

# Sun Enterprise™ 10000 System Dual Grid Power Option Installation Guide

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THE NETWORK IS THE COMPUTER™

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# Installation Procedure

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## Pre-Installation Requirements

You must meet the following conditions for the successful installation of the dual power option:

- SSP version installed that supports dual power grid installation
- Internal boot disks and other peripheral devices (except hub, AC sequencer, and Remote Power Control Module (RPCM) Shelf) relocated to external cabinet
- Five additional NEMA L6-30Rs (for North America) from another power source available (four if no AC sequencer is installed)

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# Pre-Installation Checklist

- The time for completed installation is determined.
- The most convenient time to connect power to all Sun Enterprise 10000 power cables is scheduled.
- The ultimate location is determined for the equipment that will be removed from the upper Sun Enterprise 10000 chassis, including but not limited to the following:
  - AC sequencer
  - Remote power control shelf
  - Hub
  - Internal boot disks

Make sure the following tasks are completed during the night before the installation of the dual power option to ensure a smooth and timely installation procedure:

- Sun Enterprise 10000 system is shut down.
- Sun Enterprise 10000 internal circuit breakers are turned off.
- Circuit breakers to the power cords are turned off.
- The necessary floor tiles are removed.
- All power cords from the receptacles are disconnected. Free ends of the cords are placed on the raised floor.

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**Note** – The free ends of the power cords are placed on the raised floor so that the cords are seen to be disconnected and the power grid labels can be installed.

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- Facility power modifications are performed.

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# Tools, Parts, and Hardware

## Tools Required

The following tools are necessary to install the dual power system:

- Screwdriver, #2 Phillips, with 6-inch shank
- Screwdriver, #2 Phillips, with short (stubby) shank and small diameter handle

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**Note** – A powered driver handle with a #2 Phillips tip is suggested for greater ease of installation.

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- Portable light to facilitate viewing inside the chassis

# Parts

**TABLE 1** Parts and Quantity

<b>Part</b>	<b>Quantity</b>
4U panel	2
Corner bracket	2
Horizontal rail	4
Trim angle	2
Trim plate	2
Data extension cable	2
Data extension cable screw lock	4
Latch strike bracket	2
Blank panel	2
Hot -swap status module assembly	1
Cable Kit	1
Dual Power Label Set	1
3/16 inch wrench	1

# Hardware

**TABLE 2** Hardware and Quantity

<b>Hardware</b>	<b>Quantity</b>
10-32x1/2 screws	16
M4 washer square cone	18
M4x10 panhead screw	18
M4x12 Phillips flathead	32
M5x10 black Phillips flathead	6
M4x6 Phillips panhead	2

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## Remove Selected Parts

- 1. Remove the front and rear doors of the chassis.**

Remove the side panels if they are accessible. This modification can be performed through the front and rear of the chassis if necessary.

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**Note** – For this installation procedure, the front of the chassis contains system boards 8 through 15, and the rear of the chassis contains system boards 0 through 7.

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- 2. Remove all peripherals, hub, AC Sequencer, input cables, Remote Power Control Modules (RPCM), and glove box (if installed) from the peripheral rack area.**

- 3. Remove the trim panels on the sides opposite the existing power shelves.**

Leave the brackets in place.

- 4. Set aside the existing hardware for use in reassembly.**

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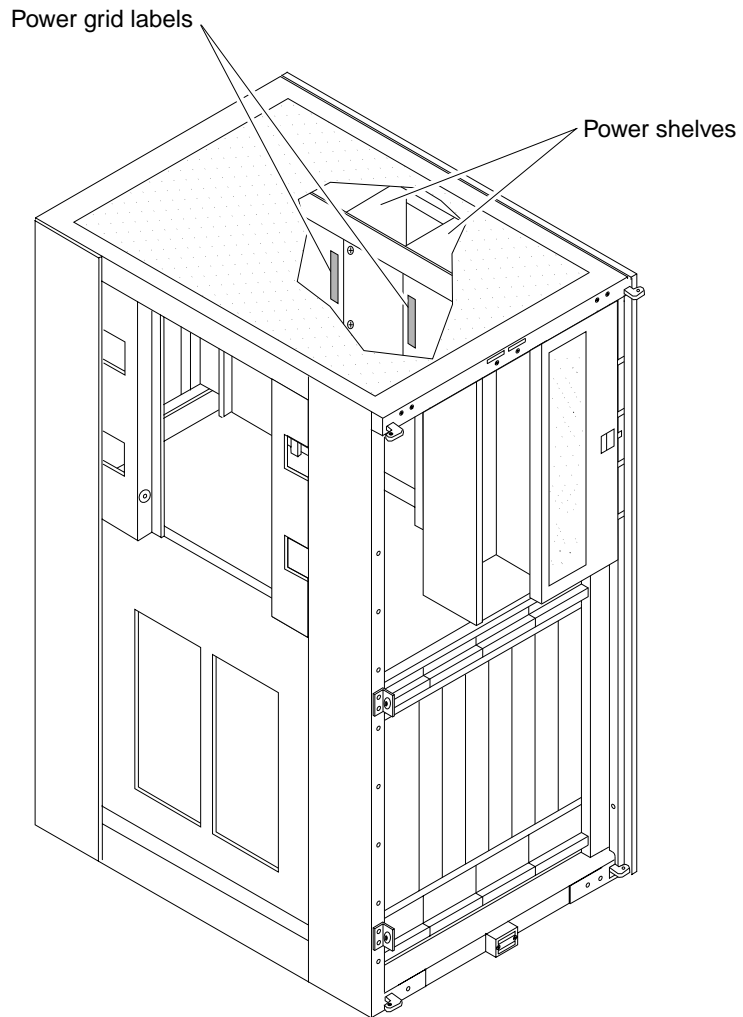
## Remove and Install Power Cables, and Install Ground Cables

- 1. Install labels “POWER GRID A” to the upper inside of the existing power shelves (FIGURE 1).**

The labels must also be placed so they are visible when the inside of the chassis is viewed from the front or back.

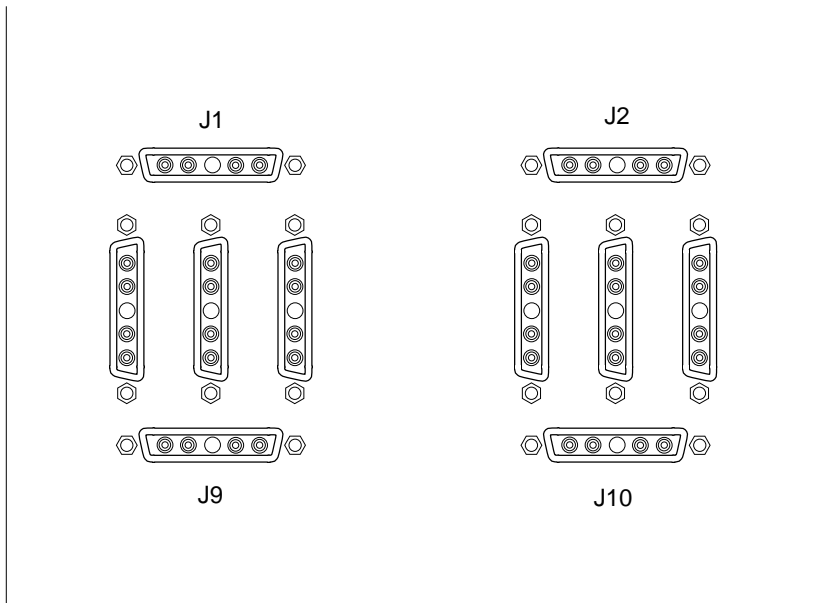
- 2. Remove the existing power cables (red jacket) from four horizontal connectors (J1, J2, J9, and J10) of the existing power shelves (FIGURE 2).**

Hold the screw locks in place with the 3/16 inch wrench while you remove the connector screws (FIGURE 3). If the screw locks are not held with the wrench, the loose hardware could fall inside the power shelf where it is difficult to recover. Discard these cables, they are not needed.

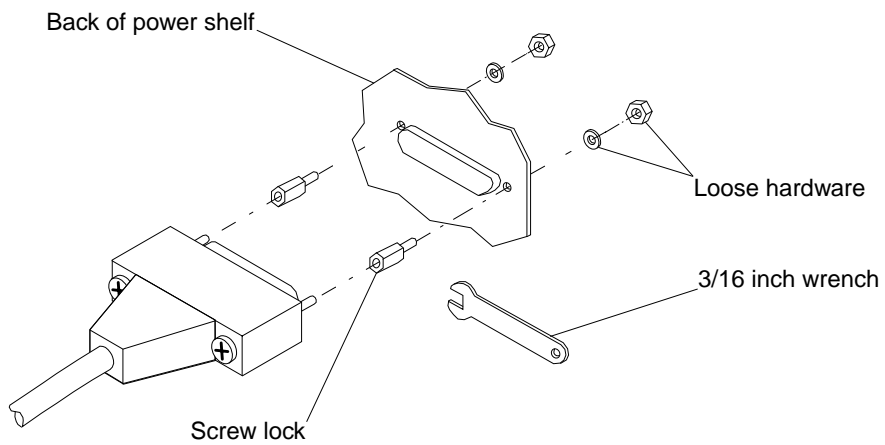


**FIGURE 1** Apply Power Grid Labels to Power Shelves—Typical





**FIGURE 2** Power Connectors on Existing Power Shelf—Typical



**FIGURE 3** Screw Lock Retention at Back of Power Shelf

3. **Ensure that loose connector hardware is installed on connectors before cables are attached to power shelves.**

Put a screw and washer on each side of the connector if they are not installed as captive hardware.

4. **Attach the (black) DC power cables to the lower horizontal connectors J9 and J10 on the existing power shelves (FIGURE 2).**

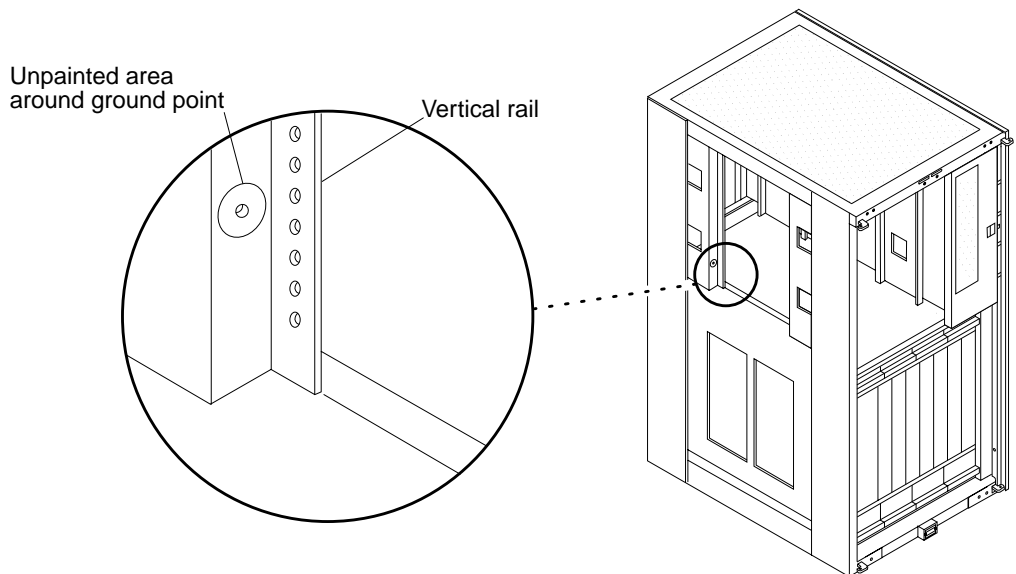
Install the outer connectors first then the inner connectors.

5. **Attach the straight connector ends of the (red) DC power cables to the upper horizontal connectors J1 and J2 on the existing power shelves (FIGURE 2).**

Install the outer connectors first then the inner connectors.

6. **Attach a ground cable to each vertical rail on the left side of the chassis (FIGURE 4).**

Install with a M4x10 screw in the hole that is surrounded by a 0.75 in. diameter area free of paint. Lay the free ends on the top of the card cage for later use.



**FIGURE 4** Ground Point Location—Typical

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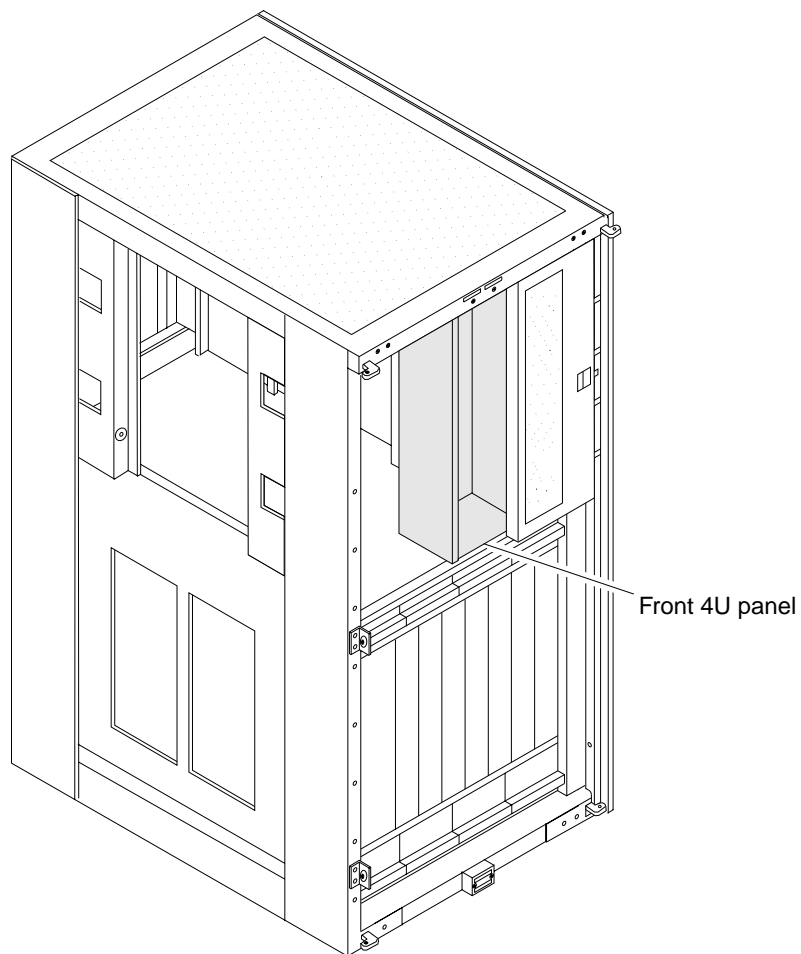
# Install the Front 4U Panel, Status Module Tray, and Attach the Data Cables

1. **Install only the front 4U panel on the RETMA rail near the existing power shelf with 10-32x1/2 screws in holes 8, 23, and 38 (counting from the bottom up). Leave the screws loose (FIGURE 5).**

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**Note** – The top of the 4U panel is even with the top of the existing power shelf door when it is installed correctly.

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**FIGURE 5** Front 4U Panel Installed

- 2. Place the status module tray all the way to the right side of the 4U panel.**
- 3. Fasten the status module tray with four 10-32 screws and tighten them fully.**

4. Modify the rear J11 data cable.
  - a. Remove the data cable from J11 (upper) connector on the back of the existing power shelf that is in the rear of the chassis.
  - b. Attach the label “SYSTEM: REAR J11” to the free end of the cable.
    - i. Attach the individual label to some spare backing paper.
    - ii. Attach the clear adhesive over the label so that the white tab does not obscure any part of the label.
    - iii. Remove the assembled label from the backing paper and attach it to the correct position on the cable assembly.

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**Note** – The status module tray assembly cables are prelabeled.

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- c. Attach the status module tray assembly cable labeled “SYSTEM: REAR J11” to the free end of the data cable from Step 4a.
  - d. Attach the status module tray assembly cable labeled “A: REAR J11” to the open connector J11.
5. Modify the rear J12 data cable.
    - a. Remove the data cable from J12 (below J11) connector on the back of the existing power shelf that is in the rear of the chassis.
    - b. Attach the label “SYSTEM: REAR J12” to the free end of the cable as in Step 4.
    - c. Attach the status module tray assembly cable labeled “SYSTEM: REAR J12” to the free end of the data cable from Step 5a.
    - d. Attach the status module tray assembly cable labeled “A: REAR J12” to the open connector J12.
  6. Modify the front J11 data cable.
    - a. Remove the data cable from J11 (upper) connector on the back of the existing power shelf that is in the front of the chassis.
    - b. Attach the label “SYSTEM: FRONT J11” to the free end of the cable as in Step 4.
    - c. Attach the status module tray assembly cable labeled “SYSTEM: FRONT J11” to the free end of the data cable from Step 6a.
    - d. Attach the status module tray assembly cable labeled “A: FRONT J11” to the open connector J11.

- 7. Modify the front J12 data cable.**
  - a. Remove the data cable from J12 (below J11) connector on the back of the existing power shelf that is in the front of the chassis.**
  - b. Attach the label “SYSTEM: FRONT J12” to the free end of the cable as in Step 4.**
  - c. Attach the status module tray assembly cable labeled “SYSTEM: FRONT J12” to the free end of the data cable from Step 7a.**
  - d. Attach the status module tray assembly cable labeled “A: FRONT J12” to the open connector J12.**
- 8. Lay the free ends of the four remaining data cables on the top of the card cage.**

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# Install the Rear 4U Panel, Brackets, Rails, and Trim Parts

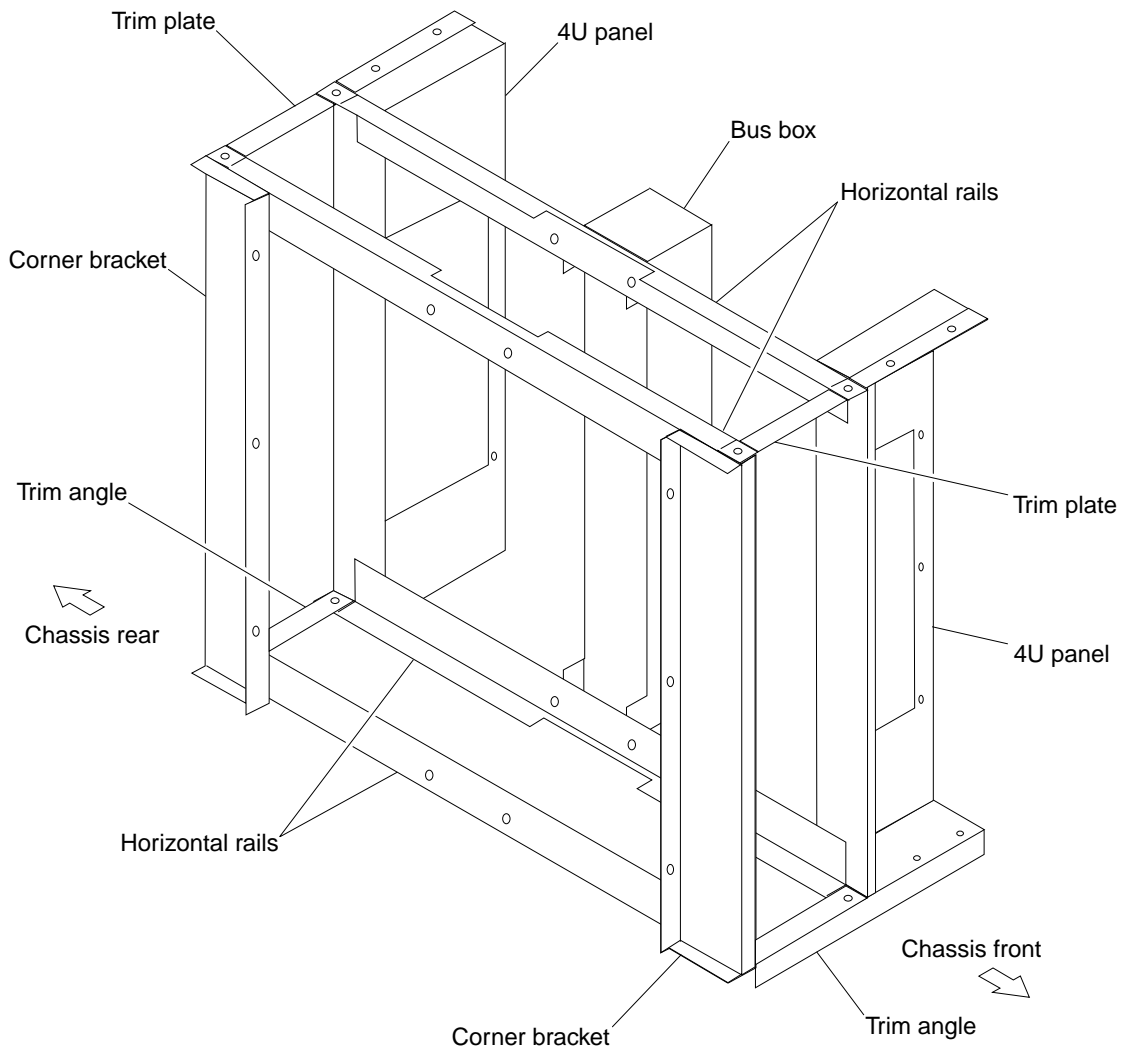
Perform the following procedures to install the rear 4U panel, brackets, rails, and trim parts (FIGURE 6).

1. **Install the rear 4U panel on the RETMA rail near the existing power shelf with three 10-32x1/2 screws in holes 8, 23, and 38 (counting from the bottom up). Leave the screws loose (FIGURE 6).**

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**Note** – The top of the 4U panel is even with the top of the existing power shelf door when it is installed correctly.

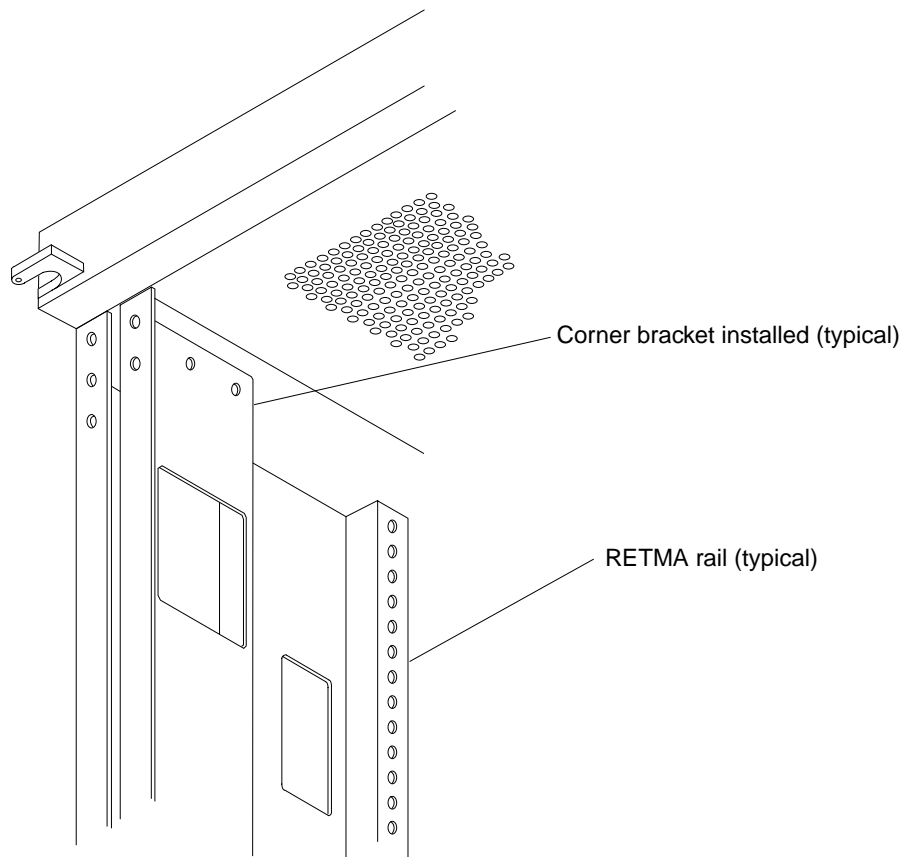
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**FIGURE 6** 4U Panel, Brackets, Rails, and Trim Parts



- 2. Install the corner bracket onto the RETMA rail opposite 4U panel with three 10-32x1/2 screws in holes 8, 23, and 38 (FIGURE 6 and FIGURE 7).**
- a. Install the first screw in hole 38 with approximately three turns. Let the bracket hang.**
  - b. Install the two remaining screws.**
  - c. Leave all three screws loose.**
- Repeat this step on the opposite side of the chassis.



**FIGURE 7** Corner Bracket Installed on RETMA Rail

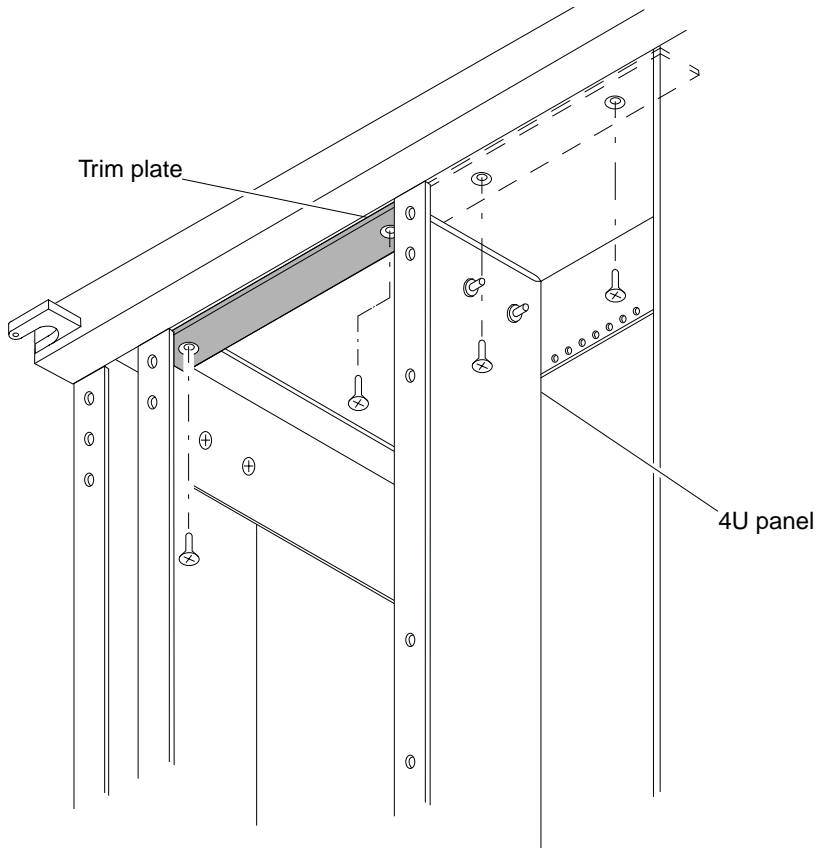
**3. Install the trim plate on one side only with two M4x10 flathead screws in the 4U panel (FIGURE 8).**

Use the trim plate to support the upper horizontal rails while they are being installed.

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**Note** – The trim plate is hidden from view above the 4U panel when installed properly.

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**FIGURE 8** Trim Plate Installation—Typical

- 4. Install two horizontal rails to the corner brackets with four M4x10 flathead screws for each horizontal rail. Leave the screws loose (FIGURE 6).**
- 5. Install two horizontal rails to the 4U panel with M4x10 flathead screws. Leave the screws loose.**

6. Install the trim angle in the correct position on the joggled flange of the horizontal rails below the 4U panel with M4x10 flathead screws. Leave the screws loose (FIGURE 9).

Repeat this step on the opposite side of the chassis.

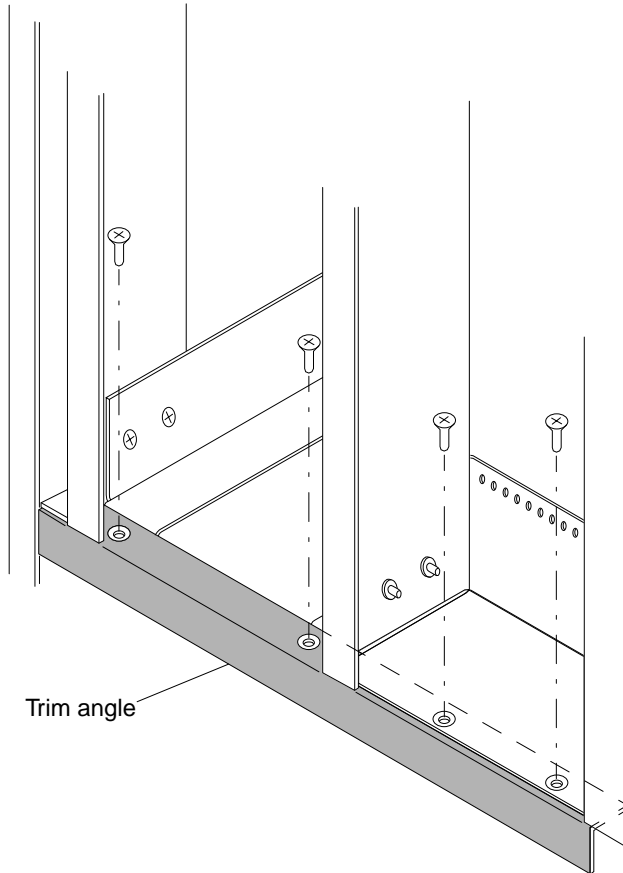
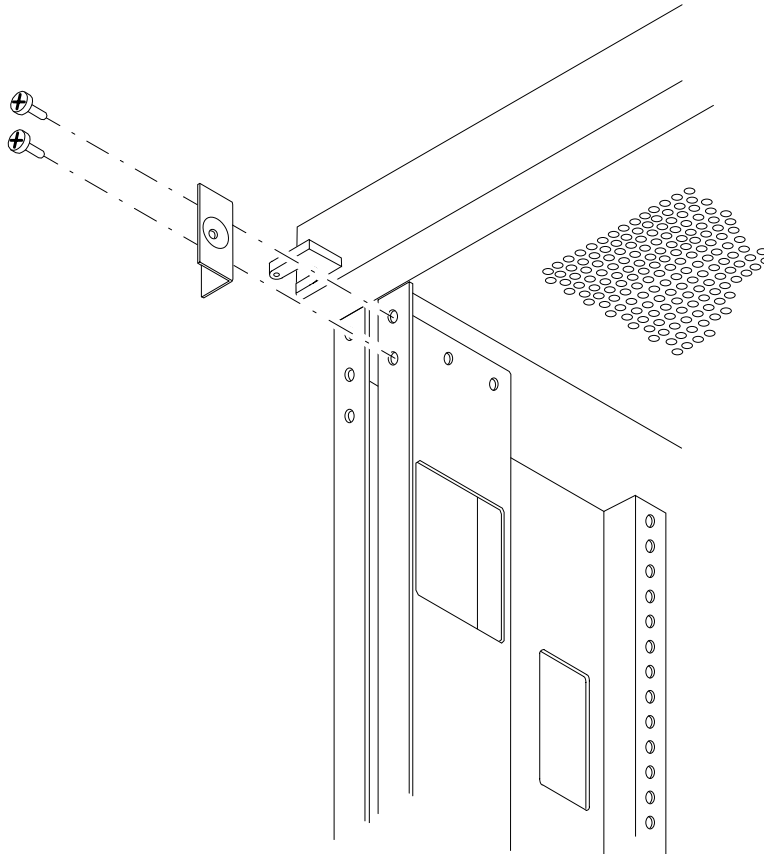


FIGURE 9 Trim Angle Installation

7. Install two M4x10 flathead screws in the remaining holes of the trim plate and the upper horizontal rails. Leave the screws loose (FIGURE 8).

Repeat this step on the opposite side of the chassis.

- 8. Transfer the top trim mount bracket from the chassis frame to the corner bracket. Use the existing fasteners and tighten them fully (FIGURE 10). Repeat this step on the opposite side of the chassis.**



**FIGURE 10** Power Shelf, Door, and Hardware Installation

- 9. Tighten all of the screws that were installed in Step 4, Step 5, Step 6, and Step 7.** Tighten the screws for the horizontal rails first then the screws for the trim plates and trim angles to keep the structure square.
- 10. Tighten all of the screws that were installed in Step 1 and Step 2.**

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# Install the Bus Box, DC Power cables, Option Power Shelves, and Remaining Data Cables

1. **Install two 10-32 screws in the PEMs on the inside upper horizontal rail with approximately three turns. See FIGURE 6 for the location of the bus box.**

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**Note** – The inside upper horizontal rail is nearest the existing power shelves.

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2. **Hang the bus box on the screws installed in Step 1.**

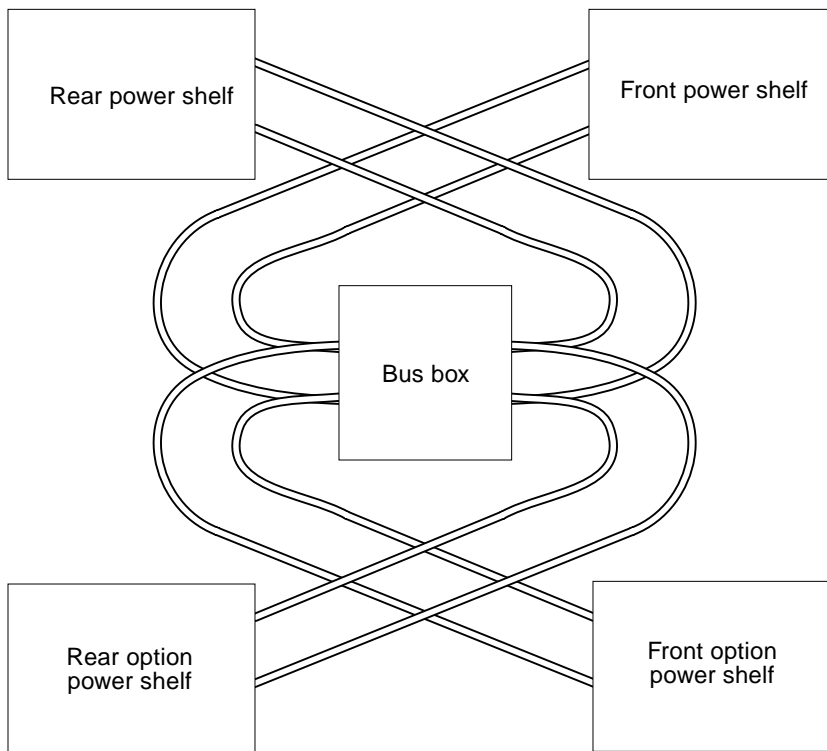
Do not tighten the screws and do not install the bottom screws at this time.

3. **Install the screws in the bottom of the bus box and the lower rail.**

Fully tighten all of the screws that attach the bus box to the horizontal rails.

4. **Connect the DC power cables from the existing power shelves to the bus box.**

Install the power cables in a criss-cross pattern, that is, front power shelf cables to rear facing connectors of the bus box and so on. Install the inner connectors first and proceed outward. Route the red (positive) cables above the horizontal rail and the black (negative) cables below the horizontal rail (FIGURE 11).



**FIGURE 11** Criss-Cross Method of Installing Power Cables

- 5. Install labels “POWER GRID B” to the side of the option power shelves so that the labels are visible when the inside of the chassis is viewed from the front or back.**

Install the labels in a similar position as on the existing power shelves (FIGURE 1).

- 6. Install the option power shelf in the front of the chassis with the AC input module toward the outside of the chassis so that it is a mirror image to the power shelf next to it.**

Install one screw in the lower hole of the outer flange. Do not install the other screws at this time.

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**Note** – Only one screw is installed to secure the power shelf while cables are being attached.

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7. **Attach the (black) DC power cables to the lower horizontal connectors J9 and J10 on the front power shelf (FIGURE 12).**
  - a. **Install the outer connectors first then the inner connectors.**
  - b. **Route the black cables below the horizontal rail.**
8. **Attach the straight connector ends of the (red) DC power cables to the upper horizontal connectors J1 and J2 on the front power shelf (FIGURE 12).**
  - a. **Install the outer connectors first then the inner connectors.**
  - b. **Route the red cables above the horizontal rail.**
9. **Attach the DC power cables from the front option power shelf to the bus box.**

Use the criss-cross method described in Step 4.

  - a. **Attach the angled connectors of the red cables to the upper (+) connectors.**
  - b. **Attach the straight connectors of the black cables to the lower (-) connectors.**
10. **Connect two data cables to the front option power shelf.**
  - a. **Attach the data cable from the status module tray labeled “B: FRONT J11” to J11 on the back of the front option power shelf.**
  - b. **Attach the data cable from the status module tray labeled “B: FRONT J12” to J12 on the back of the front option power shelf (FIGURE 12).**
11. **Install the DC power cables on the remaining rear power shelf before the power shelf is installed.**
  - a. **Attach the (black) DC power cables to the lower horizontal connectors J9 and J10.**
  - b. **Attach the straight connector ends of the (red) DC power cables to the upper horizontal connectors J1 and J2.**
12. **Install the rear option power shelf in the chassis.**

Make sure that the DC power cables are not crimped or damaged. Do not fasten the power shelf with screws at this time.

  - a. **Route the black cables below the horizontal rail.**
  - b. **Route the red cables above the horizontal rail.**
  - c. **Allow the connectors to hang free until the data cables are attached.**

**13. Connect the two remaining data cables to the rear option power shelf.**

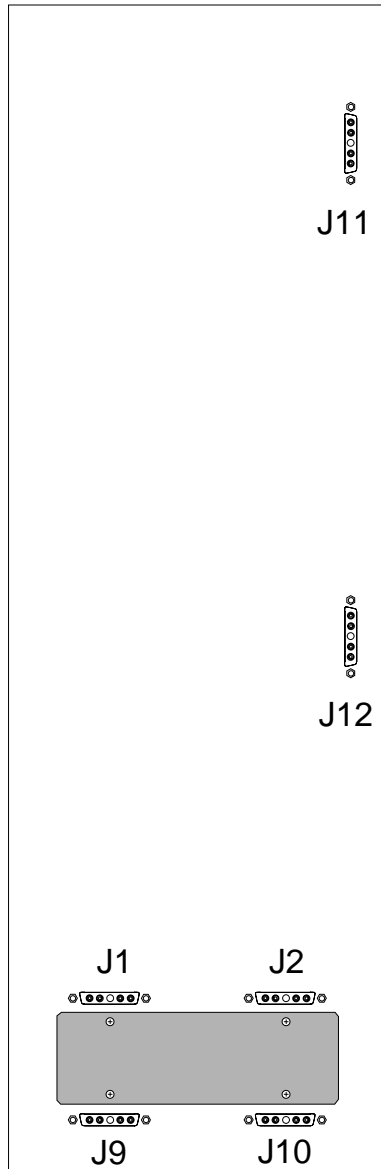
Position the power shelf as necessary to permit visibility and access to the connectors J11 and J12.

- a. **Attach the data cable from the status module tray labeled “B: REAR J11” to J11 on the back of the rear option power shelf.**
- b. **Attach the data cable from the status module tray labeled “B: REAR J12” to J12 on the back of the rear option power shelf.**

**14. Attach the four remaining power cables to the bus box.**

Use the criss-cross method described in Step 4 and attach the connectors as described in Step 9.





**FIGURE 12** Back of Option Power Shelf—Typical

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# Verify the Cable Installation

Verify that the power and data cables are installed and connected correctly.

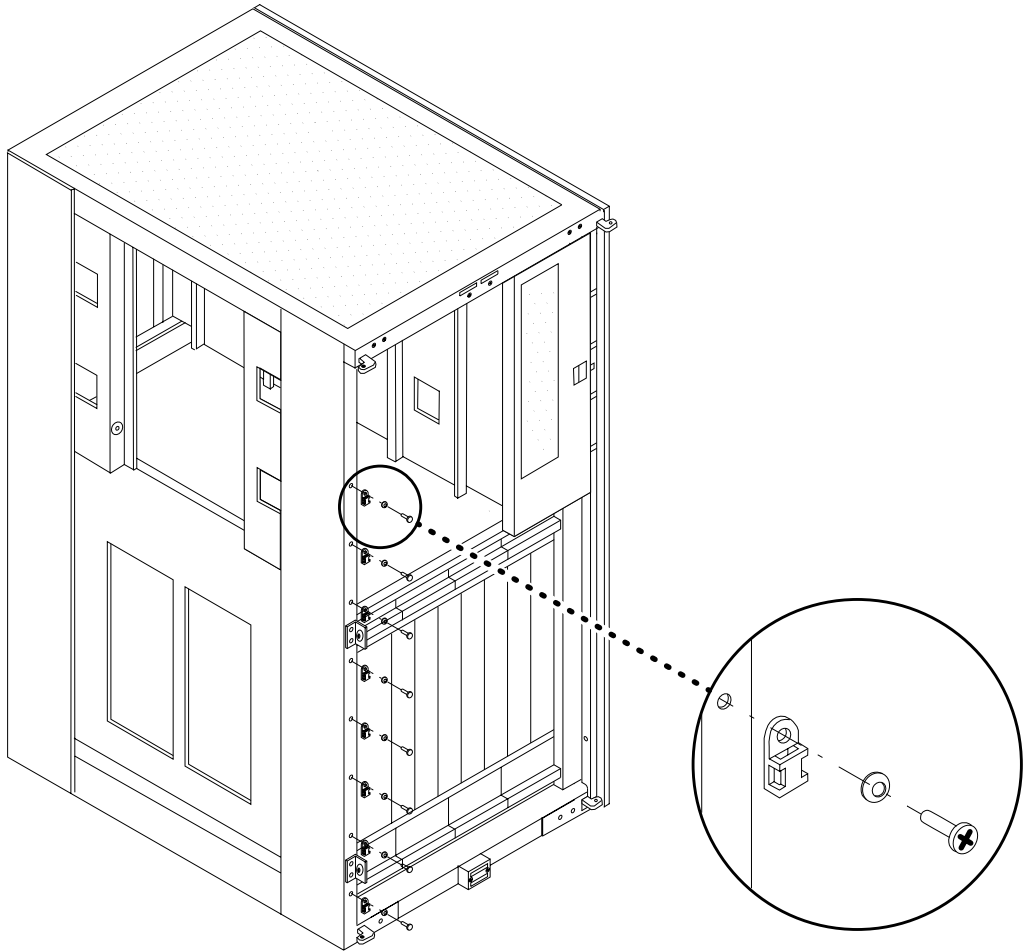
- 1. Make sure that the red (positive) power cables connect to the top (+) group of bus box connectors.**
- 2. Make sure that the black (negative) power cables connect to the bottom (-) group of bus box connectors.**
- 3. Make sure that all data cables are connected and tightened.**

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# Install the Power Shelf Doors, AC Input Modules, Power Supplies, Power Cables, and Trim Channels.

- 1. Install cable anchors in eight places on the front of the chassis and eight places on the rear of the chassis (FIGURE 13).**

Fasten each cable anchor with a M4x10 screw and cone washer.



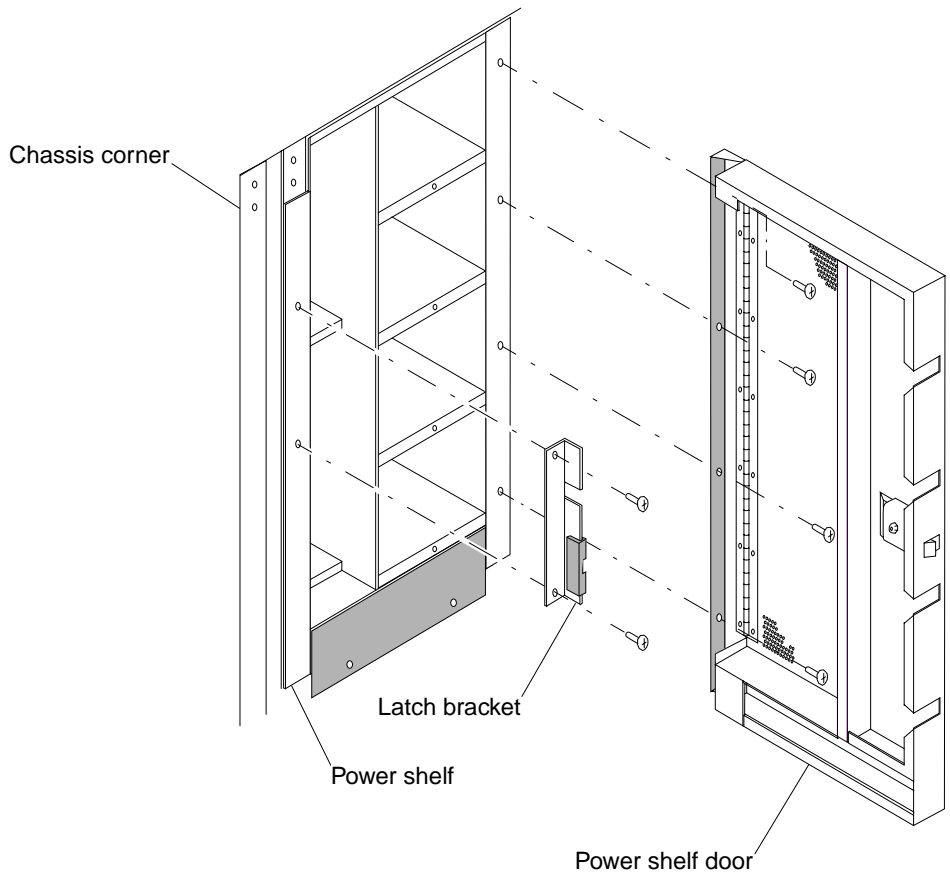
**FIGURE 13** Cable Anchor Installation—Typical

**2. Install the latch bracket toward the outside and fasten it with M4 screws.**  
(FIGURE 14).

**3. Install the power shelf door with M4 screws so that it is a mirror image of the door next to it** (FIGURE 14).

Adjust the door and/or the latch bracket as necessary to allow correct latching action. Tighten the screws fully.

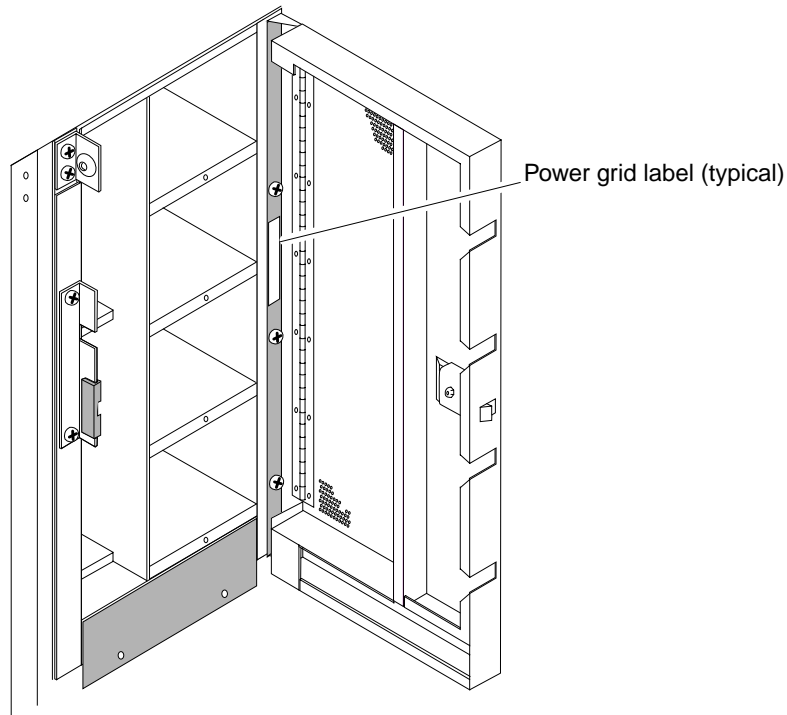
**4. Install the remaining screws in the power shelves. Tighten them fully.**



**FIGURE 14** Install Power Shelf Door—Typical

5. **Install the power grid labels to the front, hinge side of all power shelves so that they are visible when the door is open (FIGURE 15).**

Install the “POWER GRID A” labels to the existing power shelves and “POWER GRID B” labels to the option shelves.



**FIGURE 15** Power Grid Label on Power Shelf

6. **Install four AC Input Modules (ACIM) in the power shelves.**

Insert the ACIMs fully and carefully so that the EMI gaskets on the sides of the ACIMs are not damaged. Tighten the 1/4 turn captive fasteners on the ACIMs.

7. **Insert the power supplies fully and tighten the 1/4 turn captive fasteners.**

8. Attach the “B Power Grid” labels from the label set to all four AC power supply cable assemblies (FIGURE 16).
  - a. Attach the individual label to some spare backing paper.
  - b. Attach the clear adhesive over the label so that the white tab does not obscure any part of the label.
  - c. Remove the assembled label from the backing paper and attach it to the correct position on the cable assembly.

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**Note** – “A Power Grid” labels are also provided and may be applied to the existing four AC power supply cable assemblies in the same location as shown for “B Power Grid” in FIGURE 16.

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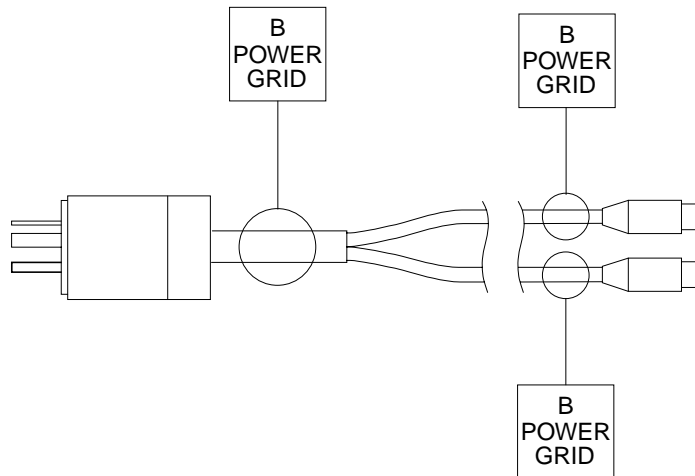
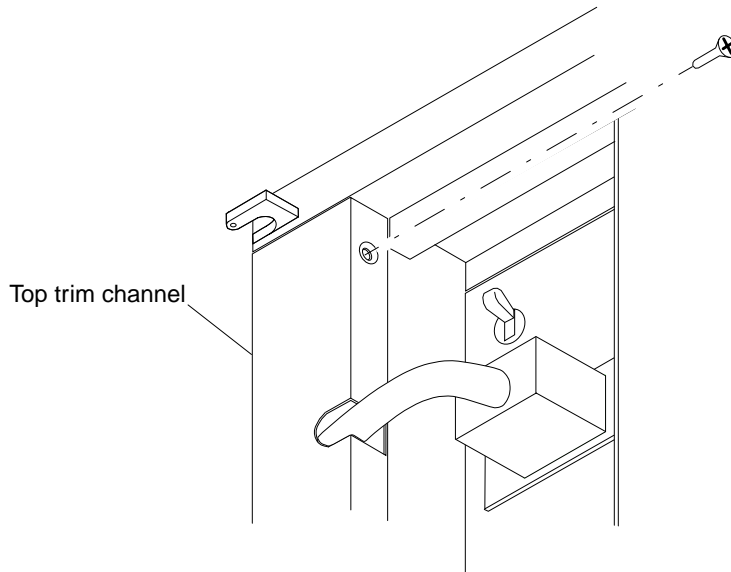


FIGURE 16 AC Power Supply Cable Assembly Labels

9. **Connect the AC power supply cables to the ACIMs in the front and the rear of the chassis.**
10. **Fasten the AC power supply cables to the cable anchors in the front of the chassis.**  
Leave enough slack in the upper ends of the cables to route them through the appropriate slots in the top trim channel. Use cable ties to securely fasten the cables to the cable anchors installed in Step 1.
11. **Install the top left trim channel in the front of the chassis (FIGURE 17).**
  - a. **Route the AC power supply cables through the appropriate slots and attach the top trim channel with a black M5 screw tightened fully.**
  - b. **Remove the upper power supply cable connector from the ACIM to permit easier installation of the screw.**

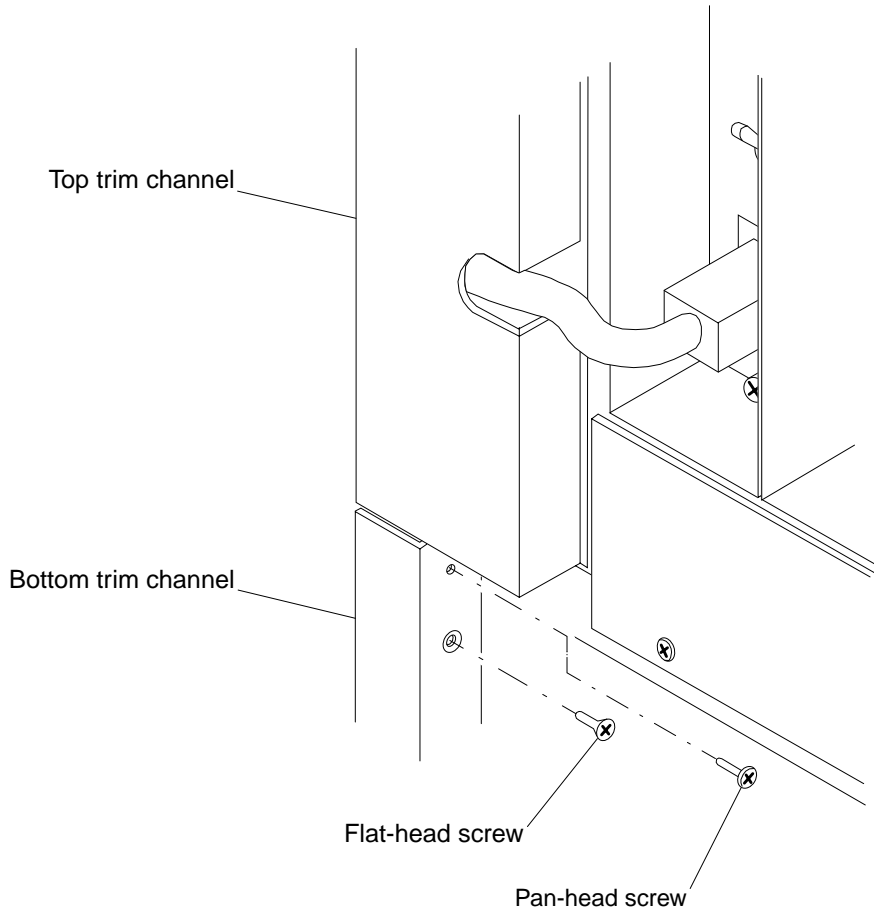


**FIGURE 17** Top Trim Channel Installation



**12. Install the bottom left trim channel in the front of the chassis (FIGURE 18).**

Make sure the AC power supply cables are routed inside the trim channel. Attach the trim channel at the top with one black flat-head M5 screw and one M4 screw and at the bottom with one black flat-head M5 screw.



**FIGURE 18** Bottom Trim Channel Installation

**13. Fasten the AC power supply cables to the cable anchors in the rear of the chassis.**

Fasten the cables as described in Step 10.

**14. Install the top right and the bottom right trim channels on the rear of the chassis as described in Step 11 and Step 12.**

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# Install the Status Modules, AC Sequencer, and Hub

Install the status modules, AC sequencer, and hub in the front 4U panel (FIGURE 19).

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**Note** – If AC sequencers and hubs are mounted in external racks or cabinets, then blank panels are installed in their place on the 4U panel as described in “Alternate 4U Panel Installation”.

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- 1. Install four status modules in the previously installed status module tray.**  
Push the status module in firmly to engage the connector on the back of the module. Press in and fully tighten the thumbscrew.
- 2. Install the adhesive overlay.**  
Make sure the overlay is aligned correctly and clear of any mounting screws. Press firmly and make sure that air bubbles are worked out.
- 3. Connect one end of the AC line cord into J6 on the rear panel of the AC sequencer.**
- 4. Install the AC sequencer next to the status module tray assembly in the 4U panel.**  
Install the bottom of the AC sequencer first then swing the top into position. Fasten the AC sequencer with four 10-32 screws and tighten them fully.
- 5. Attach the free end of the ground cable to the front of the AC sequencer with a M5x12 screw.**
- 6. Connect the free end of the AC line cord to the connector on the rear of the hub.**
- 7. Install the hub in the 4U panel. Make sure the RJ-45 connectors are oriented toward the lower half as shown in FIGURE 19.**
- 8. Fasten the hub with 10-32 screws and tighten them fully.**

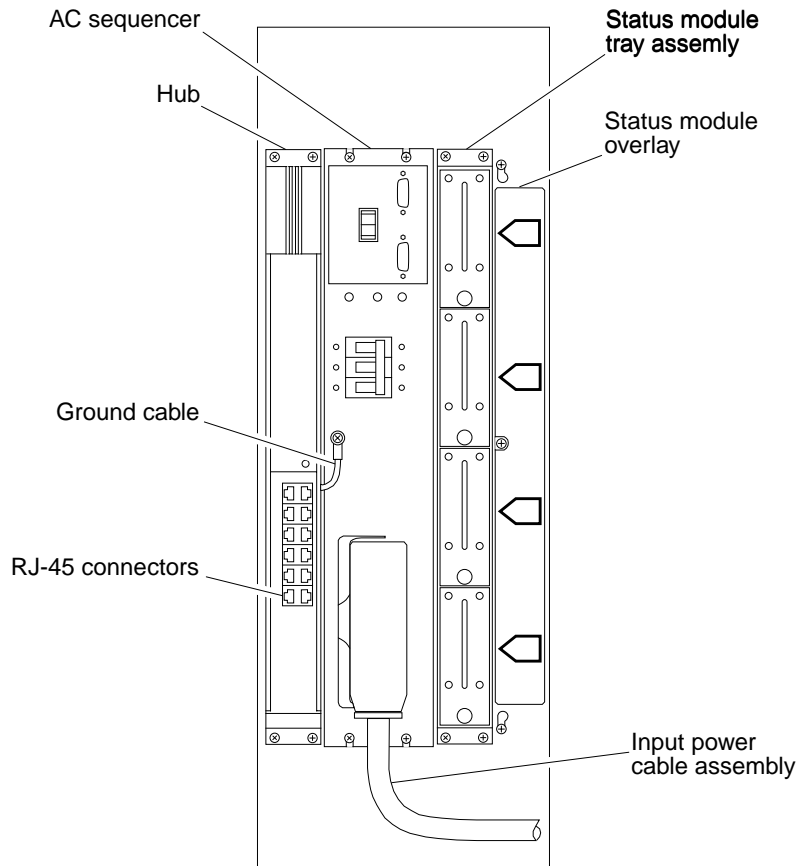
**9. Install the AC input power cable in the AC sequencer.**

- a. Route the cable down the chassis side wall.**
- b. Fasten the cable with the cable ties in the lanced loops of the chassis structure.**
- c. Fasten the cable at the bottom with a cable clamp using an available M4 tapped hole (FIGURE 20).**

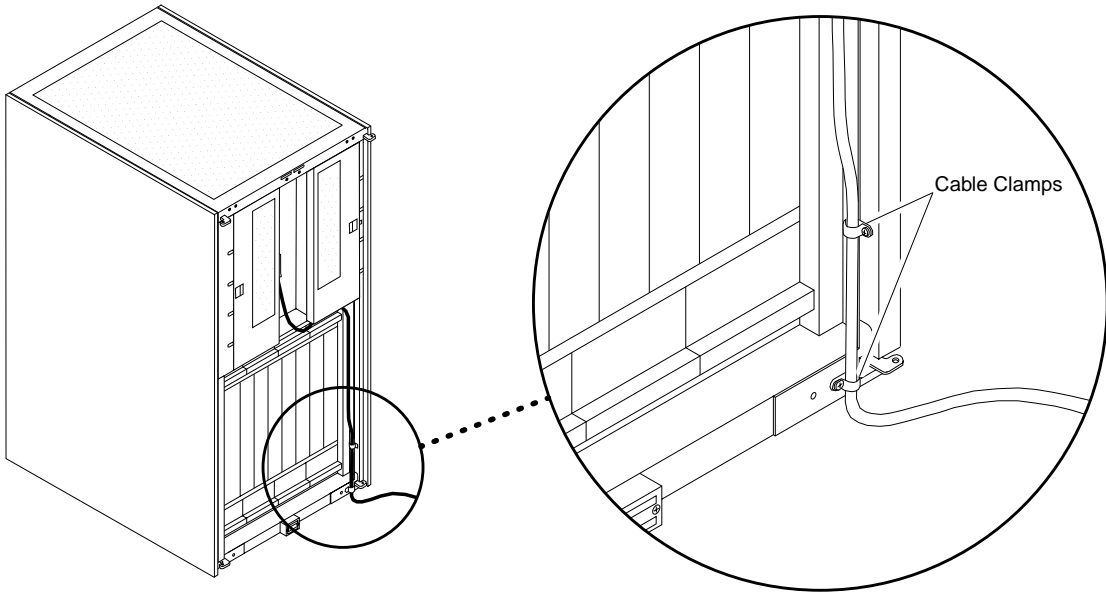
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**Note** – The front and rear AC sequencers should not be connected to the same power grid.

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**FIGURE 19** Equipment Installation in the Front 4U Panel



**FIGURE 20** AC Sequencer Cable Location—Typical

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# Install the Rear AC Sequencer, Hub, and Remote Power Control Module Shelf

Install the AC sequencer, hub, and RPCM in the rear 4U panel (See FIGURE 21).

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**Note** – If AC sequencers and hubs are mounted in external racks or cabinets then blank panels are installed in their place on the 4U panel as described in “Alternate 4U Panel Installation”.

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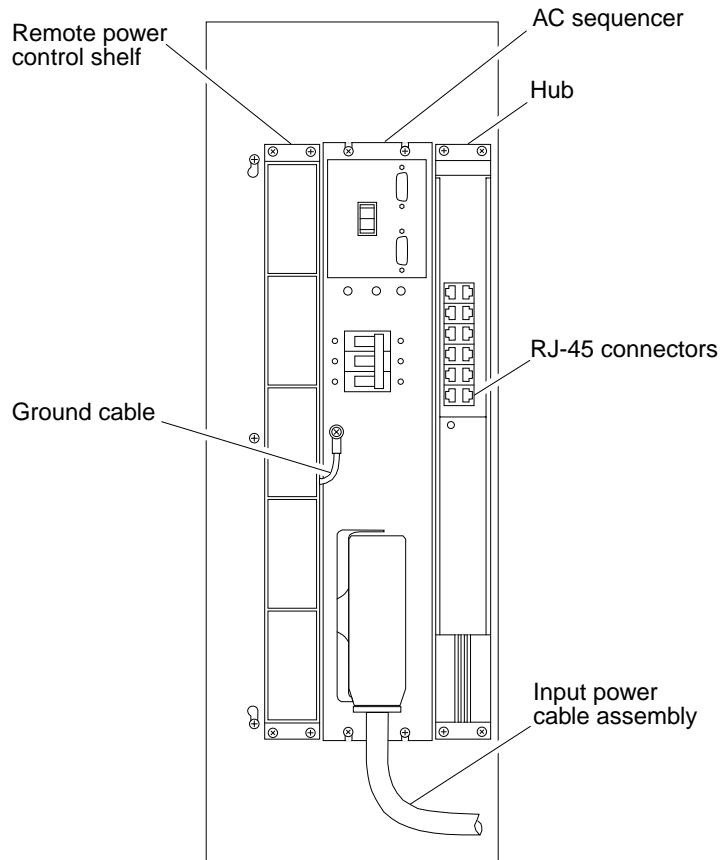
- 1. Connect the one end of the AC line cord to the connector on the rear of the hub.**  
Make sure the RJ-45 connectors are oriented toward the upper half as shown in FIGURE 21.
- 2. Install the hub all the way to the right in the 4U panel.**  
Fasten the hub with 10-32 screws and tighten them fully.
- 3. Retrieve the loose end of the ground cable and let it hang out of the 4U panel.**
- 4. Connect the free end of the AC line cord into J6 on the rear panel of the AC sequencer.**
- 5. Install the AC sequencer next to the hub.**  
Install the bottom of the AC sequencer first then swing the top into position. Fasten the AC sequencer with four 10-32 screws and tighten them fully.
- 6. Attach the free end of the ground cable to the front of the AC sequencer with a M5x12 screw.**
- 7. Install the RPCM shelf in the 4U panel.**  
Fasten the RPCM shelf with 10-32 screws and tighten them fully.
- 8. Install the RPCMs in the RPCM shelf.**

9. Install the AC input power cable in the AC sequencer.
  - a. Route the cable down the chassis side wall.
  - b. Fasten the cable with the cable ties in the lanced loops of the chassis structure.
  - c. Fasten the cable at the bottom with a cable clamp using an available M4 tapped hole (FIGURE 20).

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**Note** – The front and rear AC sequencers should not be connected to the same power grid.

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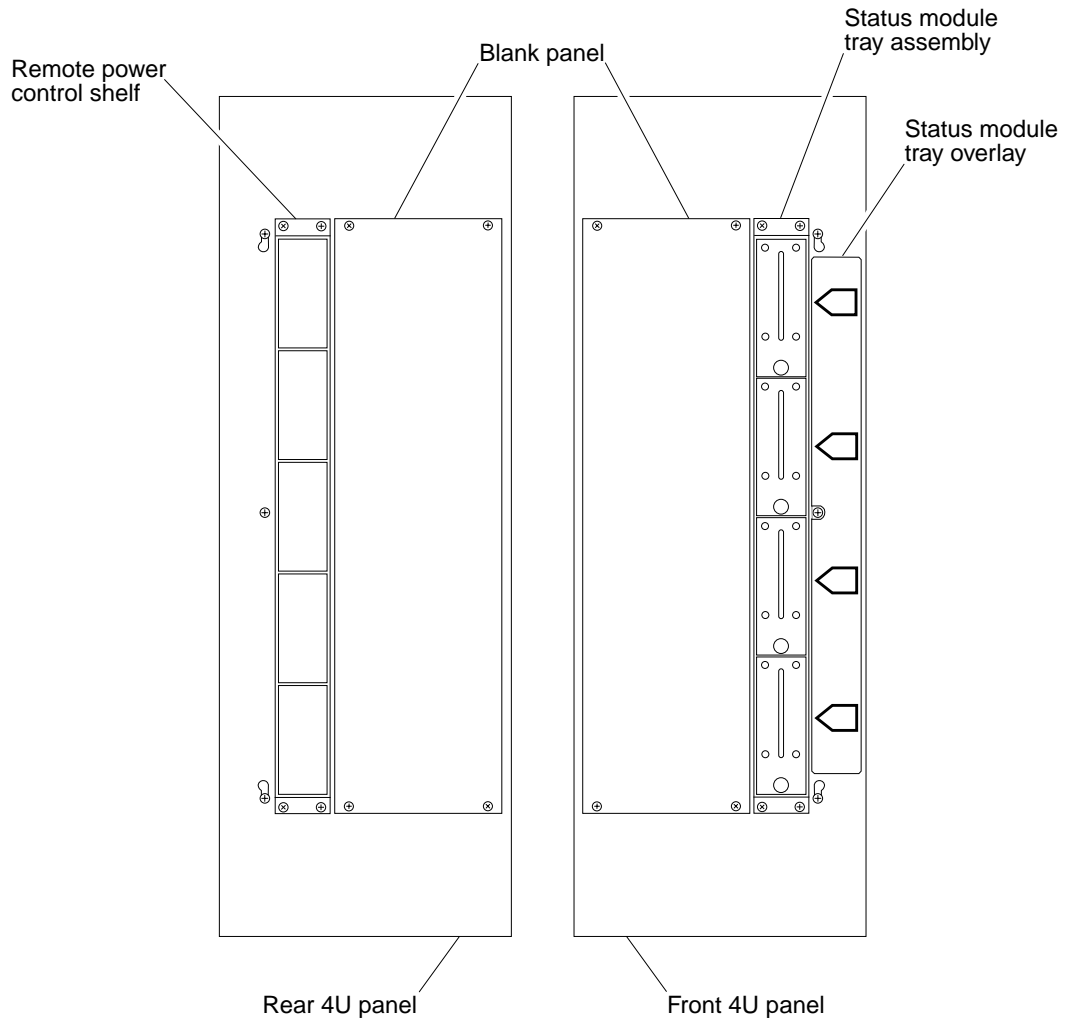
**FIGURE 21** Equipment Installation in the Rear 4U Panel

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## Alternate 4U Panel Installation

If AC sequencers and hubs are mounted in external racks or cabinets then blank panels are installed in their place on the 4U panel. Perform the following procedures to install the status module tray assembly, remote power control shelf, and blank panels (FIGURE 22).

- 1. Install the status module tray all the way to the right side of the front 4U panel.**  
Fasten the status module tray assembly with four 10-32 screws and tighten them fully.
- 2. Install four status modules in the status module tray assembly.**  
Push the status module in firmly to engage the connector on the back of the module. Press in and fully tighten the thumbscrew.
- 3. Install the adhesive overlay.**  
Make sure the overlay is aligned correctly and clear of any mounting screws. Press firmly and make sure that air bubbles are worked out.
- 4. Install the blank panel with four 10-32 screws.**
- 5. Install the RPCM shelf in the rear 4U panel.**  
Fasten the RPCM shelf with 10-32 screws and tighten them fully.
- 6. Install the RPCMs in the RPCM shelf.**
- 7. Install the blank panel with four 10-32 screws.**



**FIGURE 22** Alternate 4U Panel Installations



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# Close the Chassis and Apply Power

1. **Install all doors and chassis covers on the chassis.**
2. **Turn on all switches and circuit breakers.**
3. **Make sure that the ACIM DC ON LEDs are green and all others are amber.**
4. **Verify that the Hostview display on the SSP indicates green for the control boards and green for the Grid A power supplies.**

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**Note** – Future SSP revisions will indicate the status of Grid B power supplies.

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