

Ultra™ Enterprise™ Expansion Cabinet Installation and Service Manual



Sun Microsystems Computer Company
A Sun Microsystems, Inc. Business
2550 Garcia Avenue
Mountain View, CA 94043 U.S.A.
415 960-1300 FAX 415 969-9131
Part No.: 802-6084-11
Revision 10, April 1997

Copyright 1997 Sun Microsystems, Inc. 2550 Garcia Avenue, Mountain View, California 94043-1100 U.S.A. All rights reserved.

This product or document is protected by copyright and distributed under licenses restricting its use, copying, distribution, and decompilation. No part of this product or document may be reproduced in any form by any means without prior written authorization of Sun and its licensors, if any. Third-party software, including font technology, is copyrighted and licensed from Sun suppliers.

Parts of the product may be derived from Berkeley BSD systems, licensed from the University of California. UNIX is a registered trademark in the U.S. and other countries, exclusively licensed through X/Open Company, Ltd.

Sun, Sun Microsystems, the Sun logo, Ultra Enterprise, AnswerBook, SunDocs, and Solaris are trademarks, registered trademarks, or service marks of Sun Microsystems, Inc. in the U.S. and other countries. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the U.S. and other countries. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc.

The OPEN LOOK and Sun™ Graphical User Interface was developed by Sun Microsystems, Inc. for its users and licensees. Sun acknowledges the pioneering efforts of Xerox in researching and developing the concept of visual or graphical user interfaces for the computer industry. Sun holds a non-exclusive license from Xerox to the Xerox Graphical User Interface, which license also covers Sun's licensees who implement OPEN LOOK GUIs and otherwise comply with Sun's written license agreements.

RESTRICTED RIGHTS: Use, duplication, or disclosure by the U.S. Government is subject to restrictions of FAR 52.227-14(g)(2)(6/87) and FAR 52.227-19(6/87), or DFAR 252.227-7015(b)(6/95) and DFAR 227.7202-3(a).

DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.

Copyright 1997 Sun Microsystems, Inc., 2550 Garcia Avenue, Mountain View, California 94043-1100 Etatis-Unis. Tous droits réservés.

Ce produit ou document est protégé par un copyright et distribué avec des licences qui en restreignent l'utilisation, la copie, la distribution, et la décompilation. Aucune partie de ce produit ou document ne peut être reproduite sous aucune forme, par quelque moyen que ce soit, sans l'autorisation préalable et écrite de Sun et de ses bailleurs de licence, s'il y en a. Le logiciel détenu par des tiers, et qui comprend la technologie relative aux polices de caractères, est protégé par un copyright et licencié par des fournisseurs de Sun.

Des parties de ce produit pourront être dérivées des systèmes Berkeley BSD licenciés par l'Université de Californie. UNIX est une marque déposée aux Etats-Unis et dans d'autres pays et licenciée exclusivement par X/Open Company, Ltd.

Sun, Sun Microsystems, le logo Sun, Ultra Enterprise, AnswerBook, SunDocs, et Solaris sont des marques de fabrique ou des marques déposées, ou marques de service, de Sun Microsystems, Inc. aux Etats-Unis et dans d'autres pays. Toutes les marques SPARC sont utilisées sous licence et sont des marques de fabrique ou des marques déposées de SPARC International, Inc. aux Etats-Unis et dans d'autres pays. Les produits portant les marques SPARC sont basés sur une architecture développée par Sun Microsystems, Inc.

L'interface d'utilisation graphique OPEN LOOK et Sun™ a été développée par Sun Microsystems, Inc. pour ses utilisateurs et licenciés. Sun reconnaît les efforts de pionniers de Xerox pour la recherche et le développement du concept des interfaces d'utilisation visuelle ou graphique pour l'industrie de l'informatique. Sun détient une licence non exclusive de Xerox sur l'interface d'utilisation graphique Xerox, cette licence couvrant également les licenciés de Sun qui mettent en place l'interface d'utilisation graphique OPEN LOOK et qui en outre se conforment aux licences écrites de Sun.

CETTE PUBLICATION EST FOURNIE "EN L'ETAT" ET AUCUNE GARANTIE, EXPRESSE OU IMPLICITE, N'EST ACCORDEE, Y COMPRIS DES GARANTIES CONCERNANT LA VALEUR MARCHANDE, L'APTITUDE DE LA PUBLICATION A REpondre A UNE UTILISATION PARTICULIERE, OU LE FAIT QU'ELLE NE SOIT PAS CONTREFAISANTE DE PRODUIT DE TIERS. CE DENI DE GARANTIE NE S'APPLIQUERAIT PAS, DANS LA MESURE OU IL SERAIT TENU JURIDIQUEMENT NUL ET NON AVENU.



Please
Recycle



Adobe PostScript

Contents

Preface	xi
1. Preparing for Installation	1-1
1.1 Unpacking the Cabinet	1-1
1.2 Placing the Cabinet.	1-2
1.3 Adjusting the Levelling Pads	1-4
1.4 Standard Features.	1-6
1.5 Operating Environment.	1-7
1.6 Physical Characteristics	1-8
2. Cabling the System.	2-1
2.1 Preparing the Expansion Cabinet for Cabling	2-2
2.2 Connecting the AC Power Cord	2-4
2.3 Connecting the Ground Strap	2-8
2.4 Connecting the Fan-Fail Cable	2-9
2.4.1 Direct Connection	2-9
2.4.2 Daisy-Chain Connection	2-9

3. Powering On and Off	3-1
3.1 Powering On the System.....	3-1
3.2 Powering Off the System.....	3-4
4. Preparing for Service	4-1
4.1 Safety Requirements.....	4-1
4.2 Tools Required.....	4-2
4.3 Troubleshooting the Cabinet.....	4-2
4.4 System Status Indicators.....	4-2
4.5 Outer Cover Guide.....	4-3
4.5.1 Vented Front Door.....	4-4
4.5.2 Rear Screen Removal and Replacement.....	4-5
4.5.3 Kick Panel Removal and Replacement.....	4-6
4.5.4 Side Panel Removal and Replacement.....	4-7
4.5.5 Stabilizer Bar Extension and Retraction.....	4-8
5. Major Subassemblies	5-1
5.1 Fan Tray Assembly.....	5-1
5.2 Key Switch.....	5-3
5.3 Domestic and International Rack AC Input Cable Assembly	
5-6	
5.4 Universal Rack Power Sequencer.....	5-7
A. Product Specifications	A-1
A.1 Physical Specifications.....	A-1
A.2 Electrical Specifications.....	A-2
A.3 Environmental Requirements.....	A-3

B. Illustrated Parts Breakdown	B-1
---	------------

Figures

Figure 1-1	Moving the Cabinet.....	1-3
Figure 1-2	Removing the Rear Screen and Adjusting the Levelling Pads	1-4
Figure 1-3	Stabilizer Bar	1-5
Figure 1-4	Ultra Enterprise Expansion Cabinet.....	1-7
Figure 2-1	Opening the Front Door of the Cabinet.....	2-2
Figure 2-2	Removing the Rear Screen and Kick Panel	2-3
Figure 2-3	Power Sequencer Control Panel	2-5
Figure 2-4	Connecting the AC Power Cord	2-6
Figure 2-5	Connecting the Ground Strap	2-8
Figure 3-1	AC Power Sequencer Control Panel.....	3-2
Figure 4-1	Opening the Vented Front Door	4-4
Figure 4-2	Removing the Rear Screen Panel and Kick Panel.....	4-6
Figure 4-3	Removing the Side Panel	4-7
Figure 4-4	Extending the Stabilizer Bar.....	4-8
Figure 5-1	Removing and Replacing the Rack Fan Tray Assembly	5-2
Figure 5-2	Key Switch Cable Connection	5-4

Figure 5-3	Removing and Replacing the Key Switch	5-5
Figure 5-4	Removing and Replacing the AC Input Cable	5-6
Figure 5-5	Removing and Replacing the Power Sequencer	5-8
Figure B-1	Rear View: Ultra Enterprise Expansion Cabinet	B-2
Figure B-2	Front View: Side and Top Panels	B-3

Tables

Table 4-1	Cover Removal by Assembly	4-3
Table A-1	Cabinet Physical Specifications	A-1
Table A-2	Clearance and Service Access	A-1
Table A-3	Cabinet Shipping Specifications	A-2
Table A-4	Cabinet Electrical Specifications	A-2
Table A-5	Operating Environment	A-3
Table B-1	FRU List for the Ultra Enterprise Expansion Cabinet	B-1
Table B-2	Fan Assembly, Power Sequencer, and Panels	B-2
Table B-3	Side and Top Panels	B-3

Preface

The *Ultra Enterprise Expansion Cabinet Installation and Service Manual* provides procedures for unpacking and installing the Ultra™ Enterprise™ Expansion Cabinet. It also includes procedures to remove and replace the field-replaceable subassemblies in the expansion cabinet. Only a qualified service provider should perform the tasks in this book.

This manual does not cover the installation procedures for storage devices. To install storage devices in the expansion cabinet, refer to the documentation shipped with the storage device.

UNIX Commands

This document may not include specific software commands or procedures. Instead, it may name software tasks and refer you to operating system documentation or the handbook that was shipped with your new hardware.

The type of information that you might need to use references for includes:

- Shutting down the system
- Booting the system
- Configuring devices
- Other basic software procedures

See one or more of the following:

- *Solaris 2.x Handbook for SMCC Peripherals* contains Solaris™ 2.x software commands.

- On-line AnswerBook™ for the complete set of documentation supporting the Solaris 2.x software environment.
- Other software documentation that you received with your system.

Typographic Conventions

The following table describes the typographic changes used in this book.

Typeface or Symbol	Meaning	Example
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. <code>machine_name%</code> You have mail.
AaBbCc123	What you type, contrasted with on-screen computer output	<code>machine_name% su</code> Password:
<i>AaBbCc123</i>	Command-line placeholder: replace with a real name or value	To delete a file, type <code>rm filename</code> .
<i>AaBbCc123</i>	Book titles, new words or terms, or words to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be root to do this.

Shell Prompts

The following table shows the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

Shell	Prompt
C shell	<code>machine_name%</code>
C shell superuser	<code>machine_name#</code>
Bourne shell and Korn shell	<code>\$</code>
Bourne shell and Korn shell superuser	<code>#</code>

Related Documents

The following documents contain topics that relate to the information in the *Ultra Enterprise Expansion Cabinet Installation and Service Manual*.

Application	Title	Part Number
Installation	<i>Ultra Enterprise 6000/5000/4000 Systems Installation Guide</i>	802-3844
	<i>Ultra Enterprise 3000 System Installation Guide</i>	802-6050
Service	<i>Ultra Enterprise 6000/5000/4000 Systems Manual</i>	802-3845
	<i>Ultra Enterprise 3000 System Manual</i>	802-6051
Regulatory Compliance	<i>Ultra Enterprise System Cabinet Regulatory Compliance Manual</i>	802-3846

Ordering Sun Documents

SunDocsSM is a distribution program for Sun Microsystems technical documentation. Contact SunExpress for easy ordering and quick delivery. You can find a listing of available Sun documentation on the World Wide Web.

Table P-1 SunExpress Contact Information

Country	Telephone	Fax
Belgium	02-720-09-09	02-725-88-50
Canada	1-800-873-7869	1-800-944-0661
France	0800-90-61-57	0800-90-61-58
Germany	01-30-81-61-91	01-30-81-61-92
Holland	06-022-34-45	06-022-34-46
Japan	0120-33-9096	0120-33-9097
Luxembourg	32-2-720-09-09	32-2-725-88-50
Sweden	020-79-57-26	020-79-57-27
Switzerland	0800-55-19-26	0800-55-19-27
United Kingdom	0800-89-88-88	0800-89-88-87
United States	1-800-873-7869	1-800-944-0661

World Wide Web: <http://www.sun.com/sunexpress/>

Sun Welcomes Your Comments

Please use the *Reader Comment Card* that accompanies this document. We are interested in improving our documentation and welcome your comments and suggestions.

If a card is not available, you can email or fax your comments to us. Please include the part number of your document in the subject line of your email or fax message.

- Email: `smcc-docs@sun.com`
- Fax: SMCC Document Feedback
1-415-786-6443

Preparing for Installation

1

This chapter describes how to unpack and set up the Ultra Enterprise Expansion Cabinet. It also describes the expansion cabinet features.

1.1 Unpacking the Cabinet

If the cabinet is already unpacked, proceed to Section 1.2, “Placing the Cabinet.”

Note – Any unpacking instructions printed on the shipping carton take precedence over instructions in this section.

1. Immediately inspect all shipping containers for evidence of physical damage.

If a shipping carton is damaged, request that the carrier’s agent be present when the carton is opened. Keep all of the contents and packing material for the agent’s inspection.



Warning – Use three or more people to unpack and set up the cabinet. The shipping weight of the unit varies, depending on the number of devices that are shipped with the unit. A typical expansion cabinet can weigh from 500 to 1100 pounds (230 to 500 kg).

2. **Verify that the components you received match the shipping list.**
3. **Reassemble the packing materials and save them for future use after you have unpacked the cabinet.**

To prepare the cabinet for shipment or storage, follow (in reverse order) the graphic unpacking instructions attached to or printed on the panels of each shipping container.



Caution – If your cabinet is on a wooden pallet, extend the cabinet levelling pads so that the cabinet cannot roll during shipment or storage. (See Section 1.3, “Adjusting the Levelling Pads.”) If the original shipping pallet has side rails, it is not necessary to lower the levelling pads.

If you cannot store the shipping materials, recycle or dispose of the materials properly. Your local recycling authority can supply specific information.

1.2 *Placing the Cabinet*

Leave enough space to situate the expansion cabinet near the system cabinet. The ground strap between the expansion cabinet and the system cabinet is 2 meters long. (The procedure for connecting the ground strap is covered in detail in Chapter 2 of this manual.)



Caution – Never lift the cabinet by the cosmetic panel surfaces.

Use three or more people to move the cabinet safely, as shown in Figure 1-1. Two people must restrain the front of the cabinet to control the movement.

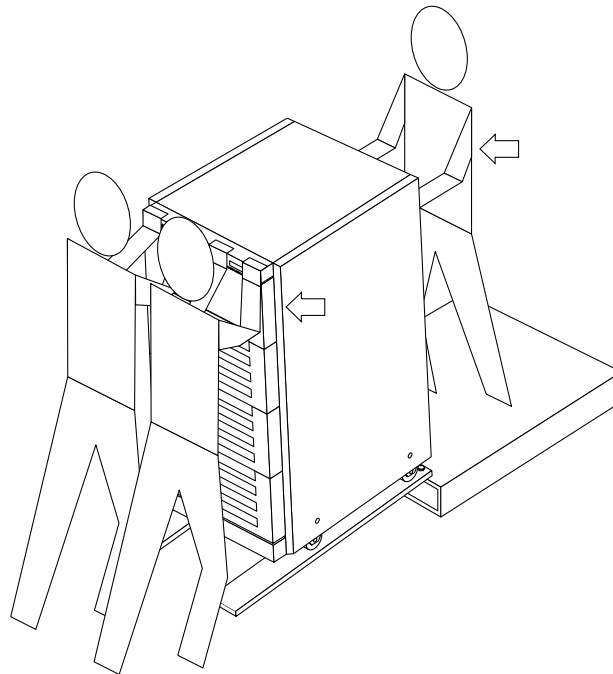


Figure 1-1 Moving the Cabinet

◆ **Wheel the unit to the work area.**

Avoid pulling on the vented front door. For cabinet mobility, allow 3 inches clearance on both sides of the cabinet.



Caution – To prevent the cabinet from tipping as you move it, push or pull only on the upper half of the cabinet.

1.3 Adjusting the Levelling Pads

Levelling pads are located at each corner of the base of the cabinet, as well as on the stabilizing bar in front of the cabinet. The cabinet is level when the levelling pads at the four corners securely touch the floor and the cabinet cannot be rocked in any direction.

1. Take off the rear screen by removing the two screws, as shown in Figure 1-2.

Note – If your cabinet has a hinged rear door, use the sliding door latch to open the door. If it becomes necessary to remove the rear door, remove the pins from the hinges and lift the door free of the chassis. Reverse this procedure to replace the door.

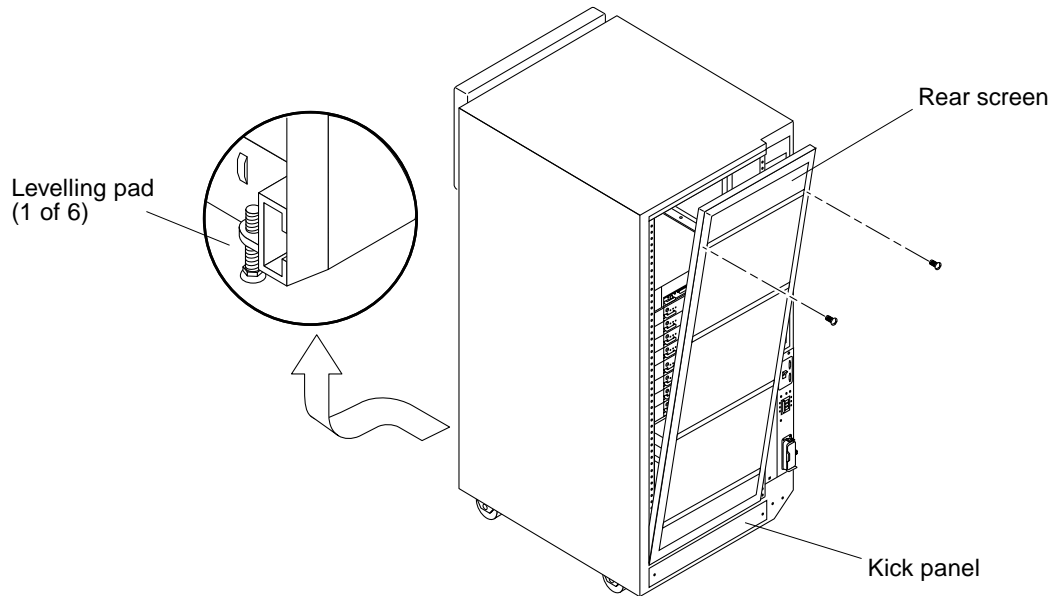


Figure 1-2 Removing the Rear Screen and Adjusting the Levelling Pads

2. **Remove the levelling wrench by unlocking the plastic strap that holds it to the inside of the frame, near the top of the cabinet.**
Do not cut the strap. Press the plastic tab to unlock the strap around the wrench, then slide part of the strap through the lock to loosen the wrench.
3. **Fully extend the stabilizer bar from the bottom of the cabinet (Figure 1-3).**
4. **Screw the two stabilizer bar levelling pads down until they are 1/8- to 1/4-inch (3 to 6 mm) above the floor.**
Make sure both pads are at equal heights above the floor. This clearance allows an extended stabilizer bar to stop the cabinet if it should begin to tilt.

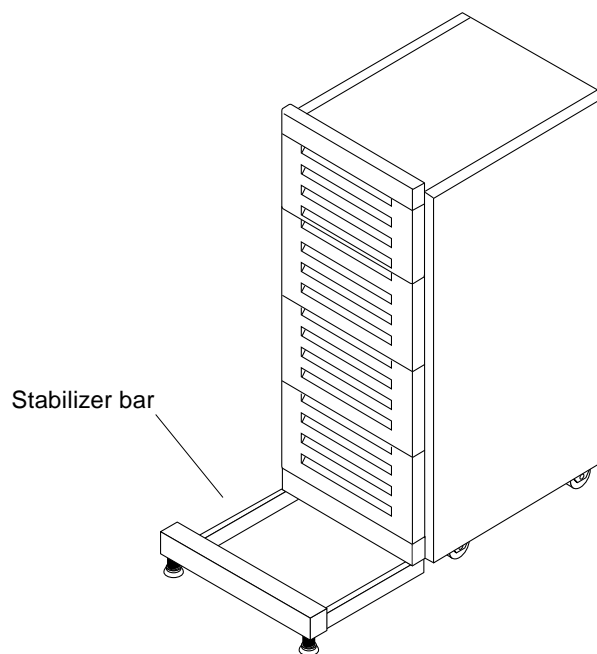


Figure 1-3 Stabilizer Bar

5. **Slide the stabilizer bar back into the cabinet.**



Caution – Always extend the stabilizer bar before you attempt to install new devices or service devices in the cabinet.

- 6. Adjust the four levelling pads on the cabinet frame using the levelling wrench. The four pads should press against the floor so that the cabinet does not move.**

To adjust the levelling pads on the cabinet rear, you may need to remove the kick panel. Two captive screws attach the panel to the cabinet (Figure 1-2).

- 7. After you finish adjusting the levelling pads:**
 - a. Secure the levelling wrench inside the cabinet.**
 - b. Replace the kick panel if it was removed.**
 - c. Attach the rear screen.**

1.4 Standard Features

The expansion cabinet contains the following:

- Power sequencer
- Fan tray assembly
- Space for storage devices

Figure 1-4 shows the expansion cabinet.

Note – The Ultra Enterprise Expansion Cabinet comes with a vented front door, which can be modified by replacing one or two of the top front panels to allow for tape drive access. If you order a tape device for the cabinet, a bezel for the device is shipped with it. To replace one or both of the top front panels with a bezel, refer to the documentation that comes with your tape device.

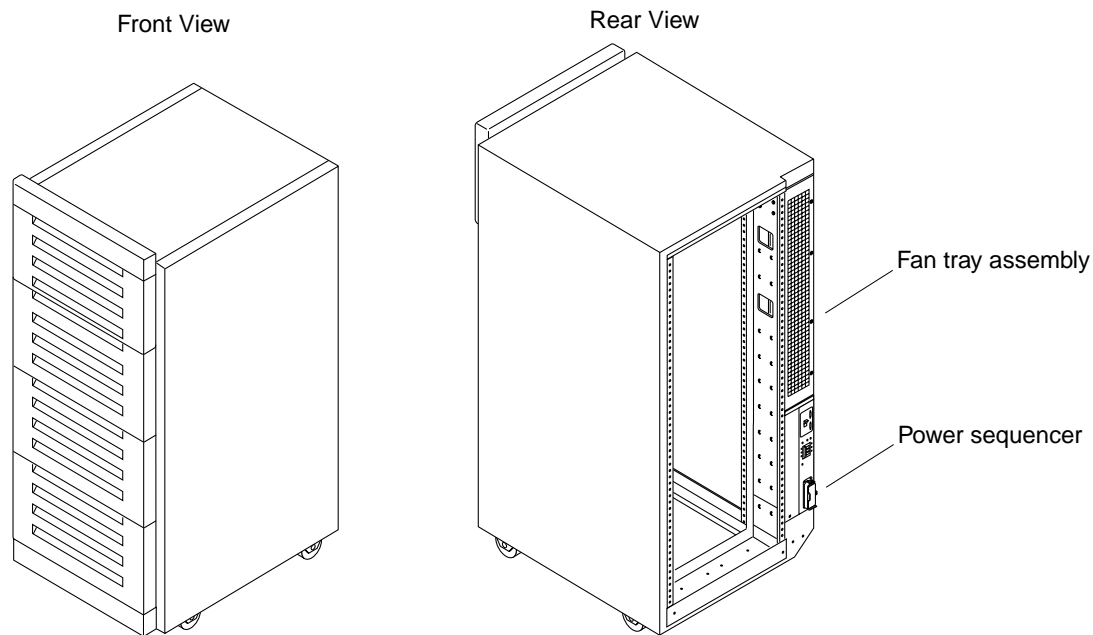


Figure 1-4 Ultra Enterprise Expansion Cabinet

1.5 Operating Environment

Avoid temperature extremes and keep the work area clean. Maintain the operating conditions described in Section A.3, “Environmental Requirements,” in Appendix A.

Sun Microsystems™ suggests installing the expansion cabinet in a computer room environment. Computer room installation provides secure access to computers and stored information, and provides control over environmental factors such as temperature, humidity, and airborne dust. Computer room installation also protects equipment from fire, flood, or other danger originating in the building.

1.6 Physical Characteristics

The physical characteristics of the expansion cabinet are as follows:

- Internal dimensions conform to EIA RS-310C standard (RETMA) for 19-inch racks. Universal mounting holes are used with 10-32UNF tapped holes in all locations. The nominal rack opening is 17.875 inches.
- A vertical panel opening of 28 Rack Unit (RU) minimum is provided to accommodate eight 3 RU subsystems plus an additional 4 RU. (One RU is equal to 1.75 inches.)
- Overall cabinet height with cosmetic panels is 56 inches maximum.
- Extra width is provided on the side of the cabinet (outboard of the vertical mounting rail) for cabling, additional components, etc. This extra width is sufficient to accommodate a 3 RU (5.25-inch) subsystem on end.
- Cabinet depth, with panels removed, is less than 34 inches to facilitate moving cabinets through standard 36-inch doorways.
- Cabinet structure and casters are designed to handle a 1200-pound static load.



Caution – Make no mechanical or electrical modifications to this cabinet. Sun Microsystems is not responsible for the regulatory compliance if the cabinet is modified.

Cabling the System



This chapter describes how to connect the power cord to the Ultra Enterprise Expansion Cabinet power sequencer, and how to connect the ground strap and fan-fail cable from the expansion cabinet to the server and other cabinets.

For instructions on how to cable storage device options in the cabinet, refer to the documentation that is shipped with each device.

2.1 Preparing the Expansion Cabinet for Cabling

Removing the Rear Screen and Kick Panel

1. Grasp the vented panel of the front door with one hand and pull it open.

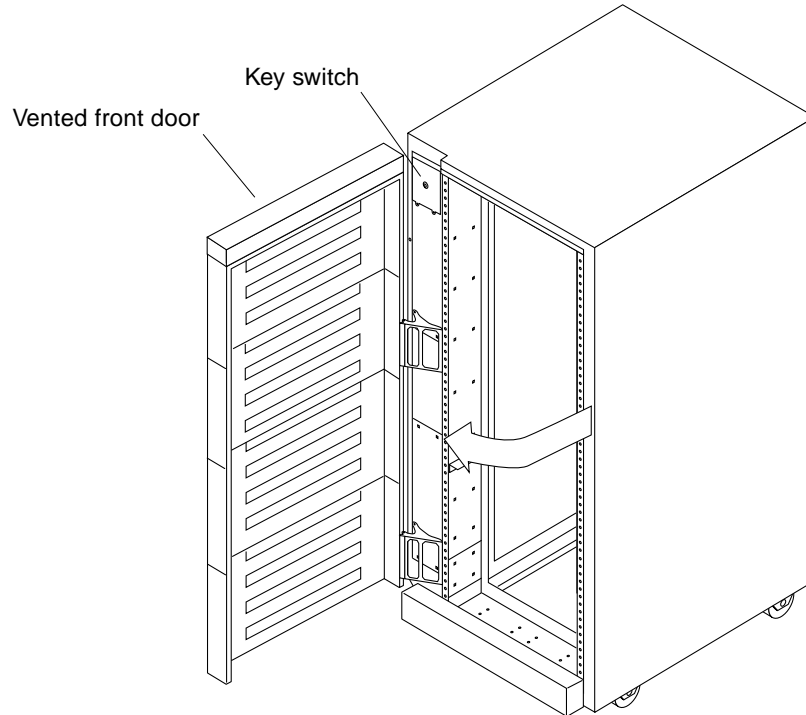


Figure 2-1 Opening the Front Door of the Cabinet

2. Verify that the key switch located at the front of the cabinet is in the **Standby position**.

Keys for this switch are packed in the kit that was shipped with your cabinet.

3. Open the rear of the expansion cabinet.

- If your expansion cabinet has a hinged rear door, use the sliding door latch to open the door.
- If your expansion cabinet has a rear screen, remove two screws near the top of the screen (Figure 2-2), then tilt the screen out and lift it free of the chassis. Set the screen aside.

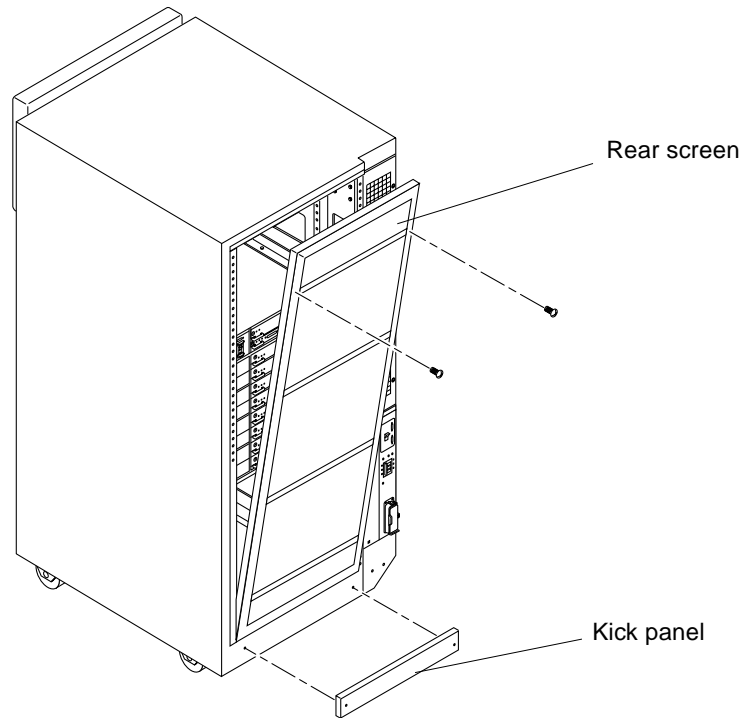


Figure 2-2 Removing the Rear Screen and Kick Panel

4. Loosen the two screws on the kick panel and remove it (Figure 2-2). Set the panel aside.

Note – You need to remove the kick panel only if you decide to route the cables between the bottom panel and the kick panel. This is suggested if you are routing cables under the floor.

Replacing the Rear Screen and Kick Panel

- 1. Tighten the two screws to secure the kick panel to the cabinet.**
Cables should be routed between the bottom panel and the kick panel if you are routing cables under the floor.
- 2. Close the rear of the expansion cabinet.**
 - If your expansion cabinet has a hinged rear door, use the sliding door latch to close the door.
 - If your expansion cabinet has a rear screen:
 - a. Place the bottom of the rear screen on the flanges near the cabinet bottom.**
 - b. Tilt the rear screen against the frame and install two screws to secure the screen in place (Figure 2-2).**
- 3. After all cables have been connected and the screen and panel have been replaced, power on the system.**
See Section 3.1, “Powering On the System.”

2.2 Connecting the AC Power Cord



Caution – The Enterprise Expansion Cabinet is designed to work with single phase power systems that have a grounded neutral conductor. To reduce the risk of electric shock, do not plug the expansion cabinet into any other type of power system.

- 1. Open the rear door, or remove the rear screen.**
See Section 2.1, “Preparing the Expansion Cabinet for Cabling.”

Note – You need to remove the kick panel only if you are connecting cables other than the cabinet AC power cord. The AC power cord can be routed directly from the base of the power sequencer.

- 2. At the rear of the server system cabinet and the expansion cabinet, verify that the AC power sequencer circuit breaker is turned off on each cabinet, and that the Local/Remote switch is in the Local position (Figure 2-3).**

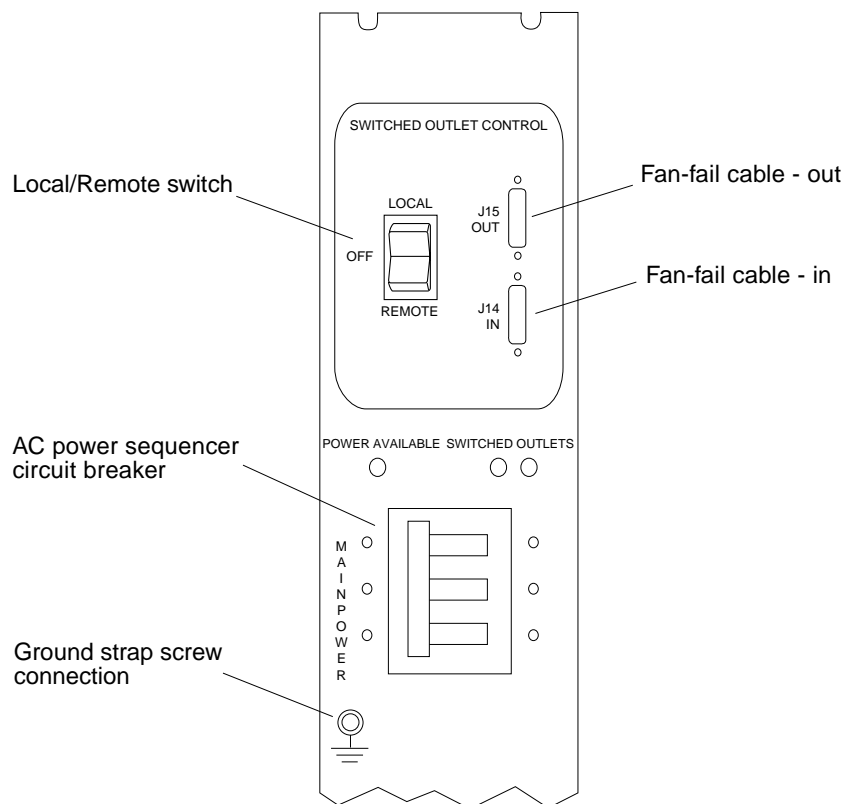


Figure 2-3 Power Sequencer Control Panel

3. Check the electrical ratings label on the serial number label attached to the power sequencer. Verify that the stated rating matches the AC input voltage to the system.

Voltage requirements for maximum system operating voltage and frequency ranges:

- Nominal AC input voltage range, single phase — 200 to 240 VAC
- Operating range — 180 to 264 VAC
- Operating frequency range — 47 to 63 Hz

Current requirements at nominal line voltage for a cabinet in maximum configuration:

- Nominal AC input voltage range, single phase — 200 to 240 VAC

- Maximum current requirement — 24A at 208 VAC
- Maximum current per power sequencer outlet — 10A

4. Connect the female end of the AC power cord to the power sequencer connector (Figure 2-4).

Flip the cover latch open to access the connector.

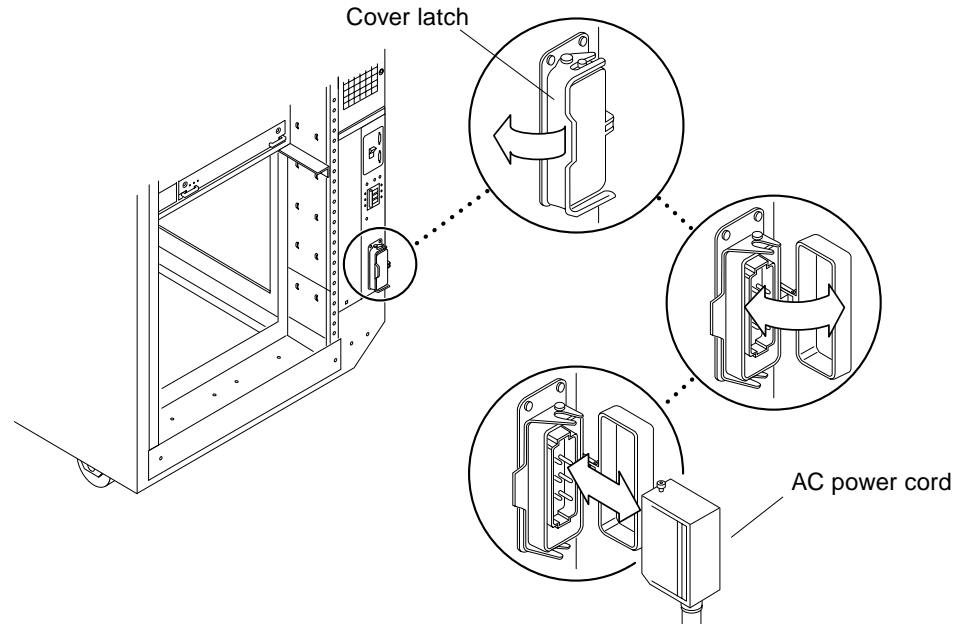


Figure 2-4 Connecting the AC Power Cord

5. Pull the latch over the power cord to secure it to the power socket.

Note – Route the power cord directly from the base of the power sequencer rather than routing it behind the kick panel.

6. Uncoil the AC power cord and connect it to a grounded outlet.

Caution – Risk of electric shock. Do NOT turn on AC power to the unit yet.



7. Continue routing cables for other internal devices, if necessary.

Refer to the documentation that came with your device for cabling instructions.

Note – Cable ties provided with the Enterprise Expansion Cabinet can be used as cable restraints. For each cable, pass a cable tie through one of the slits located along the base of the cabinet. Secure the cable in the cable tie.

8. Close the rear door, or replace the rear screen and kick panel.

See Section 2.1, “Preparing the Expansion Cabinet for Cabling.”



Caution – The Enterprise Expansion Cabinet has a high leakage current to ground. Strictly observe the instructions below to reduce risk of electric shock.

The following plug types are provided on the power cord:

- NEMA L6-30P for 200-240V North American operation
- 32A, single-phase, IEC 309 connector for 220-240V international operation

Note – If the appropriate mating receptacle is not available, the plug may be removed from the cord. The cord may then be permanently connected to a dedicated branch circuit by a qualified electrician. Check local electrical codes for proper installation requirements.



Caution – The installer must install an insulated grounding conductor as part of the circuit supplying power to the unit or system. This conductor must be of identical size, insulation material, and thickness to the neutral grounded and hot ungrounded branch-circuit supply conductors, but green (with or without yellow stripe[s]).

9. Ground the grounding conductor described in the warning above to either of the following:

- Earth at service equipment
- Supply transformer or motor-generator set (if supplied by a separately derived system)

The outlets in the vicinity of the unit must be of the grounding type, and the grounding conductors for these outlets must be connected to earth ground.

2.3 Connecting the Ground Strap

Connecting the ground strap between the expansion cabinet and the cabinet nearest to it prevents ground loops between the two cabinets and keeps data errors from occurring.

1. **Locate the 2-meter grounding strap from the kit that was shipped with your expansion cabinet.**
2. **Screw one end of the ground strap to the power sequencer on the system cabinet or cabinet nearest to expansion cabinet (Figure 2-3 and Figure 2-5).**

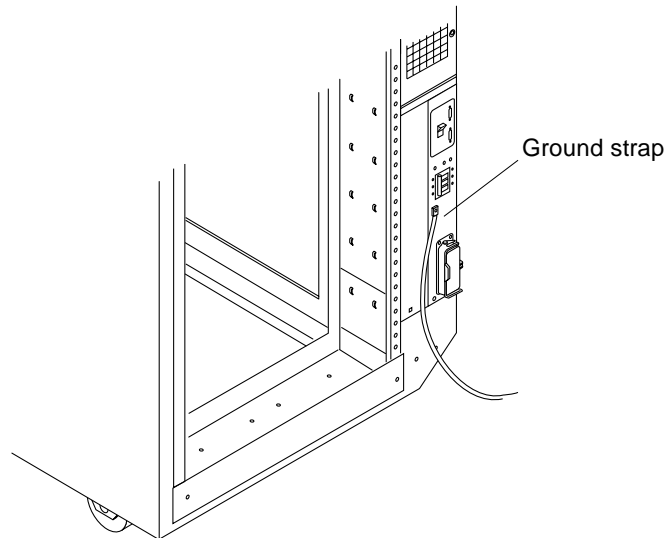


Figure 2-5 Connecting the Ground Strap

3. **Screw the other end of the ground strap to the power sequencer on the expansion cabinet (Figure 2-5).**

2.4 *Connecting the Fan-Fail Cable*

The fan-fail cable connection between the expansion cabinet and the system cabinet allows the system cabinet to detect errors with the fan tray assembly power source in the expansion cabinet. The expansion cabinet can be connected either directly to the system cabinet or in a daisy chain with the system cabinet and other expansion cabinets.

2.4.1 *Direct Connection*

1. **Connect one end of the fan-fail cable to the J15 port on the front of the power sequencer in the system cabinet (Figure 2-3).**
2. **Connect the other end of the fan-fail cable to the J14 port on the front of the power sequencer in the expansion cabinet (Figure 2-3).**

2.4.2 *Daisy-Chain Connection*

1. **Connect the fan-fail cable between the system cabinet and the first expansion cabinet in the chain.**
See Section 2.4.1, “Direct Connection.”

Note – The first connection in the daisy chain *must* be to the system cabinet.

2. **Connect a second fan-fail cable to the J15 port of the first expansion cabinet.**
3. **Connect the other end of the cable to the J14 port of the next cabinet in the chain.**
4. **Continue connecting each cable to the cabinets as described in Step 2 and Step 3 until the chain is completed.**

Powering On and Off

Use the information provided in this chapter to power on and off the Ultra Enterprise Expansion Cabinet.



Caution – To avoid damage to internal circuits, do not connect or disconnect any cable while the system is powered on.

3.1 Powering On the System

- 1. Open the front door of the expansion cabinet.**
- 2. Verify that the key switch located at the front of the expansion cabinet is in the Standby position.**
- 3. Turn the AC power sequencer circuit breaker at the rear of the cabinet to Off (Figure 3-1).**

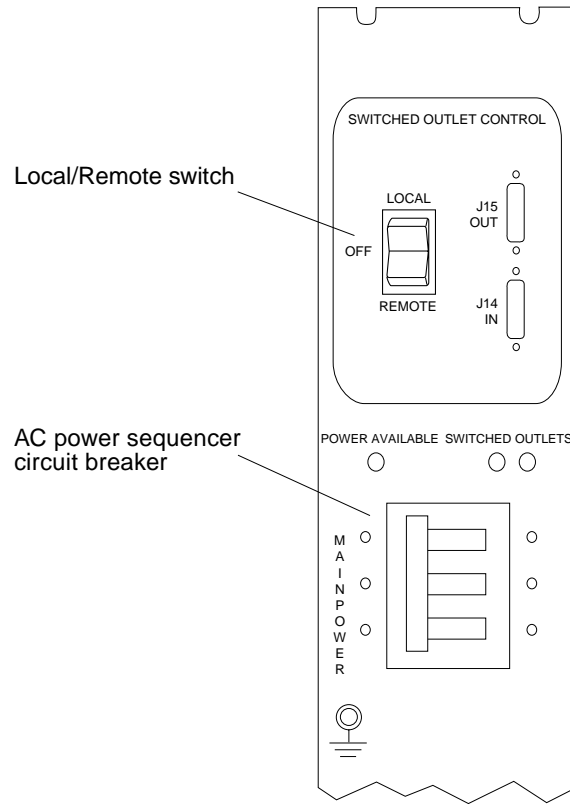


Figure 3-1 AC Power Sequencer Control Panel

4. Verify that the cabinet AC power cord is connected to an AC outlet.



Caution – Do not disconnect the AC power cord from the outlet when you work on or in the cabinet. This connection provides a ground path that prevents damage from electrostatic discharge.



Caution – Never move the system or expansion cabinets when system power is on. Excessive movement can cause catastrophic disk drive failure. Always power the system off before moving it.

5. Verify that the AC power sequencer circuit breaker on the system cabinet is turned off.

Refer to the installation manual you received with the system cabinet for instructions.

6. Set the Local/Remote switch on the expansion cabinet to Remote (Figure 3-1).

7. Turn the AC power sequencer circuit breaker on the expansion cabinet to On (Figure 3-1).

8. Turn the key switch at the front of the expansion cabinet to the on position.

The expansion cabinet will power on 20 seconds after the key switch is turned on. This will minimize power surges.

9. Turn the power on to the system cabinet.

Refer to the installation manual you received with your system cabinet for instructions. You may have to enter a specific software command when booting the system so that the system will recognize the expansion cabinet. Refer to your software documentation for more information.

For example, if your system is running on the Solaris 2.x operating system, you would enter the following command to boot the system so that it recognizes the expansion cabinet:

```
boot -r
```

After you turn on both cabinets, several things should happen:

- The cabinet fans will begin turning.
- The system will beep, telling you the system is ready.
- The terminal screen will light up once the internal self test is complete.

10. Close the front door to the expansion cabinet.

You may need to edit the configuration file for your devices. Refer to the documentation for the particular device, and to the *Solaris Handbook for SMCC Peripherals* for software instructions.

3.2 Powering Off the System

Note – Failure to halt the operating system properly can cause the loss of disk drive data.

Before you turn off the power to the expansion cabinet, you must halt the operating system. Refer to the *Solaris Handbook for SMCC Peripherals* or the system administration guides that correspond to your operating system for specific instructions.

1. **Notify users that the system is going down.**
2. **Back up the system files and data, if necessary.**
3. **Halt the system using the appropriate commands.**
Refer to the *Solaris Handbook for SMCC Peripherals* that corresponds to your operating system.
4. **Open the front door of the expansion cabinet.**
5. **Turn the key switch located at the front of the cabinet to the Standby position.**
6. **At the rear of the expansion cabinet, turn the AC power sequencer circuit breaker to Off (Figure 3-1).**
7. **Turn off the power to other connected systems in this order:**
 - Storage devices
 - System cabinet AC power switch
 - Terminal



Caution – When you service disk or tape drives, do not disconnect the power cords from the power sequencer in the cabinet or the cabinet's power cord from the outlet. These connections provide the ground paths necessary to prevent any damage caused by electrostatic discharge to the drives installed in the cabinet.

8. **If you are servicing components other than disk drives (such as the power sequencer), disconnect the cabinet power cord from the grounded outlet.**

Preparing for Service



4.1 Safety Requirements

Ensure that the voltage and frequency of the power outlet to be used matches the electrical rating labels on the cabinet.

Wear an antistatic wrist strap when handling any magnetic storage devices or system boards.

Use only properly grounded power outlets.



Caution – DO NOT make mechanical or electrical modifications to the cabinet. Sun Microsystems is not responsible for regulatory compliance of modified cabinets.

4.2 *Tools Required*

- Screwdriver, Phillips #2
- Screwdriver, slotted, 1/4-inch
- Needlenose pliers

4.3 *Troubleshooting the Cabinet*

Use this checklist as a guide for isolating common installation problems.

- Verify that all terminators are properly installed.
- Verify that all power and data cables are properly installed.
- Verify that the same SCSI address is not being used by two or more drives on the same SCSI bus.
- Verify that the power is turned on to the drives, trays, and cabinet.

Refer to the service manual for the peripheral device if you need troubleshooting information for a specific drive or tray.

4.4 *System Status Indicators*

The power status indicator for the expansion cabinet is located on the power sequencer at the rear of the cabinet. For locations of status indicators for storage devices, refer to the documentation that came with your device.

4.5 Outer Cover Guide

Use Table 4-1 to determine which covers need to be opened or removed to access the field-replaceable units for the expansion cabinet.

Table 4-1 Cover Removal by Assembly

	Vented Front Door	Rear Screen or Door	Kick Panel	Left Side Panel	Right Side Panel	Stabilizer Bar
Fan Assembly		X				
Key Switch	X				X	
Power Sequencer		X			X	
External Cables		X	X			
SCSI Drives or Trays	X	X	X	X ¹	X ¹	X

1. You do not have to remove the side panels to work on a SCSI drive or drive tray within the expansion cabinet, but you may want to remove them to make the servicing the device easier.

Refer to the following sections for remove and replace procedures for the outer covers:

- Rear Screen Removal and Replacement — Section 4.5.2
- Kick Panel Removal and Replacement — Section 4.5.3
- Side Panel Removal and Replacement — Section 4.5.4
- Stabilizer Bar Extension and Retraction — Section 4.5.5

4.5.1 Vented Front Door

To open the vented front door

- ◆ **Grasp the vented panel of the front door with one hand and pull the door open.**

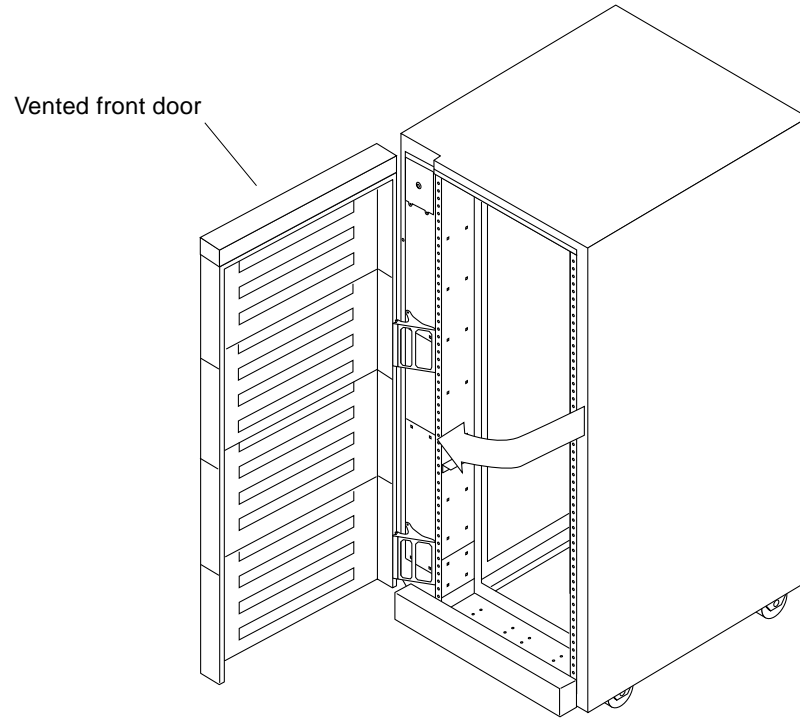


Figure 4-1 Opening the Vented Front Door

4.5.2 Rear Screen Removal and Replacement

To remove the rear screen

1. **Face the rear of the cabinet and remove the two screws at the top of the rear screen panel (Figure 4-2).**

Note – If your cabinet has a hinged rear door, use the sliding door latch to open the door. If it is necessary to remove the door, remove the pins from the hinges and lift the door free of the chassis. Reverse this procedure to replace the door.

2. **Pull the top of the rear screen panel away from the cabinet.**
3. **Lift the rear screen panel until the bottom is clear and lift the panel away.**
Set the rear screen panel aside.

To replace the rear screen

1. **Insert the panel so the bottom flange engages the frame.**
2. **Tilt the panel flush against the frame and secure the panel with the two screws.**

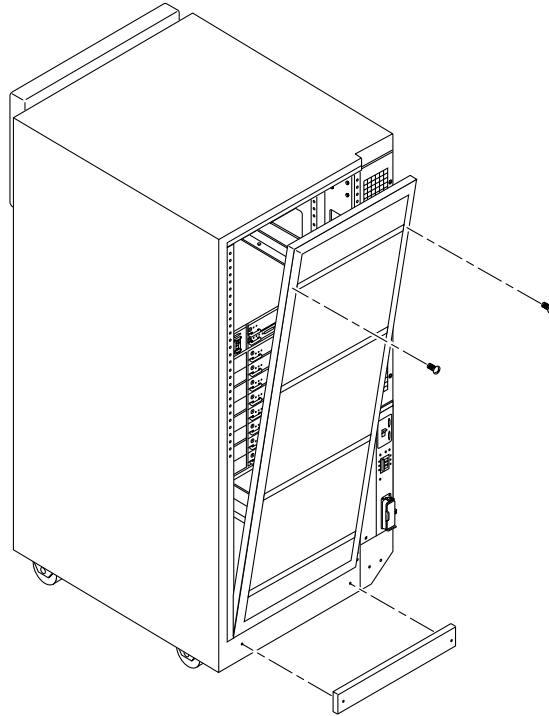


Figure 4-2 Removing the Rear Screen Panel and Kick Panel

4.5.3 Kick Panel Removal and Replacement

To remove the kick panel

- 1. Loosen the two captive screws that secure the kick panel to the unit (Figure 4-2).**
- 2. Remove the kick panel and set it aside.**

To replace the kick panel

- 1. Position the panel against the frame so the screw holes align with the holes in the frame.**
- 2. Tighten the two captive screws to secure the panel in place.**

4.5.4 Side Panel Removal and Replacement

To remove a side panel

- 1. Loosen the two captive screws at the bottom of the side panel (Figure 4-3).**
- 2. Firmly grasp the outer edges of the side panel and lift up on the panel to release the catches at the top.**
Set the panel aside.

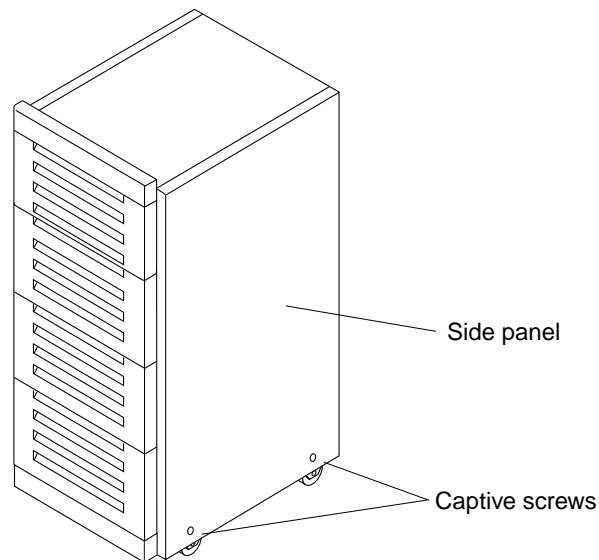


Figure 4-3 Removing the Side Panel

To replace a side panel

- 1. Place the panel against the cabinet so notches on the panel backside align with ears at the chassis top, and lower the panel into place.**
It should hang flush against the chassis.
- 2. Tighten the two captive screws at the base of the panel to secure it.**

4.5.5 Stabilizer Bar Extension and Retraction

To extend the stabilizer bar

- ◆ Grasp the stabilizer bar from underneath the front edge of the cabinet and pull the bar out to its fully extended position.

To retract the stabilizer bar

- ◆ Push the stabilizer bar back completely underneath the cabinet.

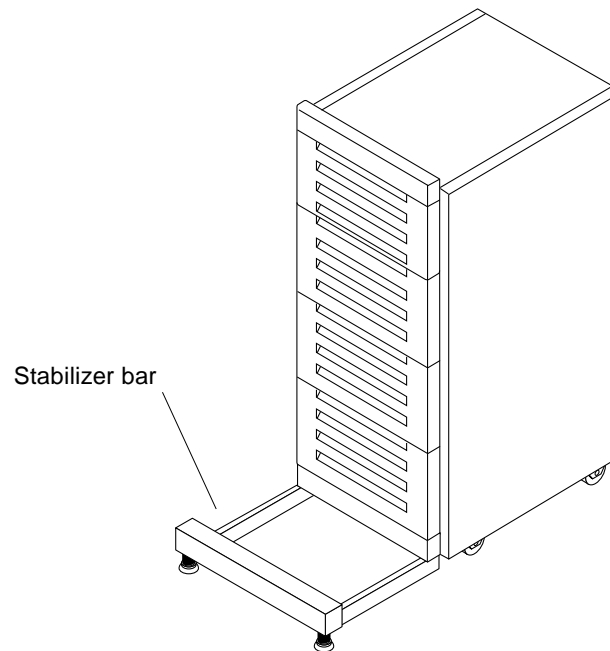


Figure 4-4 Extending the Stabilizer Bar

This chapter provides the procedures to remove and replace all field replaceable units for the Ultra Enterprise Expansion Cabinet. See Chapter 4, “Preparing for Service,” for a list of tools required and for access information.

4.1 Fan Tray Assembly

To remove the fan tray assembly

1. **Remove the fan tray screen at the right rear of the chassis (Figure 4-1).**
 - a. **Loosen the top screw on the left of the fan tray screen and the three screws on the right of the fan tray screen.**

It is not necessary to remove these four screws since the screen has keyholes.
 - b. **Remove the two bottom screws on the left of the fan tray screen.**

Removing these screws will ensure adequate clearance.
 - c. **Lift the screen up until the keyholes clear the screw heads, and set the screen aside.**

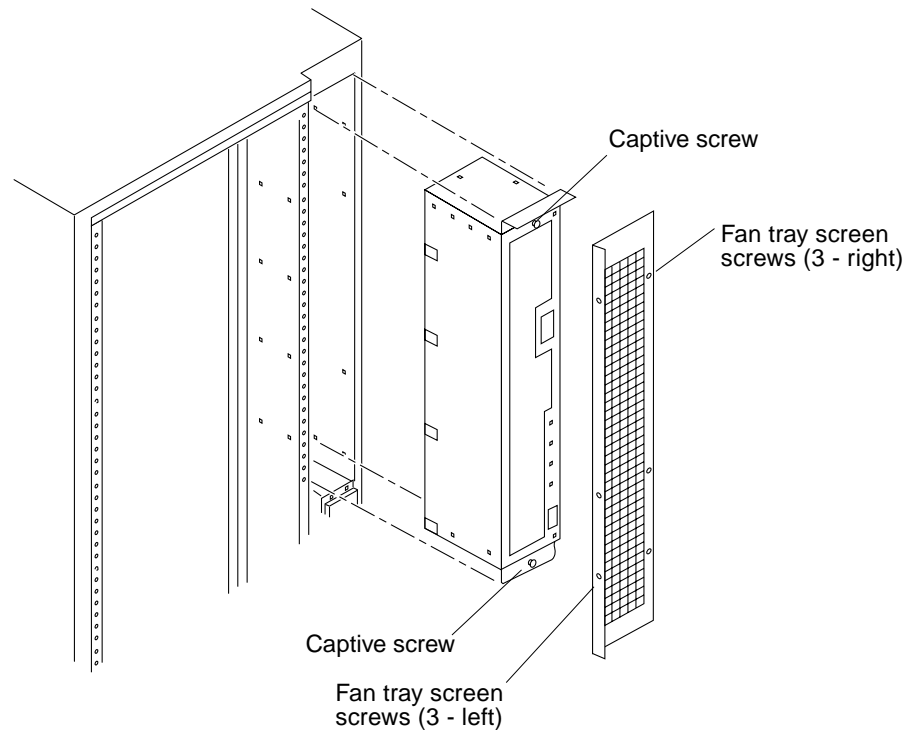


Figure 4-1 Removing and Replacing the Rack Fan Tray Assembly

- 2. Remove the power cable and fan cable from the connectors on the front of the fan tray assembly.**
- 3. Loosen the captive screw at the top and bottom of the fan tray. (Figure 4-1).**
- 4. Tilt the fan tray assembly back slightly so that it clears the top of the chassis.**
- 5. Remove the fan tray assembly.**

To replace the fan tray assembly

1. **Tilt the fan tray assembly inward and lower it behind the upper sequencer bracket.**
2. **Push the fan tray all the way back into its slot in the chassis.**
3. **Tighten the captive screw at the top and bottom of the fan tray.**
4. **Connect the power cable and fan cable to the front of the fan tray assembly.**
5. **Replace the fan tray screen.**
 - a. **Place the screen so that the keyholes clear the screw heads.**
 - b. **Tighten the top screw on the left and the three screws on the right.**
 - c. **Replace the two bottom screws on the left.**

4.2 Key Switch

To remove the key switch

1. **Make sure that the power to the expansion cabinet is completely turned off.**
See Section 3.2, “Powering Off the System.”
2. **Disconnect the key switch cable connector from the adapter cable connector near the rear of the power sequencer (Figure 4-2).**
The adapter cable remains connected to the power sequencer.
3. **Remove the Phillips screws and cable ties that secure the key switch cable to the chassis frame.**
Each screw secures a clamp on the frame that holds the cable in place.

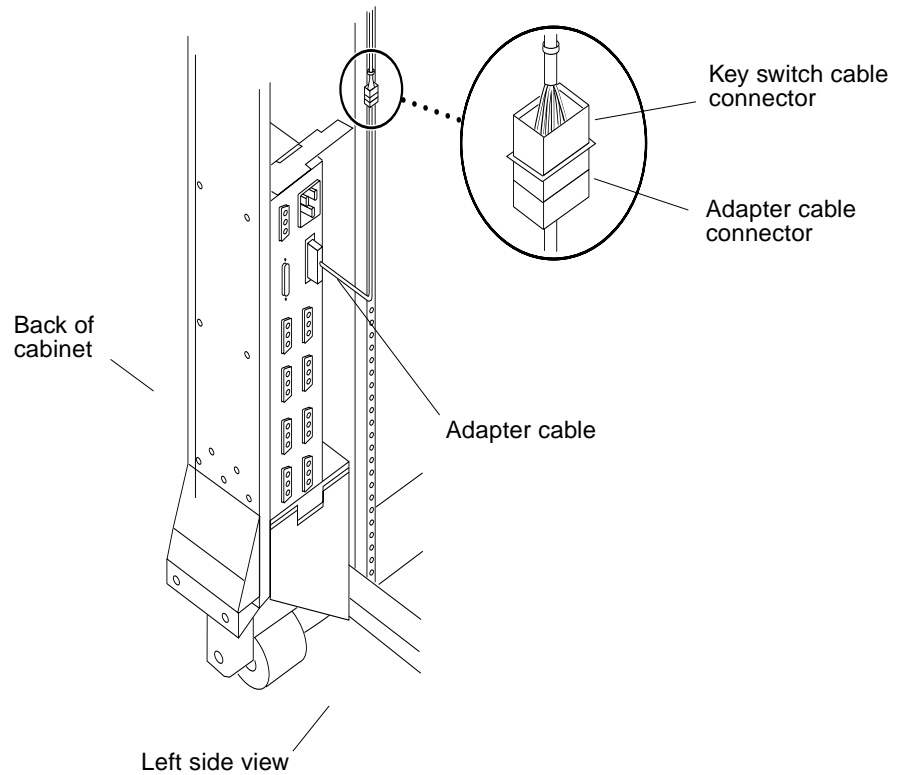


Figure 4-2 Key Switch Cable Connection

4. Facing the back of the key switch on the inside of the cabinet, use a pair of needlenose pliers to slide out and remove the metal clip that secures the key switch to the cabinet (Figure 4-4).
5. Pull the key switch out of the chassis opening.

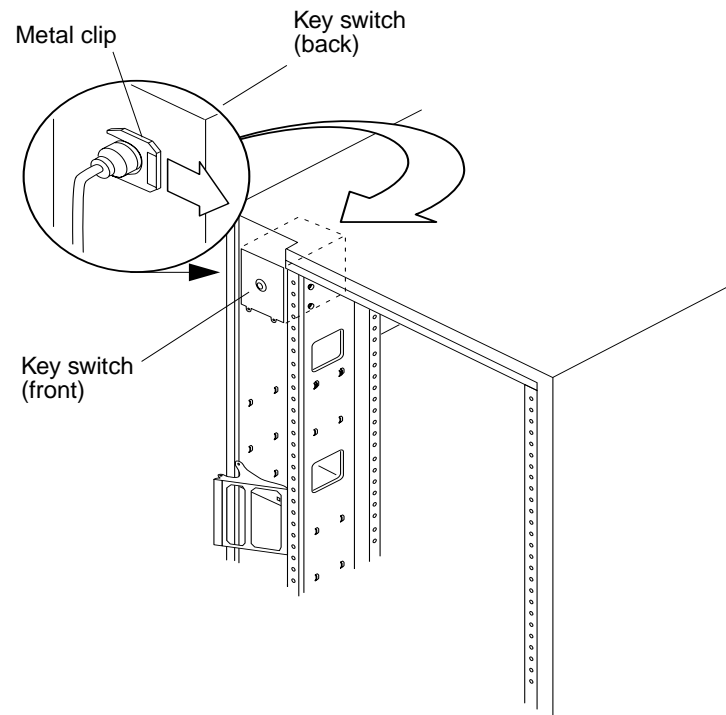


Figure 4-3 Removing and Replacing the Key Switch

To replace the key switch

- 1. Insert the key switch into the chassis opening.**
- 2. Facing the back of the key switch on the inside of the cabinet, slide the metal clip onto the notch of the key switch body to secure it in place (Figure 4-3).**
- 3. Route the key switch cable to the power sequencer, securing it to the chassis frame with cable ties and Phillips screws.**
Each screw secures a clamp on the frame that holds the cable in place.
- 4. Connect the key switch cable connector to the adapter-cable connector near the rear of the power sequencer (Figure 4-2).**
- 5. Power on the expansion cabinet.**
See Section 3.1, “Powering On the System.”

4.3 Domestic and International Rack AC Input Cable Assembly

To remove the AC input cable assembly

- 1. Make sure that the power to the expansion cabinet is completely turned off.**
See Section 3.2, “Powering Off the System.”
- 2. Disconnect the AC power cord from the power socket (Figure 4-4).**
- 3. Close the power connector cover over the power socket.**
- 4. Pull the latch up over the cover to secure it.**

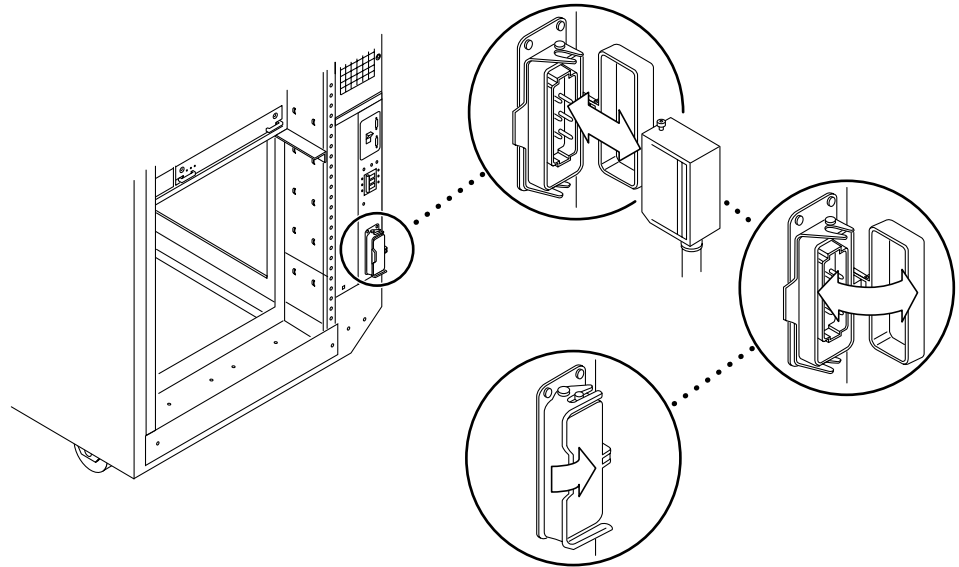


Figure 4-4 Removing and Replacing the AC Input Cable

To replace the AC input cable assembly

- 1. Pull back the power connector cover to expose the power socket.**
Flip the cover latch open to access the connector.
- 2. Connect the power cord to the power socket (Figure 4-4).**
- 3. Pull the latch over the power cord to secure it to the power socket.**
- 4. Power on the expansion cabinet.**
See Section 3.1, “Powering On the System.”

4.4 Universal Rack Power Sequencer

To remove the power sequencer

- 1. Make sure that the power to the expansion cabinet is completely turned off.**
See Section 3.2, “Powering Off the System.”
- 2. Disconnect the key switch adapter cable from the mating power supply connector labeled J3 at the rear of the power sequencer.**
See Figure 4-2.
- 3. Remove the AC power cord from the power sequencer.**
See Section 4.3, “Domestic and International Rack AC Input Cable Assembly” for removal information.
- 4. Disconnect all other power cords and cables from the sequencer.**
- 5. Remove the four screws that secure the sequencer to the chassis (Figure 4-5).**
- 6. Tilt the power sequencer slightly so that it clears the top, and lift it up and out of the chassis.**

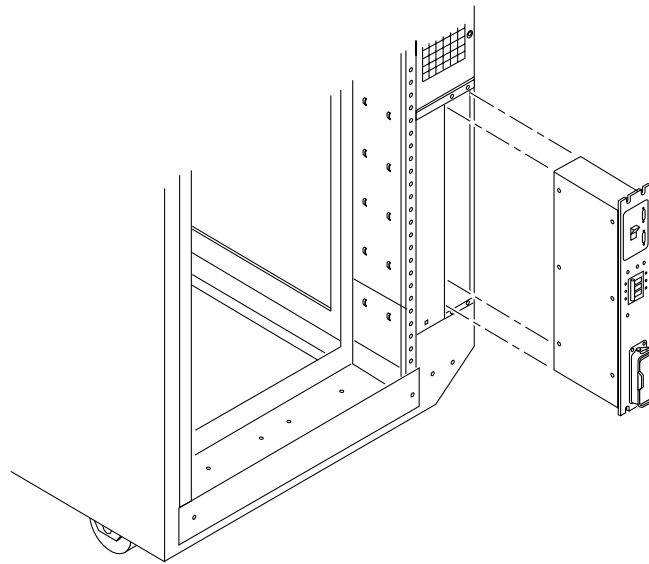


Figure 4-5 Removing and Replacing the Power Sequencer

To replace the power sequencer

1. **Tilt the power sequencer inward and seat the bottom in the chassis opening (Figure 4-5).**

There are two retainers at the bottom of the power sequencer which rest on the sheet metal at the bottom of the chassis opening.

2. **Push in the power sequencer so that it is flush against the chassis.**
3. **Tighten the four screws that secure the power sequencer to the chassis.**
4. **Connect the power cords and cables on the other side of the sequencer (Figure 4-2).**
5. **Connect the AC power cord.**
See Section 4.3, “Domestic and International Rack AC Input Cable Assembly.”
6. **Power on the expansion cabinet.**
See Section 3.1, “Powering On the System.”

Product Specifications



A.1 Physical Specifications

Table A-1 Cabinet Physical Specifications

	US	Metric
Height	56 in	143 cm
Width	30 in	77 cm
Depth	39 in	99 cm
Weight	1000 lb, approx	455 kg, approx
Power cord	15 ft	4.6 m

Table A-2 Clearance and Service Access

	With Service Access	Without Service Access	Comments
Front	48 in/122 cm	48 in/122 cm	
Rear	36 in/92 cm	36 in/92 cm	
Left	48 in/122 cm	2 in/5 cm	Side access may be required for some devices, such as some disk arrays. Refer to the device manual for specific details.
Right	48 in/122 cm	2 in/5 cm	

Table A-3 Cabinet Shipping Specifications

	Truck and Air Shipment	
	US	Metric
Height	62.5 in	160 cm
Width	36 in	91 cm
Depth	45.5 in	116 cm
Weight	1075 lb, approx	490 kg, approx

A.2 Electrical Specifications

Table A-4 Cabinet Electrical Specifications

Parameter	Value	
Input current	Voltage range	200 to 240 VAC
	Current, maximum	
	Current frequency range	47 to 63 Hz
Power rating	Total continuous power	4200W, maximum
Volt-Ampere rating		4990 VA
BTU rating		14,450 BTU
Power factor		0.85 to 0.88
Plug type	U.S.	NEMA L6-30P for 200 to 240 VAC
	International	32A, single phase IEC 309, connected for 220 to 240 VAC

A.3 *Environmental Requirements*

Table A-5 Operating Environment

Temperature	
Operating	41°F to 95°F (5°C to 35°C)
Non-operating	-41°F to 140°F (-20°C to 60°C)
Humidity	
Operating	20% to 80% RH, noncondensing 27°C maximum wet bulb
Non-operating	93% RH
Altitude	
Operating	0 to 9,843 ft. (0 to 3 km)
Non-operating	0 to 39,370 ft. (0 to 12 km)
Ventilation	Well ventilated or air-conditioned

Illustrated Parts Breakdown



The following items for the Ultra Enterprise Expansion Cabinet can be replaced at the customer site by a qualified field service engineer.

Table B-1 FRU List for the Ultra Enterprise Expansion Cabinet

FRU List Items	Part Number
Fan tray assembly, rack	540-2709-xx
Power sequencer, universal, rack	300-1290-xx
Assembly, cable, rack AC input, domestic	530-2265-xx
Assembly, cable, rack AC input, international	530-2266-xx
Assembly, cable, universal power cord	530-2197-xx
Assembly, cable, key switch adapter	530-2284-xx
Assembly, cable, main rack to expansion interface	530-2236-xx
Key switch	540-1285-xx

Note: The suffix -xx denotes the revision level of an assembly.

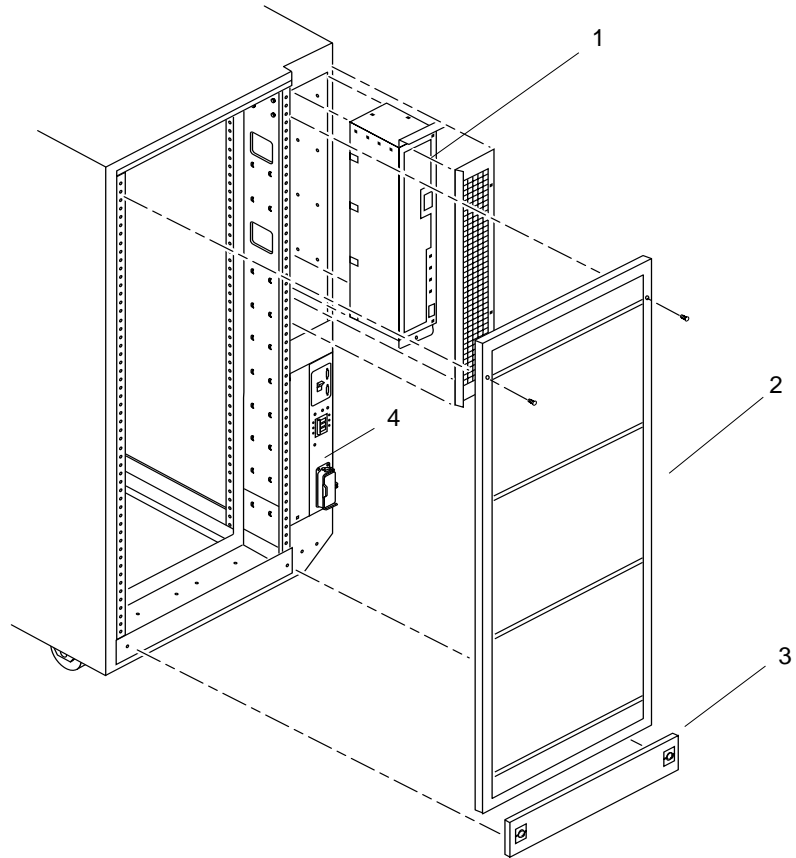


Figure B-1 Rear View: Ultra Enterprise Expansion Cabinet

Table B-2 Fan Assembly, Power Sequencer, and Panels

Key	Description
1	Fan tray assembly, rack
2	Rear screen panel or hinged rear door
3	Kick panel
4	Power sequencer, universal, rack

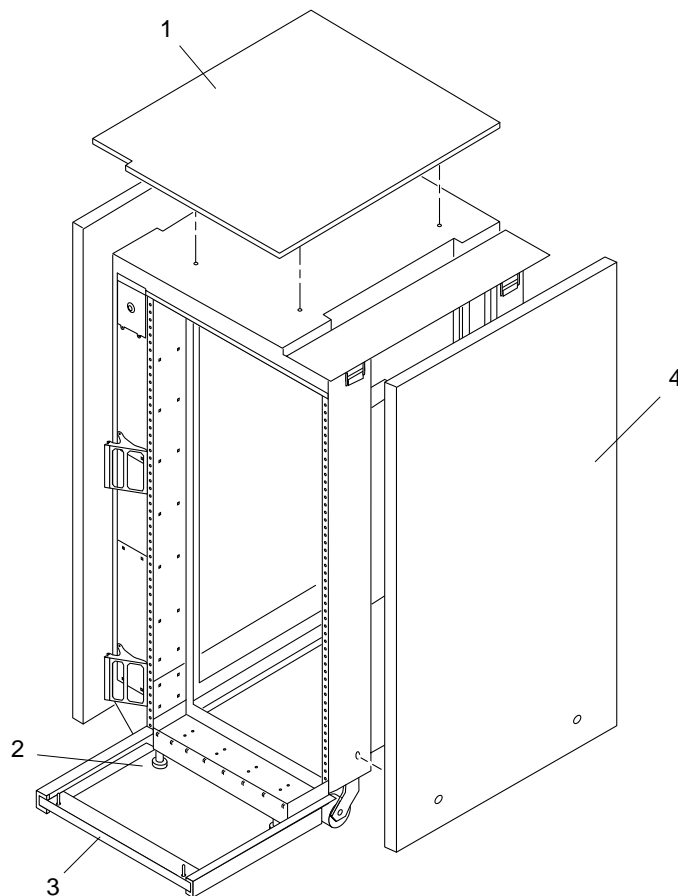


Figure B-2 Front View: Side and Top Panels

Table B-3 Side and Top Panels

Key	Description
1	Top panel
2	Levelling pad
3	Stabilizer bar
4	Side panel

Index

A

- AC input cable assembly, 5-6
 - FRU part number, B-1
 - removing, 5-6
 - replacing, 5-7
- AC power cord, 5-6
 - connecting, 2-4 to 2-7
 - FRU part number, B-1
 - removing, 5-6
 - replacing, 5-7
 - See also* AC input cable assembly
- AC power sequencer
 - circuit breaker, 2-5, 3-2
 - control panel, 3-2
 - fan-fail cable ports, 2-5
 - ground strap connection, 2-5
 - local/remote switch, 2-5, 3-2
 - location, 1-7
- adapter cable, key switch, 5-4
- adjusting the levelling pads, 1-4, 1-6

B

- bezel, tape drive, 1-6

C

- cabling, 2-1 to 2-9

- circuit breaker switch location, 3-2
- connecting
 - AC power cord, 2-4 to 2-7
 - fan-fail cable, 2-9
 - ground strap, 2-8
- cover removal for servicing, 4-3

E

- electrical current requirements, 2-5
- electrical shock warning, 2-4
- electrical specifications, A-2
- environmental requirements, A-3
- expansion cabinet
 - AC input cable assembly, 5-6
 - cabling, 2-1 to 2-9
 - fan tray assembly, 5-1 to 5-3
 - front and rear view, 1-7, B-2 to B-3
 - front door, 2-2, 4-4
 - key switch, 5-3 to 5-5
 - kick panel removal and replacement, 4-6
 - moving, 1-2 to 1-3
 - physical characteristics, 1-8
 - power sequencer, 5-7, B-2
 - rear screen removal and replacement, 4-5
 - side panel removal and replacement, 4-7

- specifications, A-1 to A-3
- stabilizer bar, 4-8
- unpacking, 1-1
- weight, 1-1, A-1, A-2

extending the stabilizer bar, 1-5, 4-8

F

fan tray assembly, 5-1 to 5-3

- FRU part number, B-1
- location, 1-7
- removing, 5-1 to 5-2
- replacing, 5-3

fan-fail cable

- connecting, 2-9
- FRU part number, B-1

front door, opening, 2-2, 4-4

FRUs (field-replacable units), B-1

G

ground strap, connecting, 2-8

H

hinged rear door, 1-4

I

installation, 1-1 to 1-8

K

key switch, 5-3 to 5-5

- adapter
 - FRU part number, B-1
- adapter cable, 5-4
- cable connector, 5-4
- FRU part number, B-1
- location, 2-2
- removing, 5-3 to 5-4
- replacing, 5-5

kick panel

- removing, 2-2 to 2-3, 4-6
- replacing, 2-4, 4-6

L

levelling pads, adjusting, 1-4 to 1-6

levelling wrench location, 1-5

local/remote switch location, 2-5, 3-2

M

major subassemblies, 5-1 to 5-8

moving the cabinet, 1-2 to 1-3

O

opening the front door, 2-2, 4-4

operating environment, 1-7, A-3

P

physical characteristics, 1-8

physical specifications, A-1

placing the cabinet, 1-2 to 1-3

power sequencer, 5-7

- circuit breaker, 2-5, 3-2
- control panel, 2-5, 3-2
- fan-fail cable ports, 2-5
- FRU part number, B-1
- ground strap connection, 2-5
- local/remote switch, 2-5, 3-2
- location, 1-7
- removing, 5-7
- replacing, 5-8

powering off the system, 3-4

powering on the system, 3-1 to 3-3

preparing for installation, 1-1 to 1-8

R

rear door, removing and replacing, 1-4

rear screen

- removing, 2-2 to 2-3, 4-5
- replacing, 2-4, 4-5

related documents, xiii

removing

- AC input cable assembly, 5-6
- AC power cord, 5-6

- covers, guide, 4-3
- fan tray assembly, 5-1 to 5-2
- key switch, 5-3 to 5-4
- kick panel, 2-2 to 2-3, 4-6
- power sequencer, 5-7
- rear screen, 2-2 to 2-3, 4-5
- side panel, 4-7

replacing

- AC input cable assembly, 5-7
- AC power cord, 5-7
- fan tray assembly, 5-3
- key switch, 5-5
- kick panel, 2-4, 4-6
- power sequencer, 5-8
- rear screen, 2-4, 4-5
- side panel, 4-7

retracting the stabilizer bar, 4-8

S

safety requirements, 4-1

side panel

- removing, 4-7
- replacing, 4-7

specifications, A-1 to A-3

- electrical, A-2
- environmental, A-3
- physical, A-1

stabilizer bar, 1-5

- extending, 4-8
- retracting, 4-8

status indicators, 4-2

T

tape drive bezel, 1-6

tools required, 4-2

troubleshooting, 4-2

U

Ultra Enterprise document list, xiii

unpacking the cabinet, 1-1

V

vented front door, opening, 4-4

Ordering Sun Documents

SunDocsSM is a distribution program for technical documentation and is available from SunExpress. To order or for more information:

Country	Phone	Fax	Country	Phone	Fax
Belgium	02-72-09-09	02-72-88-50	Luxembourg	32-2-72-09-09	32-2-725-88-50
Canada	1-800-873-7869	1-800-944-0661	Sweden	020-79-57-26	020-79-57-27
France	0800-90-61-57	080-90-61-58	Switzerland	0800-55-19-26	0800-55-19-27
Germany	01-30-81-61-31	01-30-81-61-92	United Kingdom	0800-89-88-88	0800-89-88-87
Holland	06-022-34-45	06-022-34-46	United States	1-800-873-7869	1-800-944-0661
Japan	0120-33-9096	0120-33-9097			

World Wide Web: <http://www.sun.com/sunexpress/>

Sun Welcomes Your Comments

We are interested in improving our documentation and welcome your comments. Use the reader comment card or send comments via email to: smcc-docs@sun.com.

You can also send a fax to SMCC Doc Feedback at 1-415 786-6443.

Please include the part number of your document in the subject line of your email or fax message.

Reader Comment Card

For the Ultra Enterprise Expansion Cabinet Installation and Service Manual, part number 802-6084-11.

1. Were the procedures documented thoroughly? _____

 2. Were the illustrations helpful? _____

 3. Was the information accurate and easy to follow? _____

 4. Did you refer to this manual online? _____

 5. Additional comments. _____

- Your Name: _____
Title: _____
Company Name: _____
Address: _____
City: _____ State/Province: _____
Zip/Postal Code: _____ Country: _____
Email Address: _____
Telephone: _____

**AIR MAIL
PAR AVION**

IBRS/CCRI No. 808



NE PAS AFFRANCHIR

NO POSTAGE
NECESSARY
IF MAILED
TO THE
UNITED STATES

INTERNATIONAL BUSINESS REPLY MAIL/RESPONSE PAYEE

PERMIT NO. 808

MOUNTAIN VIEW CA

POSTAGE WILL BE PAID BY ADDRESSEE

INFORMATION PRODUCTS
M/S MPK14-108
SUN MICROSYSTEMS INC
2550 GARCIA AVE
MOUNTAIN VIEW CA 94043-9551
UNITED STATES OF AMERICA

