2T-4100R AlphaServer 4100 RM Slide Shelf Assembly

Installation Guide

Order Number: EK-4100R-IN. A01

January 1997

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S3357

This document was prepared using VAX DOCUMENT Version 2.1.

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Preface

Overview

This guide provides the information necessary to install the 2T-4100R AlphaServer 4100 RM slide shelf assembly in a 48.26-cm (19-in.) English RETMA cabinet. This guide *does not* provide information concerning other systems that can be installed in the cabinet. For information concerning other systems that can be installed in the cabinet, refer to the respective documentation shipped with the system.

Intended Audience

The instructions in this guide are for Digital Customer Services representatives and customer maintenance personnel who are familiar with computer hardware and operating systems. Personnel should be experienced and trained in installing computer and related equipment.

How to Use This Guide

Read all of this guide *before* installing the 2T-4100R AlphaServer 4100 RM slide shelf assembly.

Before installation review the warranty. The terms of the warranty agreement with Digital may require that a qualified Digital Customer Services representative install the system. Contact your local Digital representative if you have any questions.

Organization

This guide is organized as follows:

Chapter 1, Introduction – Provides an overview of the 2T-4100R AlphaServer 4100 RM slide shelf assembly.

Chapter 2, Installation – Provides site preparation, unpacking, and installation information.

Reader's Comments

Digital welcomes your comments on this or any other manual. You can send your comments to Digital in the following ways:

- Internet electronic mail: readers_comment@zk3.dec.com
- Mail:

Digital Equipment Corporation Shared Engineering Services PKO3-2/A9 129 Parker Street Maynard, MA 01754-2199

For additional information, call 1-800-DIGITAL.

Related Documents

For additional information on the AlphaServer 4100 RM system, refer to the documentation listed in the following table.

Site Environmental Preparation Guide	EK-CSEPG-MA
AlphaServer 4100 System Drawer User's Guide	EK-4100A-UG
AlphaServer 4100 Configuration and Installation Guide	EK-4100A-CG
AlphaServer 4100 Service Manual (hardcopy)	EK-4100A-SV
AlphaServer 4100 Service Manual (diskette)	AK-QXBJA-CA
KN30n CPU Installation Card	EK-KN300-IN
MS3n0 Memory Installation Card	EK-MS300-IN
H7291 Power Supply Installation Card	EK-H7291-IN
Serverworks Manager Administrator User's Guide	ER-4QXAA-UA

Conventions

This guide uses the following conventions:

Convention	Meaning
Note	A note calls the reader's attention to any item of information that may be of special importance.
Caution	A caution contains information essential to avoid damage to the equipment.
Warning	A warning contains information essential to the safety of personnel.

Introduction

1.1 Description

The rackmounted 2T-4100R AlphaServer 4100 RM slide shelf assembly is designed for installation in 48.26-cm (19-in.) English RETMA cabinets. The slide shelf assembly is available in three option variations:

- 2T-4100R-AA—For cabinets with a front door (does not include a front bezel)
- 2T-4100R-BA—For gray cabinets without a front door (includes a gray front bezel)
- 2T-4100R-CA—For blue cabinets without a front door (includes a blue front bezel)

The slide shelf assembly allows an AlphaServer 4100 RM system to be fully extended from the front of the cabinet for easy access during service or maintenance operations.

The slide shelf assembly contains the following major components:

- A slide-mounted shelf that the AlphaServer 4100 RM system is mounted on so that it can be extended for access during service or maintenance operations.
- A cabinet cable management bracket.
- A cabinet interlock actuator, a stabilizer bracket, and actuator latch.

Installation

2.1 Introduction

This chapter discusses the installation of the 2T-4100R-AA/BA/ED slide shelf assembly. The major topics covered in this chapter include:

- Site Preparation
- Unpacking the Shipment
- Installing the Slide Shelf Assembly
- Installing the Cabinet Cable Management Bracket
- Installing the Interlock Actuator, Stabilizer Bracket and Latch
- Connecting and Routing Power Cords
- Installing the Optional Air Plenum

2.2 Site Preparation

The cabinet that the 2T-4100R slide shelf assembly is to be installed in should be located in an area that provides sufficient clearance for ventilation and servicing. A clearance of 91.44 cm (36.0 in.) at both the front and rear of the cabinet is required for service.

Caution
Do not impede airflow by obstructing the front and rear of the cabinet. Exceeding internal thermal limits can affect equipment reliability.

2.3 Unpacking the Shipment

The 2T-4100R slide shelf assembly shipment may include several cartons. Check the packing list to ensure that all items listed have been received.

If the equipment is damaged or if any items are missing, notify the delivery agent and contact the Digital sales representative.

Save all shipping cartons in case the equipment needs to be moved to a new location, or needs to be returned for repair.

Table 2–1 lists the mounting hardware and components included with the slide shelf assembly shipment for installation in English RETMA cabinets.

Table 2-1 Slide Shelf Assembly Shipment Contents

Description	Part Number	Quantity
Cabinet cable management bracket	74-51851-01	1
Slide assembly	12-41429-01	1 pair
LH front slide bracket (pre-assembled)	74-51752-01	1
RH front slide bracket (pre-assembled)	74-51752-02	1
LH rear slide bracket (pre-assembled)	74-51753-01	1
RH rear slide bracket (pre-assembled)	74-51753-02	1
Slide tray	74-51751-01	1
Nut plate	74-51756-01	4
Front bezel (gray for 2T-4100R-BA only)	70-33068-01	1
Front bezel (blue for 2T-4100R-CA only)	70-33068-02	1
Power cord	17-00083-51	3
Latch bracket (2T-4100R-BA/CA only)	74-51754-01	2
RH catch bracket	74-51757-01	1
LH catch bracket	74-51757-02	1
Air plenum (optional for 2T-4100R-SD)	74-51758-01	1
Air plenum (optional for 2T-4100R-ED)	74-51758-02	1
Interlock actuator	74-51759-01	1
Stabilizer bracket	74-48996-01	1

(continued on next page)

Table 2–1 (Cont.) Slide Shelf Assembly Shipment Contents

Description	Part Number	Quantity
Actuator latch	74-48997-02	1
10-32 shoulder screw	12-24007-02	4
8-32 truss-head screw	90-00063-24	9
10-32 truss-head screw	90-00063-39	28 for 2T-4100R-BA/CA 24 for 2T-4100R-AA
6-32 set screw	90-06291-10	2
8-32 kepnut	90-06563-00	8
Lock washer	90-06637-00	4
Cable clamp	90-07082-00	18
10-32 U-nut	90-07786-01	8 for 2T-4100R-BA/CA 4 for 2T-4100R-AA
M4 x 10 mm pan-head screw	90-40146-04	4
Flat washer	90-06660-00	27
Helical split washer	90-06690-00	10
8-32 hexnut	90-06561-00	10
8-32 x .437 pan-head machine screw	90-06038-01	10
8-32 x .375 pan-head machine screw	90-06037-01	10
2T-4100R AlphaServer 4100 RM Slide Shelf Assembly Installation Guide	EK-4100R-IN	1

2.4 Installing the Slide Tray

The following sections contain the procedure for installing the slide tray portion of the slide shelf assembly in a 48.26-cm (19-in.) English RETMA cabinet.

Tools Required

- Phillips-head screwdriver
- Flat-blade screwdriver
- Adjustable wrench

2.4.1 Determining the Installation Area

The slide shelf assembly requires 35.6 cm (14.0 in.) of vertical space or 24 contiguous holes in a 48.26-cm (19-in.) English RETMA cabinet.

The holes in English RETMA cabinet rails follow a pattern of $1.27~\rm cm$ ($0.50~\rm in.$), $1.59~\rm cm$ ($0.625~\rm in.$), and $1.59~\rm cm$ ($0.625~\rm in.$). This pattern is called a *set* and is repeated for the length of the cabinet rails.

To determine the installation area, perform the following steps at the front of the front rails and the rear of the rear rails (refer to Figure 2–1).

1. If the slide shelf assembly is being installed below existing equipment in the cabinet, measure down 35.6 cm (14.0 in.) from the bottom of the existing equipment and make a mark between the first set of holes below this point that are 1.27 cm (0.50 in.) apart. This is the *starting point* of the installation area. The first hole above this mark is identified as hole 1 of the installation area.

If the slide shelf assembly is being installed above existing equipment in the cabinet, make a mark between the first set of holes above the existing equipment that are 1.27 cm (0.50 in.) apart. This is the *starting point* of the installation area. The first hole above this mark is identified as hole 1 of the installation area.

- 2. Count up 24 holes from the starting point and make a mark between the 24th and 25th holes. The area between these two marks is the *installation area*.
- 3. Repeat steps 1 and 2 on the front of both front rails and the rear of both rear rails

The total installation area for the slide shelf assembly is 35.6 cm (14.0 in.) of vertical space. The equation for calculating the total installation area is:

```
4.45 \text{ cm} (1.75 \text{ in.}) \times 8 \text{ sets} = 35.6 \text{ cm} (14.0 \text{ in.})
```

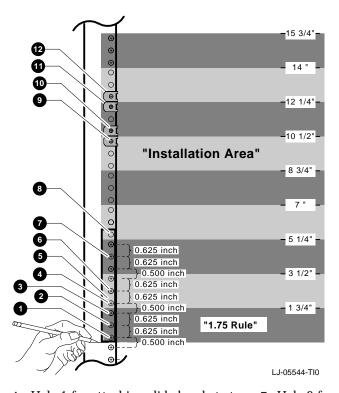


Figure 2-1 Installation Area and Rail-Hole Pattern

- 1 Hole 1 for attaching slide brackets to front and rear rails.
- **2** Hole 2 for attaching slide brackets to front and rear rails.
- **3** Hole 3 for attaching slide brackets to front and rear rails.
- 4 Hole 4 for attaching slide brackets to front and rear rails.
- 5 Nut plate (placed behind front and rear rails).
- **6** Hole 6 for securing catch bracket to front rails and for securing stabilizer bracket to left rear rail.

- 7 Hole 9 for securing stabilizer bracket to left rear rail.
- **8** Hole 11 for securing catch bracket to front rails and nut plate to rear rails.
- **9** Hole 19 for U-nut used to secure cabinet cable management bracket to rear rails.
- $10\,$ Hole 20 for U-nut used to secure latch bracket to front rails.
- 11 Hole 22 for U-nut used to secure cabinet cable management bracket to rear rails.
- 12 Hole 23 for U-nut used to secure latch bracket to front rails.

2.4.2 Attaching the Slide Assemblies to the Cabinet Rails

The slide assemblies are shipped with the front and rear slide brackets already attached.

To attach the slide assemblies to the cabinet rails, refer to Figure 2–2 and proceed as follows:

- 1. Determine the proper mounting holes for the slide brackets.

 The proper mounting holes are the 1st, 2nd, 3rd, and 4th holes of the installation area (see Figure 2–1).
- 2. Loosen, but do not remove, the three screws and nuts 1 that secure the rear slide brackets to the slide assemblies. This allows the length of the slide assemblies to be adjusted between the front and rear rails.
- 3. Locate the right slide assembly.
- 4. Place the front slide bracket on the inside of the right front rail and align the 1st, 2nd, 3rd, and 4th holes from the bottom of a nut plate 2 with the four slide bracket holes and with the 1st, 2nd, 3rd, and 4th holes of the installation area on the right front rail.

Note					
If the 1st, 2nd, 3rd, and 4th holes from the bottom of a nut plate do not					
properly align with the slide bracket holes and the right front rail holes,					
turn the nut plate unsidedown and check the alignment					

- 5. Install one 10-32 shoulder screw 3 with a lock washer 4 in the 1st hole of the installation area to secure the front slide bracket to the right front rail, but $do\ not$ tighten.
- 6. Install three 10-32 truss-head screws 5 in the 2nd, 3rd, and 4th holes of the installation area to secure the front slide bracket and nut plate to the right front rail, but *do not* tighten.
- 7. Place the rear slide bracket on the inside of the right rear rail and align the 1st, 2nd, 3rd, and 4th holes from the bottom of a nut plate 2 with the four slide bracket holes and with the 1st, 2nd, 3rd, and 4th holes of the installation area on the right rear rail.

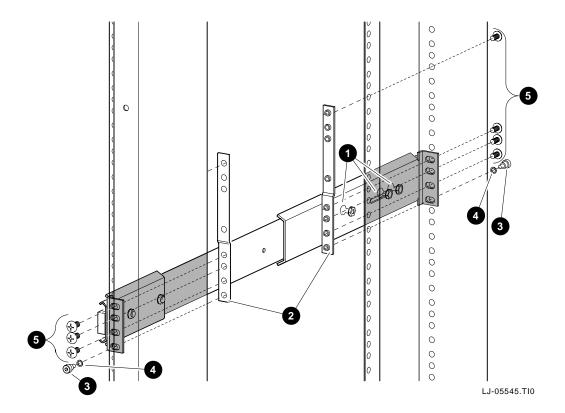
Note	
If the 1st, 2nd, 3rd, and 4th holes from the bottom of a nut r	olate do not

If the 1st, 2nd, 3rd, and 4th holes from the bottom of a nut plate do not properly align with the slide bracket holes and the right rear rail holes, turn the nut plate upsidedown and check the alignment.

- 8. Install one 10-32 shoulder screw 3 with a lock washer 4 in the 1st hole of the installation area to secure the rear slide bracket to the right rear rail, but *do not* tighten.
- 9. Install four 10-32 truss-head screws 5 in the 2nd, 3rd, 4th, and 11th holes of the installation area to secure the rear slide bracket and nut plate to the right rear rail, but *do not* tighten.
- 10. Tighten the three 8-32 pan-head machine screws and 8-32 hexnuts 1 that secure the right rear slide bracket to the right slide assembly.

- 11. Locate the left slide assembly.
- 12. Repeat steps 4 through 10 to attach the left slide assembly to the left front and rear rails.
- 13. Tighten the 10-32 shoulder screws and 10-32 truss-head screws on the front and rear cabinet rails only enough to allow play for the slides to self-align when the slide tray is installed in the cabinet.

Figure 2-2 Attaching the Slide Assemblies to the Cabinet Rails



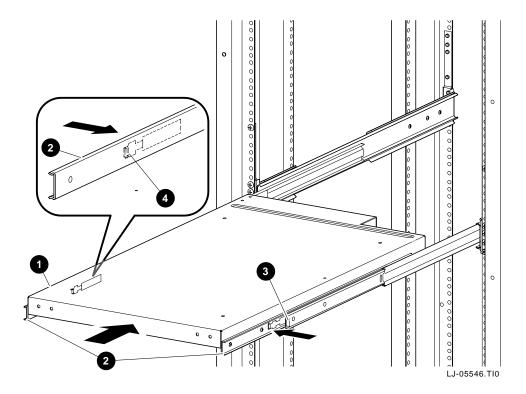
2.4.3 Mounting the Slide Tray on the Slides

The slide tray is shipped with the inner races from the left and right slide assemblies already attached.

To mount the slide tray on the slides, refer to Figure 2–3 and proceed as follows:

- 1. Fully extend the slides, then lift the slide tray 1 and position it so that the inner races 2 fit into the front end 3 of the slides (see Figure 2–3).
- 2. Push the slide tray into the slides until it stops. Push in on the two locking levers 4 if necessary and then push the slide tray into the cabinet (see Figure 2–3).
- 3. Ensure that the slide tray slides smoothly in and out of the cabinet.
- 4. Tighten the one 10-32 shoulder screw and four 10-32 truss-head screws that secure each of the rear slide brackets and nut plates to the rear rails.
- 5. Tighten the one 10-32 shoulder screw and three 10-32 truss-head screws that secure each of the front slide brackets and nut plates to the front rails.

Figure 2–3 Mounting the Slide Tray on the Slides



2.4.4 Mounting the AlphaServer 4100 Chassis on the Slide Tray

To mount the AlphaServer 4100 chassis on the slide tray, refer to Figure 2-4 and proceed as follows:

1. Extend the slide tray to its fully extended position. The slide locking levers

	Warning
tray, ensure that the ca	ount the AlphaServer 4100 chassis on the slide binet is stable and that all provided stabilizing vated. The stabilizing features for the rack or n dependent.
	Warning

- 2. Lift the AlphaServer 4100 RM chassis until it is just above the slide tray, and then move the chassis back and onto the slide tray.
- 3. Carefully position the chassis until the four mounting holes in the bottom of the chassis line up with the four mounting holes in the bottom of the slide tray.
- 4. Secure the chassis to the slide tray by installing four M4 x 10mm pan-head screws 1, flat washers 2, and cable clamps 3. Two cable clamps go on each screw under the left side of the slide tray and one cable clamp goes on each screw under the right side of the slide tray.
- 5. Install cable clamps 4 on the two studs located underneath the slide tray on the left and right sides using flat washers 5 and 8-32 kepnuts 6. Two cable clamps go on the left stud and one cable clamp goes on the right stud.

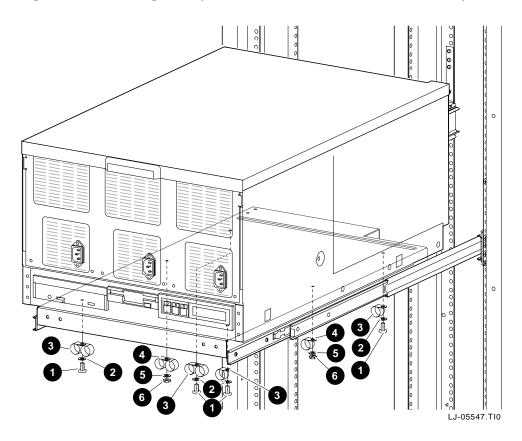


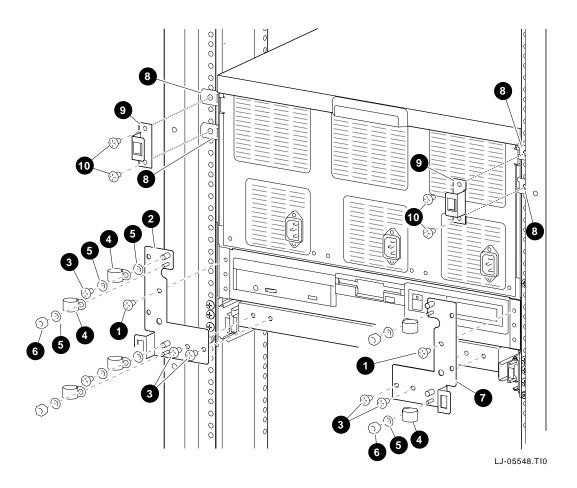
Figure 2-4 Mounting the AlphaServer 4100 Chassis on the Slide Tray

2.4.5 Attaching the Catch and Latch Brackets

To attach the left and right catch brackets to the front of the slide tray and AlphaServer 4100 chassis and the latch brackets to the front rails, refer to Figure 2–5 and proceed as follows:

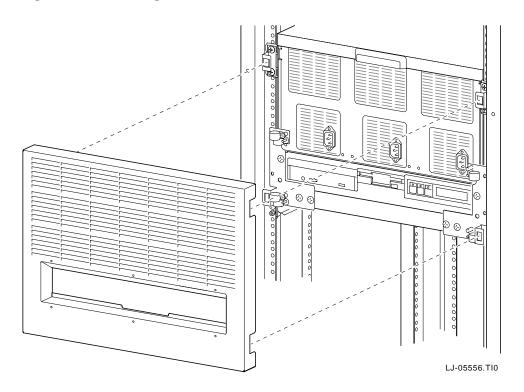
- Remove the top screw 1 on the left and right side of the AlphaServer 4100 control panel assembly. Save these two screws for securing the left and right catch brackets to the AlphaServer 4100 chassis.
- 2. Align the two holes at the bottom of the left catch bracket 2 with the two holes in the left front edge of the slide tray.
- 3. Secure the left catch bracket 2 to the slide tray with two 8-32 truss-head screws 3.
- 4. Secure the left catch bracket 2 to the AlphaServer 4100 chassis by replacing the screw 1 that was removed from the top left side of the AlphaServer 4100 control panel assembly in step 1.
- 5. Attach a cable clamp 4 to each of the studs (one at the top and one at the bottom) on the left catch bracket with flat washers 5 and 8-32 kepnuts 6.
- 6. Attach a cable clamp 4 to each of the standoffs (one at the top and one at the bottom) on the left catch bracket with flat washers 5 and 8-32 truss-head screws 3.
- 7. Align the two holes at the bottom of the right catch bracket 7 with the two holes in the right front edge of the slide tray.
- 8. Secure the right catch bracket 7 to the slide tray with two 8-32 truss-head screws 3.
- 9. Secure the right catch bracket 7 to the AlphaServer 4100 chassis by replacing the screw 1 that was removed from the top right side of the AlphaServer 4100 control panel assembly in step 1.
- 10. Attach a cable clamp 4 to each of the studs (one at the top and one at the bottom) on the right catch bracket with flat washers 5 and 8-32 kepnuts 6.
- 11. If the 2T-4100R-BA/CA option is being installed, use the following steps to install the latch brackets to the front rails.
 - a. Locate the 20th and 23rd holes of the installation area on the front rails (see Figure 2–1).
 - b. Install a 10-32 U-nut 8 over the 20th and 23rd holes of the installation area on the front rails by sliding the U-nut over the edge of the cabinet rail and aligning it with the hole (see Figure 2-1). Ensure that the threaded half of the U-nuts are toward the inside of the cabinet.
 - c. Align the latch brackets 9 with the 20th and 23rd holes of the installation area on the front rails, and secure the latch brackets to the front rails by installing two 10-32 truss-head screws 10 in the 20th and 23rd holes on each front rail.

Figure 2–5 Attaching the Catch and Latch Brackets



If the 2T-4100R-BA/CA option is installed, the front bezel can be attached by sliding the slide tray into the cabinet, securing it to the front rails with two 10-32 truss-head screws in the 6th and 11th holes of the installation area on both front rails, aligning the four strikes on the front bezel with the catch and latch brackets, and pressing the front bezel until the four strikes snap into the four latches (see Figure 2–6).





2.5 Installing the Cabinet Cable Management Bracket and Cable Clamps

To install the cabinet cable management bracket to the rear rails of the cabinet and three cable clamps to the rear of the slide tray, refer to Figure 2-7 and proceed as follows:

- 1. Locate the 19th and 22nd holes of the installation area on the rear rails (see Figure 2–1).
- 2. Install a 10-32 U-nut over the 19th and 22nd holes of the installation area on the rear rails by sliding the U-nut over the edge of the cabinet rail and aligning it with the hole (see Figure 2–1). Ensure that the threaded half of the U-nuts are toward the inside of the cabinet.
- 3. Align the cabinet cable management bracket 1 with the 19th and 22nd holes of the installation area on the rear rails, and secure the cabinet cable management bracket to the rear rails by installing two 10-32 truss-head screws 2 in the 19th and 22nd holes on each rear rail.
- 4. Secure the three cable clamps 3 to the rear edge of the slide tray with 8-32 truss-head screws 4 and flat washers 5.

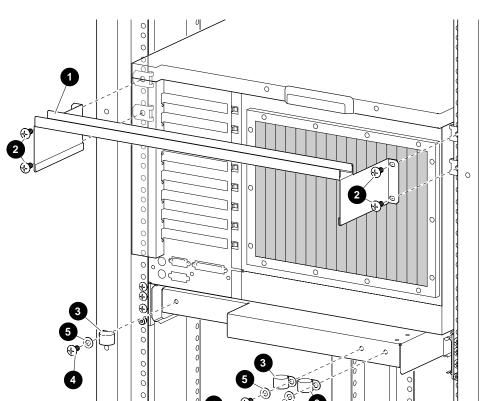


Figure 2–7 Installing the Cabinet Cable Management Bracket and Cable Clamps

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2.6 Installing the Interlock Actuator, Stabilizer Bracket, and **Actuator Latch**

The interlock system helps prevent cabinet instability by allowing only one system at a time to be pulled out of the cabinet.

The interlock system consists of a vertical bar on which are mounted actuator latches for each product installed in the cabinet. These actuator latches engage the interlock actuator on the rear of rackmount systems. When a rackmount system is pulled out of the cabinet, the actuator latches rotate to prevent any other rackmounted system that has an interlock actuator from being pulled out of the cabinet.

To install the interlock actuator, the stabilizer bracket, and the actuator latch, refer to Figure 2-8 and Figure 2-9 and proceed as follows:

1. Mount the interlock actuator 1 on the left rear of the slide tray using two 8-32 kepnuts 2 (see Figure 2-8).

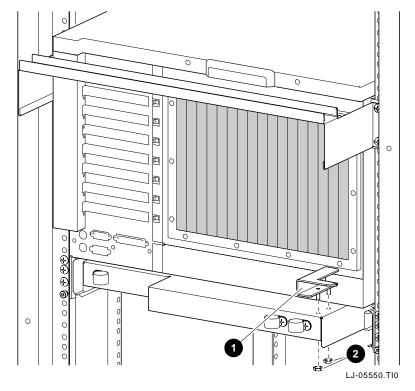


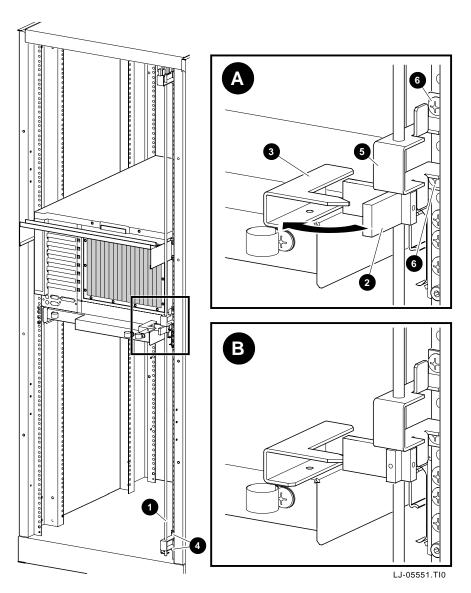
Figure 2-8 Installing the Interlock Actuator

- Remove the screws securing the bottom mounting bracket to the cabinet 4 (see Figure 2-9).
- 3. Slide the mounting bracket off the bottom of the vertical bar 1 .
- 4. Slide the stabilizer bracket 5 for the product onto the bottom of the vertical bar.
- 5. Slide the actuator latch 2 for the product onto the bottom of the vertical bar.
- 6. Replace the bottom mounting bracket 4 and install the screws removed in step 2 but do not tighten them.

- 7. Position the stabilizer bracket 5 so that the mounting holes align with the 6th and 9th holes of the installation area on the left rear rail.
- 8. Secure the stabilizer bracket to the left rear rail with two 10-32 truss-head screws 6 .
- 9. Position the new actuator latch 2 to properly engage the interlock actuator 3, and tighten the two 6-32 set screws to secure the latch to the vertical bar.
- 10. Now tighten the screws to secure the bottom mounting bracket 4 .

In Figure 2–9, the expanded view (A) shows the position of the actuator latches when all systems are pushed into the cabinet. The expanded view (B) shows the position of all actuator latches after one system has been pulled out.

Figure 2-9 Installing the Stabilizer Bracket and Actuator Latch



2.7 Connecting and Routing Power Cords

The AlphaServer 4100 RM system can contain from one to three power supplies. The power cord(s) that come with the AlphaServer 4100 RM system *must* be replaced with the 4.5 m (14.8 ft) power cord(s) that are shipped with the 2T-4100R-AA/BA/ED slide shelf assembly to allow the AlphaServer 4100 chassis to be extended from the cabinet on the slide tray.

Refer to Figure 2–10 and the following procedure for connecting the power cord(s) to the AlphaServer 4100 power supplies and routing the power cord(s) to the cabinet cable management bracket.

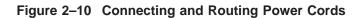
1. Fu	ully e	extend	the	slide	tray	from	the	cabinet.	
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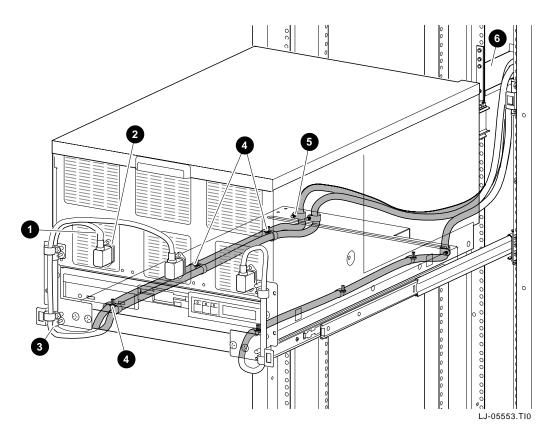
2.	Connect one end of the power cord(s) 1	to the ac input receptacle(s) 2	on the
	front of the AlphaServer 4100 chassis.		

Note					
To route the power cord(s) through the cable clamps, the cable clamps					
have to be removed, the power cord(s) have to be inserted in the clamps,					
and then the cable clamps have to be reinstalled.					

- 3. If the AlphaServer 4100 has one power supply (mounted at the left front of the chassis), route its power cord through the inside cable clamps 3 on the left catch bracket.
 - If the AlphaServer 4100 has a second power supply (mounted at the center front of the chassis), route its power cord through the outside cable clamps on the left catch bracket.
- 4. Route these power cords through the six cable clamps 4 (each power cord goes through three clamps) underneath the left side of the slide tray.
- 5. Route these power cords through the two cable clamps 5 on the left rear edge of the slide tray.
- 6. Route these power cords to the cabinet cable management bracket 6 and secure them to the bracket using cable tie wraps.
 - Ensure that there is enough slack in the power cords to prevent stress (pulling) where the power cords are attached to the slide tray cable clamp and the cabinet cable management bracket.
- 7. If the AlphaServer 4100 has a third power supply (mounted at the right front of the chassis), route its power cord through the cable clamps on the right catch bracket.
- 8. Route this power cord through the three cable clamps underneath the right side of the slide tray.
- 9. Route this power cord through the cable clamp on the right rear edge of the slide tray.
- 10. Route this power cord to the cabinet cable management bracket and secure it to the bracket using a cable tie wrap.

Ensure that there is enough slack in the power cord to prevent stress (pulling) where the power cord is attached to the slide tray cable clamp and the cabinet cable management bracket.





2.8 Installing the Optional Air Plenum

The optional air plenum is installed on the rear of the AlphaServer 4100 chassis to move the cool air flow intake point to the louvered rear door of the cabinet. The optional air plenum is needed when the AlphaServer 4100 system is mounted in a cabinet with other systems (ie. AlphaServer 1000 or AlphaServer 2100 systems) whose cool air flow is from front to rear. The air plenum minimizes the recirculation of exhaust air between the different systems.

The air plenum is available in two variations:

- 2T-4100R-SD for standard depth cabinets
- 2T-4100R-ED for extended depth cabinets

To install the air plenum on the rear of the AlphaServer 4100 chassis, refer to Figure 2–11 and proceed as follows:

- 1. Slide the slide tray into the cabinet and secure it to the front rails by installing two 10-32 truss-head screws in the 6th and 11th holes of the installation area on both front rails.
- 2. Open the rear door of the cabinet.
- 3. Remove six screws 1 (two screws from the top corner, two screws from the bottom corner, and the center screw on each side) from the air intake frame on the rear of the AlphaServer 4100 chassis. Save these screws for securing the air plenum to the rear of the AlphaServer 4100 chassis.
- 4. Align the air plenum 2 with the air intake frame on the rear of the AlphaServer 4100 chassis.
- 5. Secure the air plenum to the air intake frame on the rear of the AlphaServer 4100 chassis using the six screws that were removed in step 3.

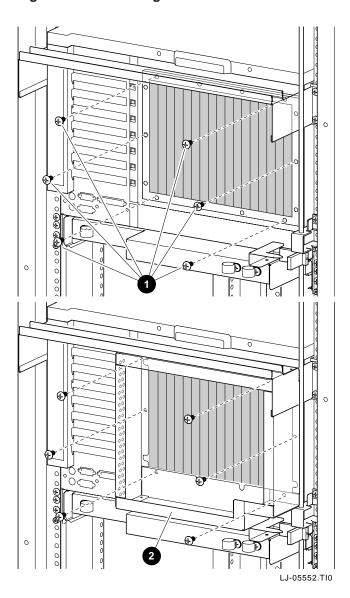


Figure 2–11 Installing the Air Plenum