinet)

First, power down the system. Then, open both cabinet doors, disconnect cables that obstruct the movement of the drawer, remove the shipping brackets, and slide the drawer out of the cabinet.

Figure 2-1 Removing the System Drawer (Cabinet)



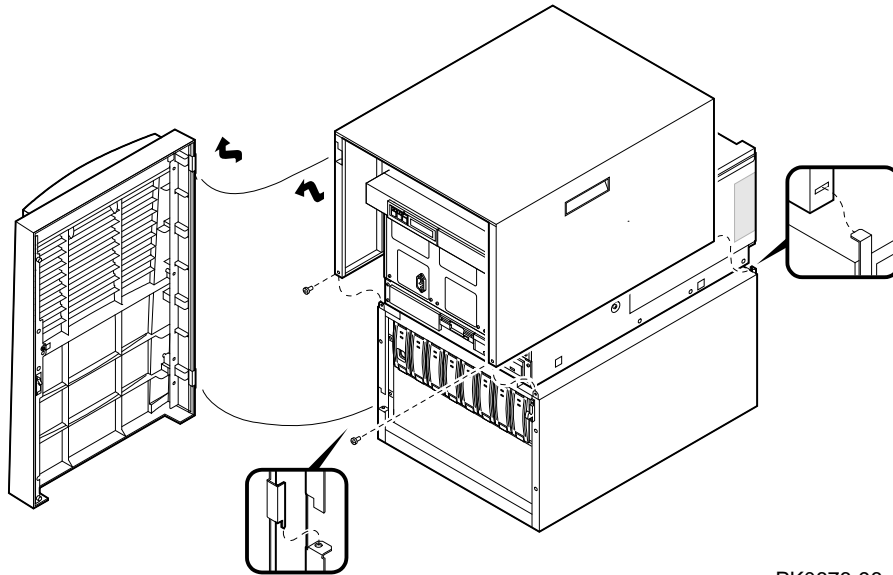
WARNING: The system drawer, fully configured, weighs 45 kg (100 lbs). Two people are required to remove and install a system drawer in the cabinet.

1. At the front of the cabinet, unplug the drawer's power supplies.
2. Remove the two shipping brackets by removing the four Phillips screws (see Figure 2-1).
3. At the rear, remove the shipping bracket on the right rail so that the drawer can be pulled out.
4. Using a flathead screwdriver, disengage the interlock mechanism at the lower left-hand corner of the drawer.
5. Leaving the screwdriver in place, slowly slide the drawer out of the cabinet.
6. Set the drawer on a cleared, flat surface.
7. Remove the system bus cage cover by removing the two Phillips head screws.
8. Remove the I/O card cage cover by removing the three Phillips screws that attach the cover to the drawer. Slide the cover off the drawer.

2.2 Remove Old System Drawer (Pedestal)

First, power down the system. Remove the top cover and front door. Unplug the drawer's power supply(ies). Then, remove the system drawer. You must remove the pedestal tray and install it on the new system drawer.

Figure 2-2 Removing the System Drawer (Pedestal)



PK0676-96

WARNING: *The system drawer, fully configured, weighs 45 kg (100 lbs). Two people are required to remove and install a system drawer in the cabinet.*

1. Open the front door and remove it by lifting and pulling it away from the enclosure.
2. Unplug the system drawer's power supply(ies).
3. Remove the top cover. Unscrew the two Phillips head screws midway up on each side of the pedestal, tilt the cover up, and lift it away from the frame.
4. Remove the four screws that attach the system drawer to the pedestal. (You may have to remove a StorageWorks shelf to access these screws.)

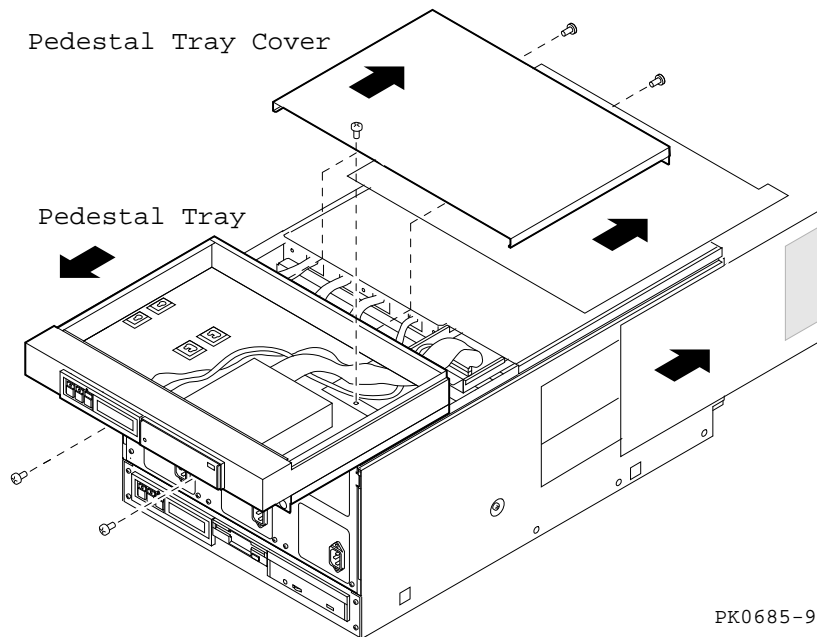
5. Set the drawer on a cleared, flat surface.
6. Remove the system bus cage cover by removing the two Phillips head screws.
7. Remove the I/O card cage cover by removing the three Phillips screws that attach the cover to the drawer. Slide the cover off the drawer.

Removing the Pedestal Tray

1. Remove the tray cover by loosening the screws at the back of the tray.
2. Disconnect the cables from the control panel and any optional SCSI device from the bulkhead connector in the rear right corner of the tray.
3. Unscrew the Phillips head screw holding the bulkhead to the tray.
4. Unscrew the two Phillips head retaining screws and slide the tray off the drawer.

Reverse the above procedure when installing the pedestal tray on the new system drawer.

Figure 2-3 Removing the Pedestal Tray

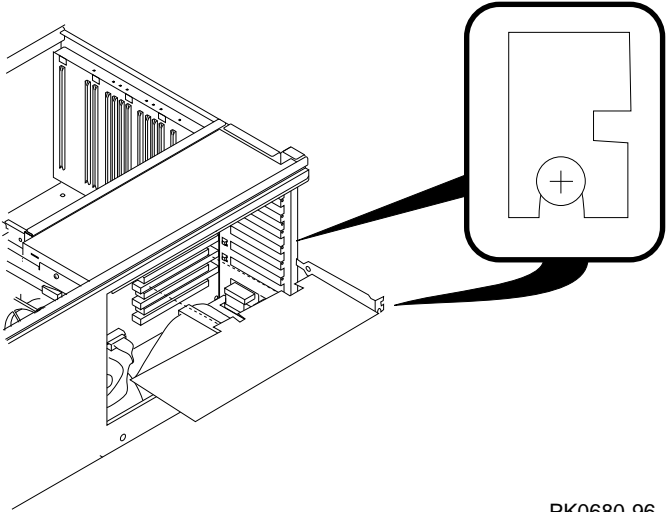


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2.3 Transfer I/O Option Cards

Remove the I/O option cards.

Figure 2-4 Removing an I/O Option Card



PK0680-96

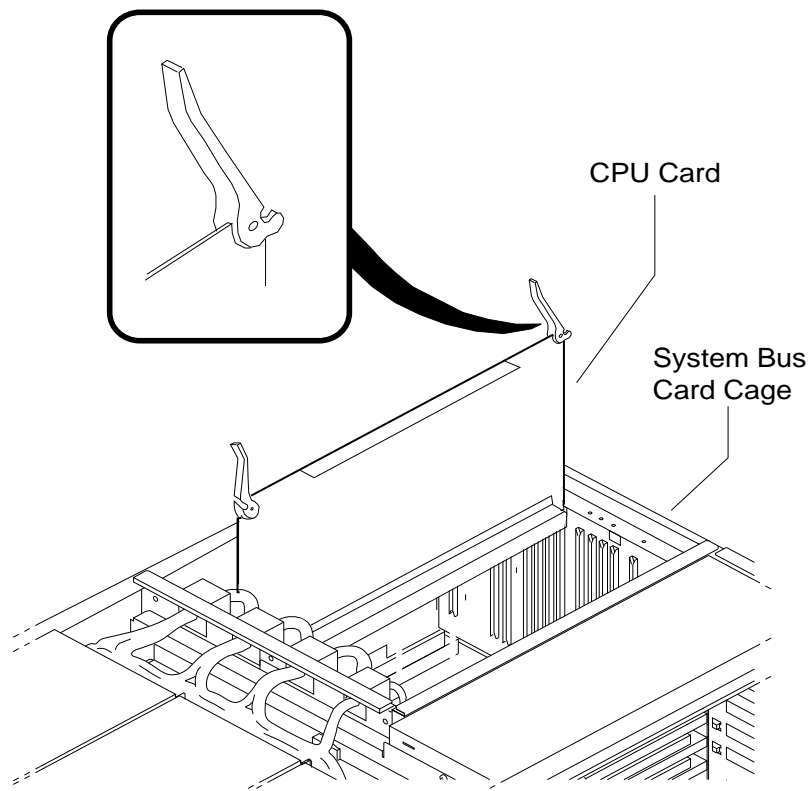
1. Disconnect any cables attached to the I/O card.
2. Remove the Phillips screw that holds the I/O card in place.
3. Slide the I/O card from the card cage.

2.4 Transfer CPU and Memory Cards

Remove the CPU and memory cards from the old system drawer and then install them in the new system drawer.

NOTE: When upgrading to an AlphaServer 4000 system drawer, you can transfer the KN304-AA (B3004-AA), KN304-DA (B3004-DA), and KN302-AB (B3004-BA) CPU cards. DO NOT transfer the KN301-CA (B3001-AA) card or the KN302-AB (B3002-AA) card.

Figure 2-5 Removing a CPU Card



PK0677-96

CAUTION: Wear an antistatic wrist strap when working on this system.

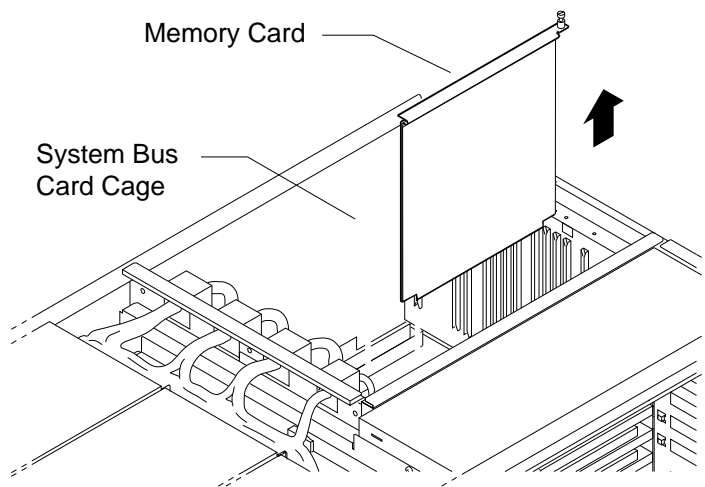
1. Raise the levers on the CPU card.
2. Carefully lift the card out of the card cage.

Reverse these steps when installing the cards in the new system drawer.

NOTE: The first CPU card must occupy slot CPU0.

NOTE: Memory cards must be configured in matched pairs. When large memory pairs are configured with smaller memory pairs, the largest memory cards must be installed in the lowest order slots.

Figure 2-6 Removing a Memory Card



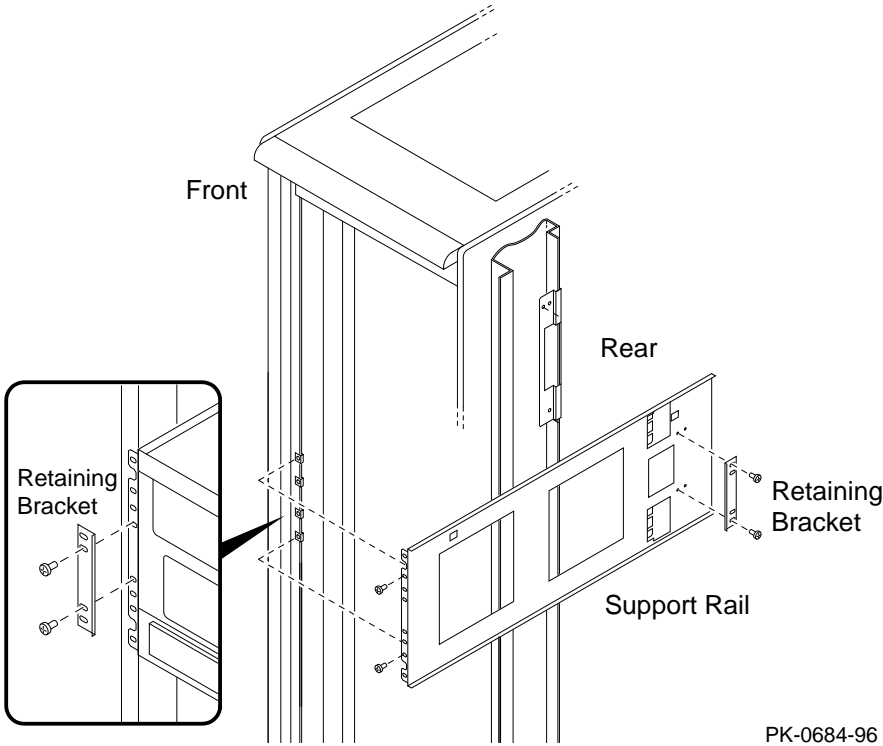
PK0679-96

To remove a memory card, loosen the captive screw on the top brace of the card and lift the card from the cage.

2.5 Install New System Drawer (Cabinet)

You install the new system drawer at the front of the cabinet.

Figure 2-7 System Drawer Retaining Brackets

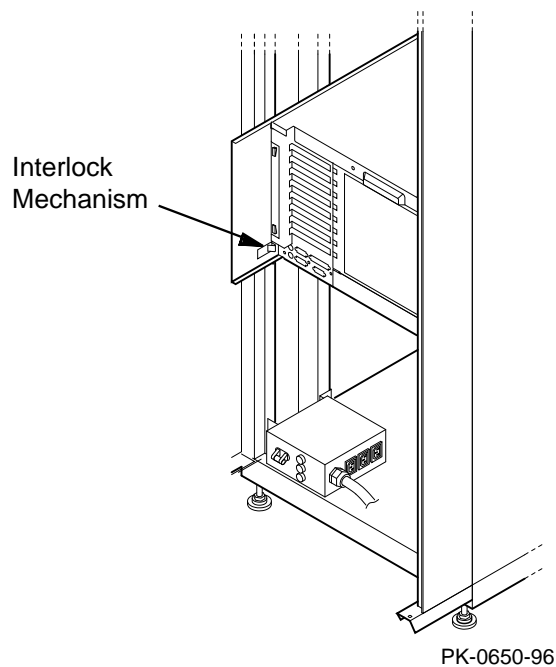


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WARNING: The system drawer, fully configured, weighs 45 kg (100 lbs). Two people are required to install a system drawer in the cabinet.

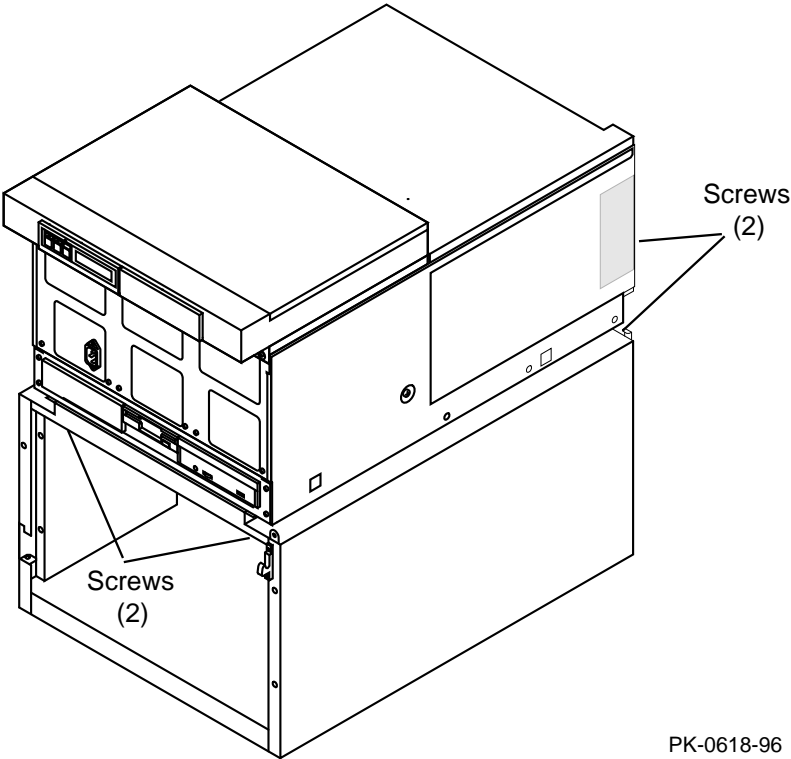
1. Install the new system drawer at the front of the cabinet. Position the system drawer so that the power supply section is located at the front of the cabinet.
2. Carefully slide the system drawer onto the support rails. The interlock mechanism will catch the drawer and hold it in place (see Figure 2–8).
3. Secure the system drawer by fastening the retaining brackets with screws (two brackets at the front of the cabinet and one bracket at the rear of the cabinet). See Figure 2–7.
4. Plug the power cable(s) into the power strip at the bottom of the cabinet and into the front of the system drawer.
5. Tie-wrap the power and signal cables to either the cabinet mounting holes or cable management bracket. Provide strain relief to cable connectors to avoid disconnection during operation.

Figure 2–8 Interlock Mechanism (Rear)



2.6 Install New System Drawer (Pedestal)

Figure 2-9 Installing New System Drawer (Pedestal)



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WARNING: The system drawer, fully configured, weighs 45 kg (100 lbs). Two people are required to install a system drawer in the pedestal.

1. Lift the drawer onto the pedestal base.
2. Attach the drawer to the pedestal by installing the four screws at each corner of the pedestal base (see Figure 2-9).
3. Attach the pedestal tray (see Section 2.2).
4. Attach the top cover by sliding it into the two rear brackets and install the two screws at the front of the pedestal (see Figure 2-2).
5. Plug the power cable(s) into the power strip at the bottom of the cabinet and into the front of the system drawer.
6. Attach the front door.

Chapter 3

Verification

This chapter provides the system drawer verification procedure. See the *AlphaServer 4000 or 4100 System Drawer User's Guide* for more information. Sections include:

- Restore System Information
- Update Firmware

3.1 Restore System Information

After you have installed the new system drawer, turn on the system and check the power-up test. Check the system configuration against the old configuration. Insert the diskette and restore the system environment variable settings and ECU data. Issue the set command to set the system model number and serial number.

NOTE: You must type the commands exactly as they appear in Example 3-1.

Example 3-1 Restoring Environment Variables

```
P00>>> sho dev floppy ❶
polling floppy0 (FLOPPY) PCEB - XBUS hose 0
dva0.0.0.1000.0      DVA0              RX23
P00>>> cat dva0.0.0.1000.0 -l 2200 >pmem:800000 ❷
P00>>> cat pmem:800000 >eeprom ❸
P00>>> cat pmem:802000 >toy ❹
P00>>> show * ❺
auto_action          HALT
boot_dev
boot_file
boot_osflags
boot_reset           OFF

[All environment variables are listed in output]
P00>>> set sys_serial_num NI49304561 ❻
P00>>> set sys_model_num 4100
P00>>> test ❼
```

Press the control panel Halt button to reset the system.

Press the Power button to power up the system. After powering up the system, testing begins and status messages display. Check the test results and system configuration. At the SRM console prompt, restore the EV settings and use the set command to set the system model number and serial number.

- ❶ Insert the diskette into the system drawer diskette drive. Enter the command **show device floppy** to initialize the console diskette driver.
- ❷ Copy the contents of the diskette to memory.
- ❸ Restore the ESC NVRAM contents to memory.
- ❹ Restore the TOY NVRAM contents to memory.
- ❺ Enter a **show *** command to check environment variable settings.
- ❻ Issue the command **set sys_serial_num** to restore the system serial number. Update the model number by entering the **set sys_model_num** command.
- ❼ You may enter the **test** command to verify the system.

3.2 Update Firmware

Use the Loadable Firmware Update (LFU) Utility to update system firmware. In Example 3-2 the user inserts the update CD-ROM, issues the LFU command, and selects cda0 as the load device. In Example 3-3 the user starts LFU by using a boot dka500 command.

Example 3-2 Updating Firmware with LFU Command

```
P00>>> lfu
***** Loadable Firmware Update Utility *****
Select firmware load device (cda0, dva0, ewa0), or
Press <return> to bypass loading and proceed to LFU: cda0 ❶
Please enter the name of the options firmware files list, or
Press <return> to use the default filename [AS4X00FW]: AS4X00CP ❷
Copying AS4X00CP from DKA500.5.0.1.1 .
Copying [as4x00]RHREADME from DKA500.5.0.1.1 .
Copying [as4x00]RHSRMROM from DKA500.5.0.1.1 .....
Copying [as4x00]RHARCROM from DKA500.5.0.1.1 .....
-----
Function      Description  ❸
-----
Display      Displays the system's configuration table.
Exit         Done exit LFU (reset).
List         Lists the device, revision, firmware name, and
            update revision.
Lfu          Restarts LFU.
Readme       Lists important release information.
Update       Replaces current firmware with loadable data image.
Verify       Compares loadable and hardware images.
? or Help    Scrolls this function table.
-----

UPD> list ❹

Device      Current Revision  Filename      Update Revision
AlphaBIOS   V5.12-2          arcrom        V5.24-0
srmflash    V1.2-4           srmrom        V3.0-10
```

Continued on next page

- ❶ Select the device from which firmware will be loaded. The choices are the internal CD-ROM, the internal floppy disk, or a network device. In this example, the internal CD-ROM is selected.
- ❷ Select the file that has the firmware update, or press Enter to select the default file. The file options are:

AS4X00FW (default)	SRM console, AlphaBIOS console, and I/O adapter firmware.
AS4X00CP	SRM console and AlphaBIOS console firmware only.
AS4X00IO	I/O adapter firmware only.

In this example the file for console firmware (AlphaBIOS and SRM) is selected.
- ❸ The LFU function table and prompt (UPD>) display.
- ❹ Use the LFU **list** command to determine the revision of firmware in a device and the most recent revision of that firmware available in the selected file. In this example, the resident firmware for each console (SRM and AlphaBIOS) is at an earlier revision than the firmware in the update file.

Continued on next page

Example 3-2 Updating Firmware with LFU Command (Continued)

```
UPD> update * 5  
WARNING: updates may take several minutes to complete for each  
device.  
Confirm update on: AlphaBIOS [Y/(N)] y 6  
DO NOT ABORT!  
AlphaBIOS Updating to V5.24-0... Verifying V5.24-0... PASSED.  
  
Confirm update on: srmflash [Y/(N)] y  
  
DO NOT ABORT!  
srmflash Updating to V3.0-10... Verifying V3.0-10..PASSED.  
  
UPD> exit 7
```


- ⑤ The **update** command updates the device specified or all devices. In this example, the wildcard indicates that all devices supported by the selected update file will be updated.
- ⑥ For each device, you are asked to confirm that you want to update the firmware. The default is no. Once the update begins, do not abort the operation. Doing so will corrupt the firmware on the module.
- ⑦ The **exit** command returns you to the console from which you entered LFU (either SRM or AlphaBIOS).

Example 3-3 Updating Firmware Using Boot DKA500 Command

```
P00>>> b dka500❶
(boot dka500.5.0.1.1)
Building FRU table
bootstrap code read in
base = 200000, image_start = 0, image_bytes = 16d400
initializing HWRPB at 2000
initializing page table at 1f2000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code

Starting Firmware Update Utility❷
***** Loadable Firmware Update Utility *****
-----
Function      Description
-----
Display      Displays the system's configuration table.
Exit         Done exit LFU (reset).
List         Lists the device, revision, firmware name, and
             update revision.
Lfu          Restarts LFU.
Readme       Lists important release information.
Update       Replaces current firmware with loadable data
             image.
Verify       Compares loadable and hardware images.
? or Help    Scrolls this function table.
-----

UPD>
```

In Example 3-3 the user inserts the firmware update CD-ROM, and then enters the command **b dka500** (❶) to start LFU (❷).

Index

A

AlphaBIOS console, 3-5

C

CPU cards, 2-8

Configuration rules, 2-9

D

Diskette

restoring information from, 3-2

saving information to, 1-4

E

ECU data, 1-4, 3-2

Environment variables, 1-2, 3-2

ESC NVRAM, 1-3, 3-3

I

I/O adapter firmware, 3-5

I/O card cage, 2-5

Interlock mechanism, 2-11

L

Loadable Firmware Update (LFU)

Utility, 3-4

M

Memory cards, 2-8

P

Pedestal tray, 2-5

S

Serial number, 1-2

Shipping brackets, 2-2

SRM console, 3-5

T

TOY NVRAM, 1-3, 3-3

