Paragon™
System

PARAGON
intel

Hardware
Installation Manual

Paragon™ System

Hardware Installation

Manual

Intel® Corporation

WARNING

Some of the circuitry inside this system operates at hazardous energy and electric shock voltage levels. To avoid the risk of personal injury due to contact with an energy hazard, or risk of electric shock, do not enter any portion of this system unless it is intended to be accessible without the use of a tool. The areas that are considered accessible are the outer enclosure and the area just inside the front door when all of the front panels are installed, and the front of the diagnostic station. There are no user serviceable areas inside the system. Refer any need for such access only to technical personnel that have been qualified by Intel Corporation.

CAUTION

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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Preface

Introduction

This manual explains how to install a Paragon™ XP/S supercomputer system. By following the procedures in this manual, the system will be installed quickly and efficiently.

CAUTION

This manual is intended to be used by Intel Scalable Systems Division (SSD) Integration Engineers and Customer Support Engineers. The Paragon supercomputer should only be installed by people who have completed the SSD Customer Engineer training course.

Organization

This manual contains the following information:

Chapter 1   Describes the overall installation strategy and lists the tools you need to complete the installation.

Chapter 2   Tells how to unpack, inventory, and position the system prior to installation.

Chapter 3   Tells how to install the system cabinets.

Chapter 4   Tells how to apply power to the system.

Notational Conventions

This manual uses the following notational conventions:

Bold   Identifies command names and switches, system call names, reserved words, and other items that must be used exactly as shown.

Italic   Identifies variables, filenames, directories, processes, user names, and writer annotations in examples. Italic type style is also occasionally used to emphasize a word or phrase.

`Plain-Monospace`
            Identifies computer output (prompts and messages), examples, and values of variables. Some examples contain annotations that describe specific parts of the example. These annotations (which are not part of the example code or session) appear in *italic* type style and flush with the right margin.

Bold-Italic-Monospace
            Identifies user input (what you enter in response to some prompt).

`Bold-Monospace`
            Identifies the names of keyboard keys (which are also enclosed in angle brackets). A dash indicates that the key preceding the dash is to be held down *while* the key following the dash is pressed. For example:

            <Break>   <s>   <Ctrl-Alt-Del>

[   ]   (Brackets) Surround optional items.

. . .   (Ellipsis dots) Indicate that the preceding item may be repeated.

| (Bar) Separates two or more items of which you may select only one.

{   }   (Braces) Surround two or more items of which you must select one.

Applicable Documents

For more information about installing the Paragon XP/S System system, refer to the following manuals.

Paragon™ *System Site Preparation Guide*
> Describes the necessary tasks that must be completed at the installation site before a successful installation can be made.

Paragon™ *System Acceptance Test User's Guide*
> Describes the Paragon system acceptance test (SAT) and the **sat** command.

Paragon™ *System User's Guide*
> Describes the operating system operating system. Tells how to develop and run programs.

Paragon™ *System Technical Documentation Guide*
> Describes the technical documentation for the Paragon system.

Comments and Assistance

Intel Scalable Systems Division is eager to hear of your experiences with our products. Please call us if you need assistance, have questions, or otherwise want to comment on your Paragon system.

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Introduction 1

The Installation Process

This chapter introduces the process of installing a Paragon™ XP/S system. There are three basic steps in the installation process:

1. Unpack the shipping crates, inventory the items received, and inspect the crates for damage.

2. Install the system cabinets.

3. Apply power to the system and ensure that it is operating correctly.

These subjects are discussed in Chapters 2, 3, and 4, respectively. Figure 1-1 on page 1-2 depicts the installation process.

Unpack, Inventory, and Inspect
Shipping Crates.
(Chapter 2)

Install System Cabinets.
(Chapter 3)

Apply Power to the System.
(Chapter 4)

System Powers
Up Successfully?

NO → Contact SSD
Customer Support.

YES

Hardware Installation Complete.
Proceed to Software
Installation Instructions.
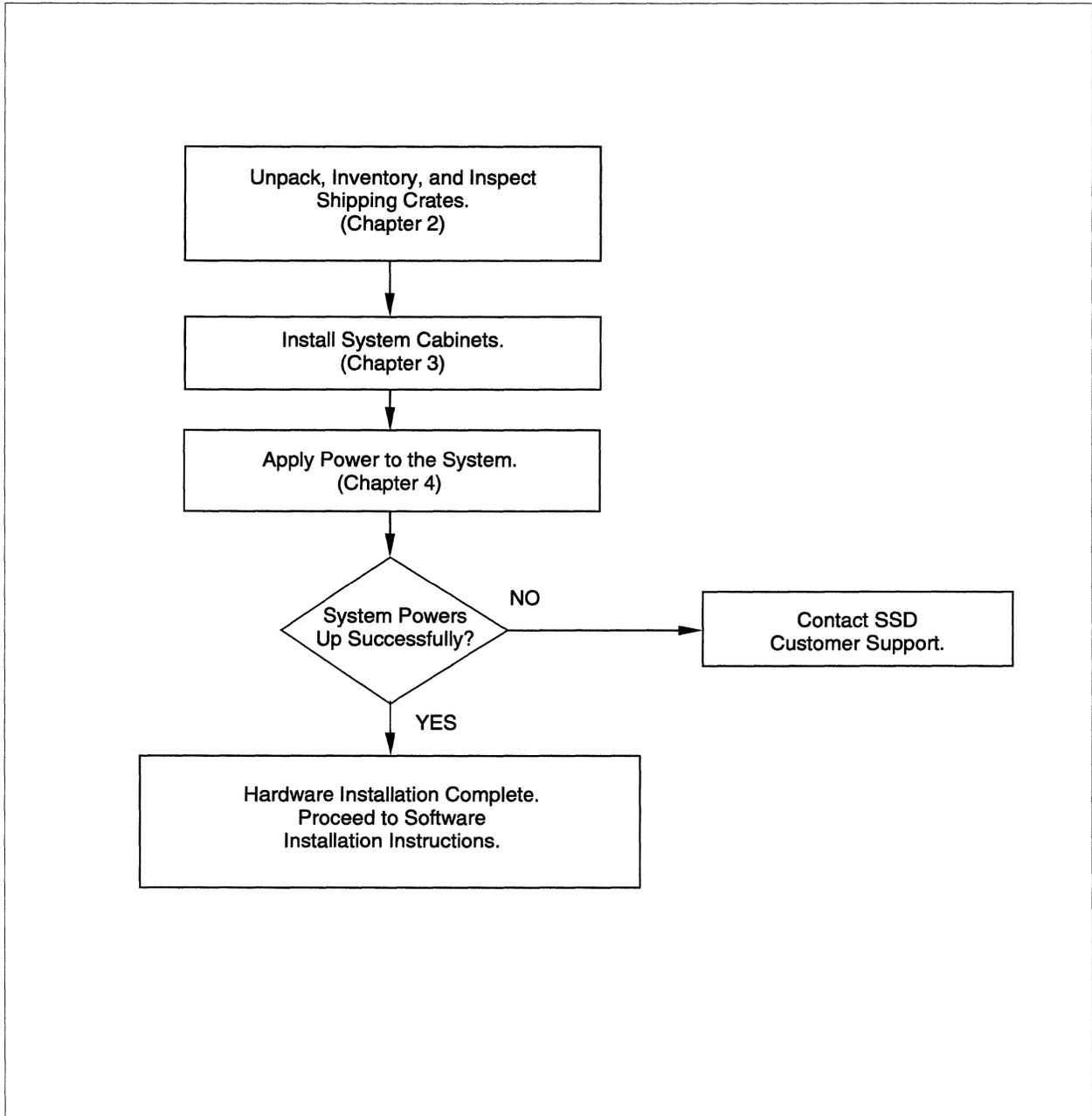
Figure 1-1. Paragon™ XP/S Installation Process
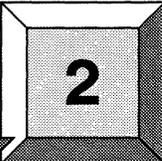
Unpack the System 2

Introduction

This chapter tells you how to unpack the shipping crates, inventory the items received, and inspect the crates for damage.

NOTE

The Paragon™ XP/S system cabinets might be shipped in either wooden or cardboard crates. The current shipping crates are wooden; the new crates are triple-wall cardboard that provides greater cushioning and protection than the wooden crates. Whichever type of shipping *crates* you receive, you might also receive some cardboard *containers* that are shipped inside the crates (or separately, as required).

Inventory the Shipment

Before unpacking, you should make sure that all the shipping crates and containers have arrived.

Wooden Crate Procedure

A system shipped using wooden crates should include the following:

* Cabinet crates: one for each system cabinet you ordered.

* Support crate: disk drives, cables, spares, and other miscellaneous items.

* Accessories containers: miscellaneous hardware, if the support crate is full.

- System software and documentation containers (these items might be in the support crate if room allows).

If it appears that you did not receive everything, contact SSD Customer Support.

Cardboard Crate Procedure

A system shipped using cardboard crates should include the same things as above, except that the support crate contains no disk drives (because the cardboard crates offer enough protection to allow shipment with the drives preinstalled in the system cabinets).

Inspect the Shipping Crates and Containers

Inspect the shipping crates and containers for visible signs of damage. If the freight bill for the system was signed without noting shipping container damage, you should write down the extent and type of any damage. Use this information later if a claim must be filed.

Follow these guidelines:

Damage   If the equipment is visibly damaged, the claim *must* be filed with the carrier who delivered the equipment.

Malfunction   If the equipment is not visibly damaged but does not work, contact SSD Customer Support.

Before You Unpack

There are several things to do before you unpack the system:

1. Review the layout plan with the customer and verify that the required electrical, environmental, and mechanical specifications for setting up the system have been satisfied. Refer to the *Paragon™ System Site Preparation Guide* for more information.

2. Move the crates and containers to an open area with adequate room to unpack the equipment.

3. Make sure you have the following tools on hand:

   - 9/16-inch or 15mm open-ended or socket wrench.

   - A power driver (highly recommended) for uncrating the system and connecting multiple-cabinet systems.

   - Small cutters for tie-wraps.

- Masking tape.

- Felt-tip marker.

Unpack the Cabinet Crates

The next step is to unpack the system cabinet crates. Follow the procedure for the type of crates you received (wooden or cardboard).

Wooden Crate Procedure

Use this procedure to unpack system cabinets shipped in wooden crates. If you have a multi-cabinet system, the procedure applies to each cabinet.

Each cabinet is enclosed in a wooden crate. See Figure 2-1.
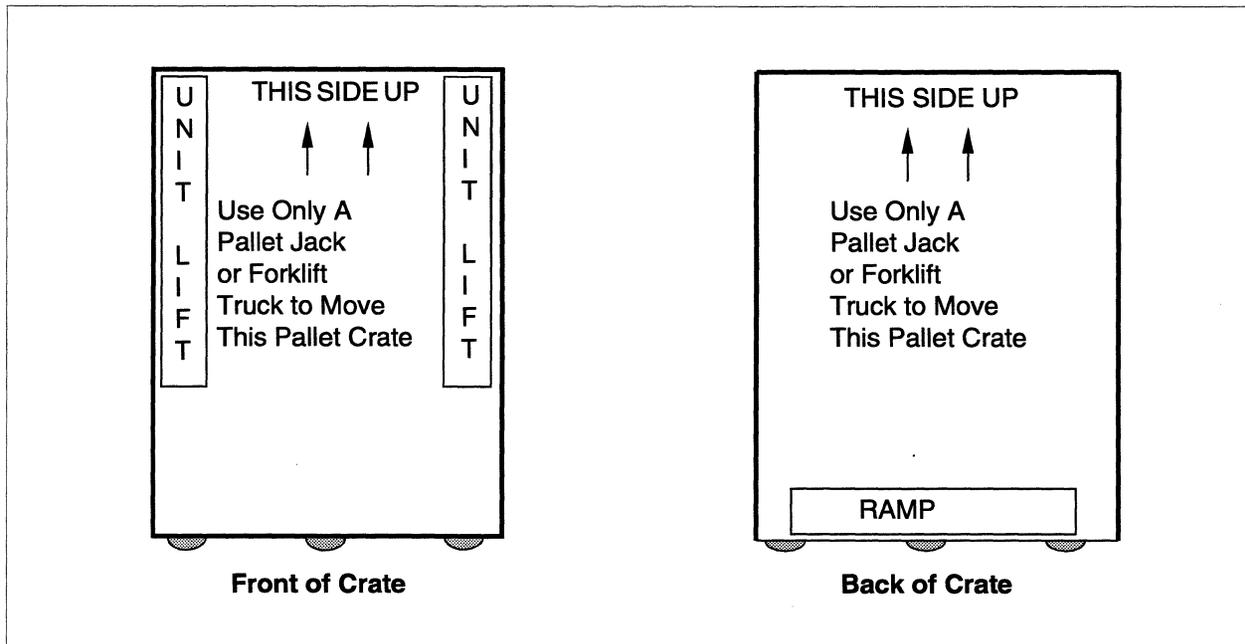
Figure 2-1. Wooden Shipping Crate

NOTE

This procedure suggests that you reinstall bolts in the holes from which they were removed or tag the bolts for later identification. Following this suggestion will reduce the time required to reassemble the shipping crate.

Follow these steps to unpack each cabinet:

1. Position the crate so that you have easy access to its top and sides.

2. Remove the bolt from the top front of the crate (Figure 2-2 on page 2-5). Tape this bolt to the top of the crate or mark it for identification.

3. Remove the two bolts from the bottom left-hand side of the crate.

4. Turn the bolts over and reinsert them, *from the bottom*, in the holes from which they were removed. When you reinsert the bolts, you only need to turn them a few turns.

5. Repeat steps 3 and 4 for the two bolts on the bottom right-hand side of the crate (Figure 2-2 on page 2-5).

6. At the back of the crate, remove the two bolts that secure the ramp end (marked "Ramp"). Lay the ramp end aside (Figure 2-3 on page 2-6).

7. Turn the bolts over and reinsert them, *from the bottom*, in the holes from which they were removed.

8. Remove the two bolts from the bottom edge of the back of the crate (Figure 2-3).

9. Turn the bolts over and reinsert them, *from the bottom*, in the holes from which they were removed.

10. Remove the six bolts that secure the front panel of the crate (Figure 2-4 on page 2-7).

11. Carefully remove the front panel and lower it to the floor. The unit lifts (bolted to the front panel) should be against the floor.

12. Reinsert the front panel bolts *in the back side* of the screw holes in the crate.

Remove bolt and
tape it to top of
crate

Front of Crate

Right side of
crate

Left side of
crate

Remove bolts
from here...

Reinsert bolts
below (a few turns)

Remove Bolts
from here...

Reinsert bolts
below (a few turns)
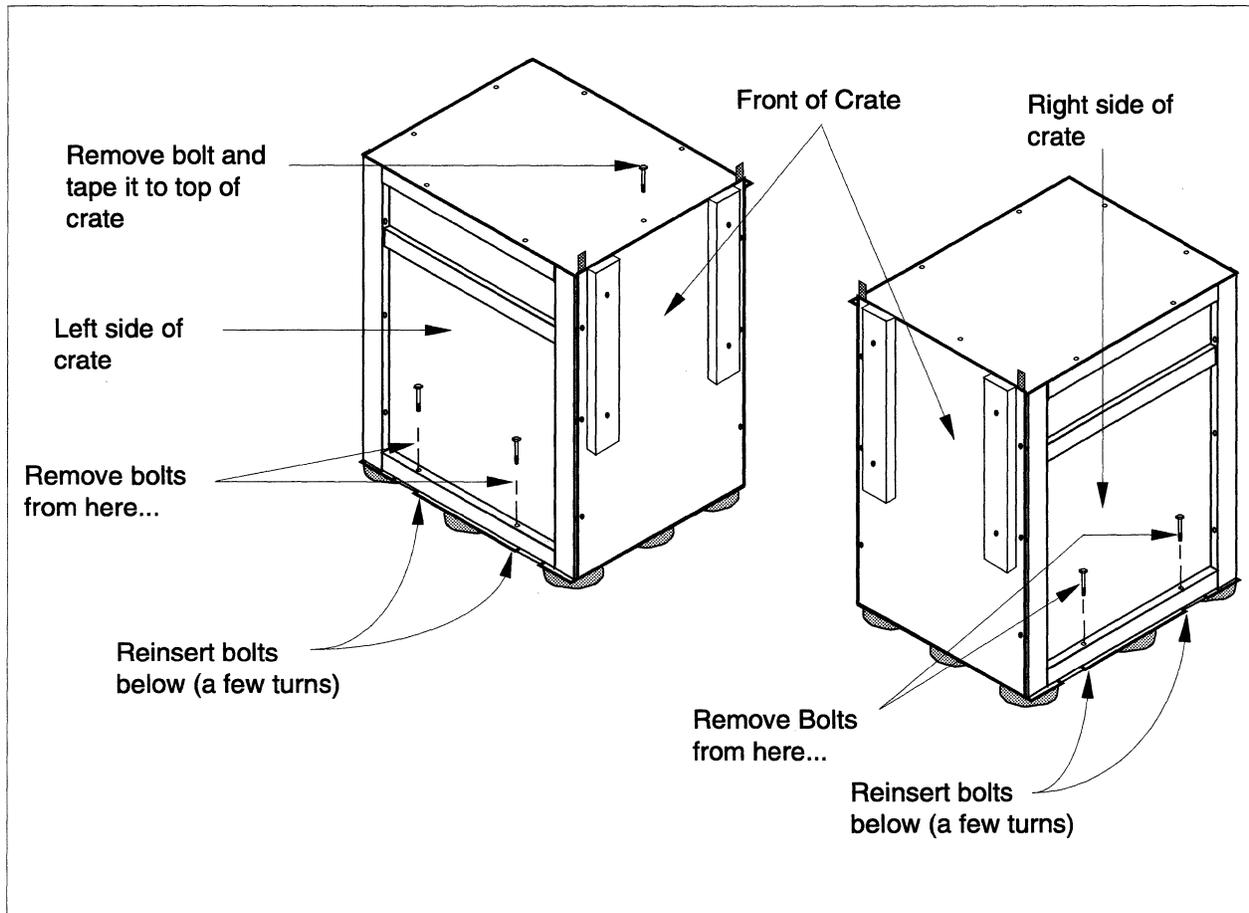
Figure 2-2. Remove Top and Side Bolts from Wooden Shipping Crate

Back of crate

Reinsert bolts from
ramp end here

"RAMP"
(ramp end)

Remove bolts
from here...

Remove bolts
that secure
the ramp end

Reinsert bolts here
(a few turns)
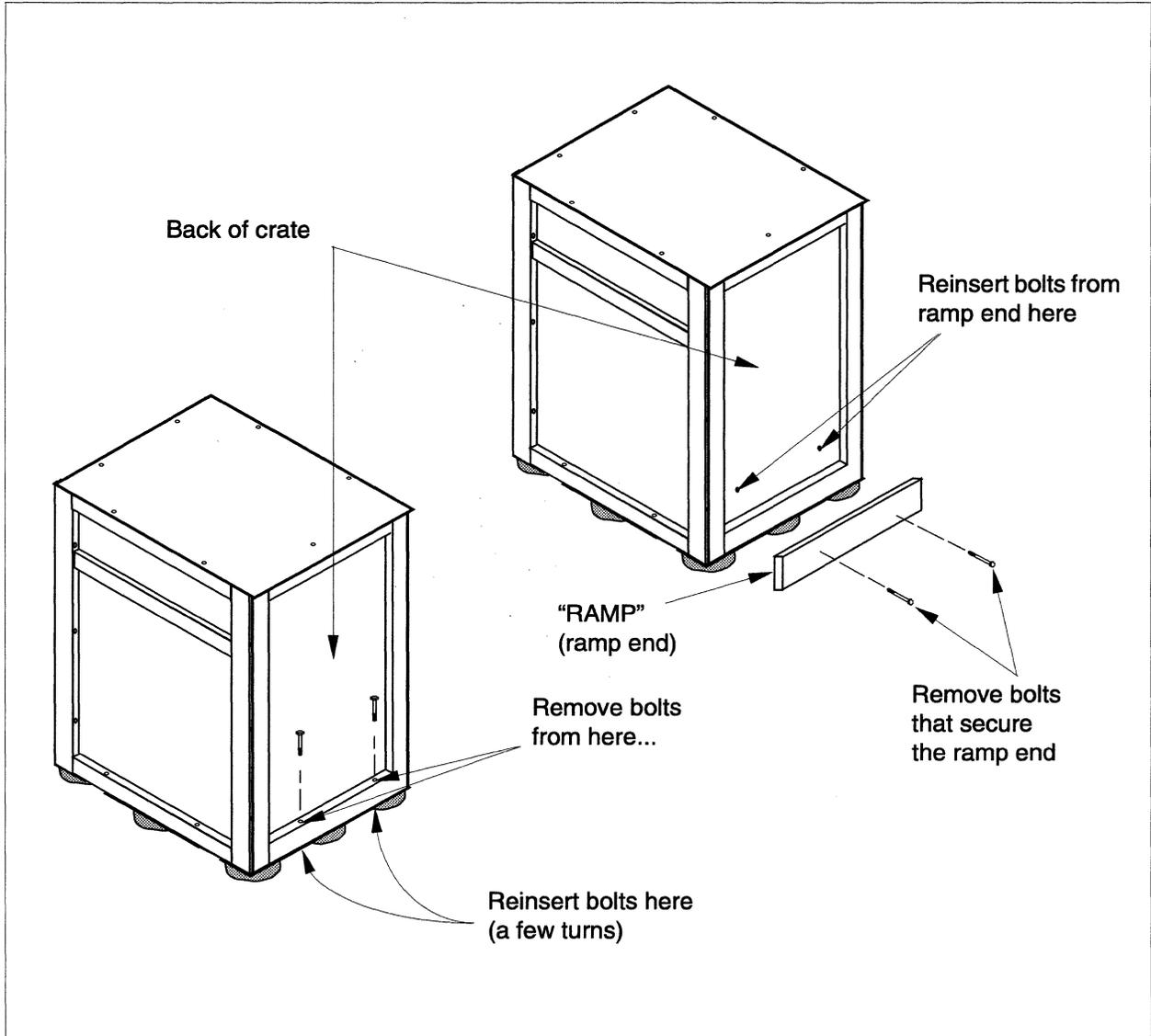
Figure 2-3. Remove Ramp End and Bolts from the Back of Wooden Shipping Crate
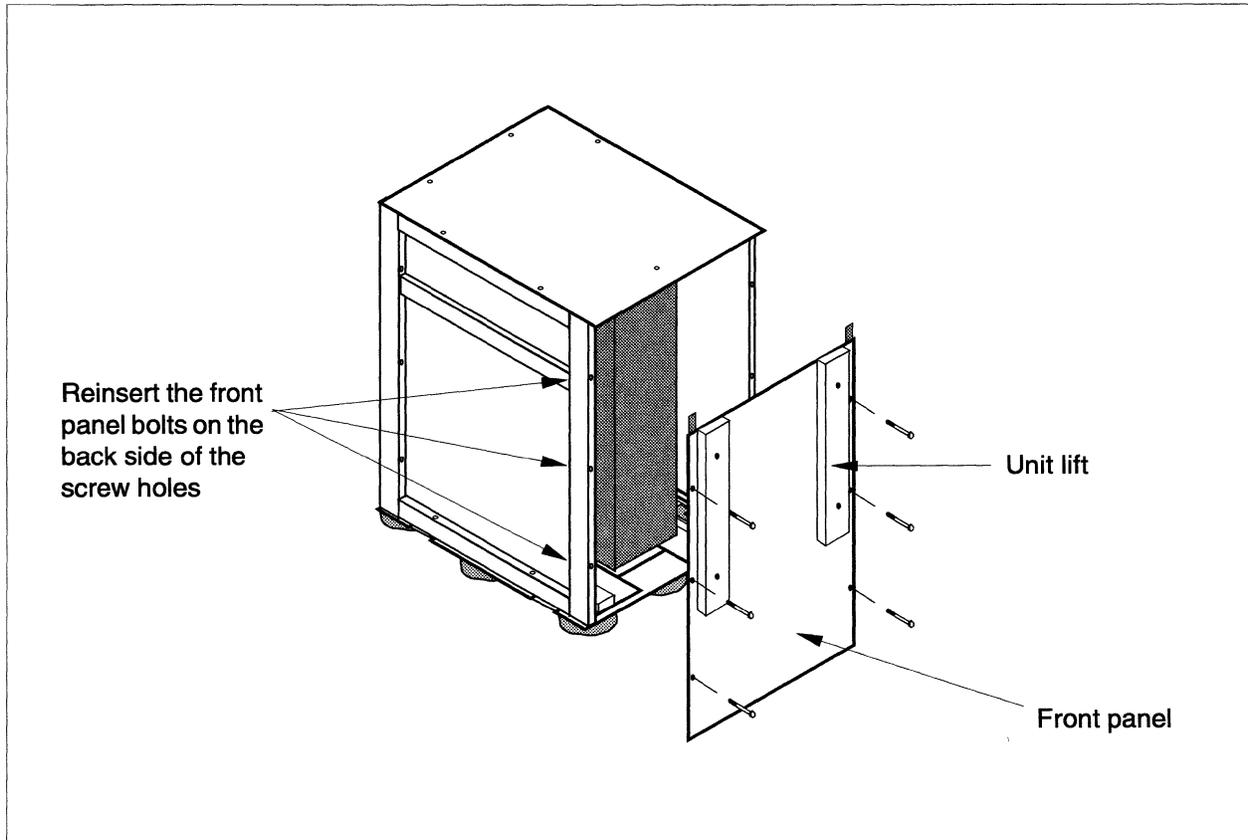
Figure 2-4. Remove the Front Panel from Wooden Shipping Crate

13. Slide the crate back until it just clears the system (Figure 2-5 on page 2-8).

14. On the left side of the crate, clip the tie-wrap securing the system power cable.

15. Remove the four bolts that secure the unit lifts to the front panel. Tie or tape the bolts together and mark them for identification.

16. Lift the front panel, remove the unit lifts, and set them aside (Figure 2-5).
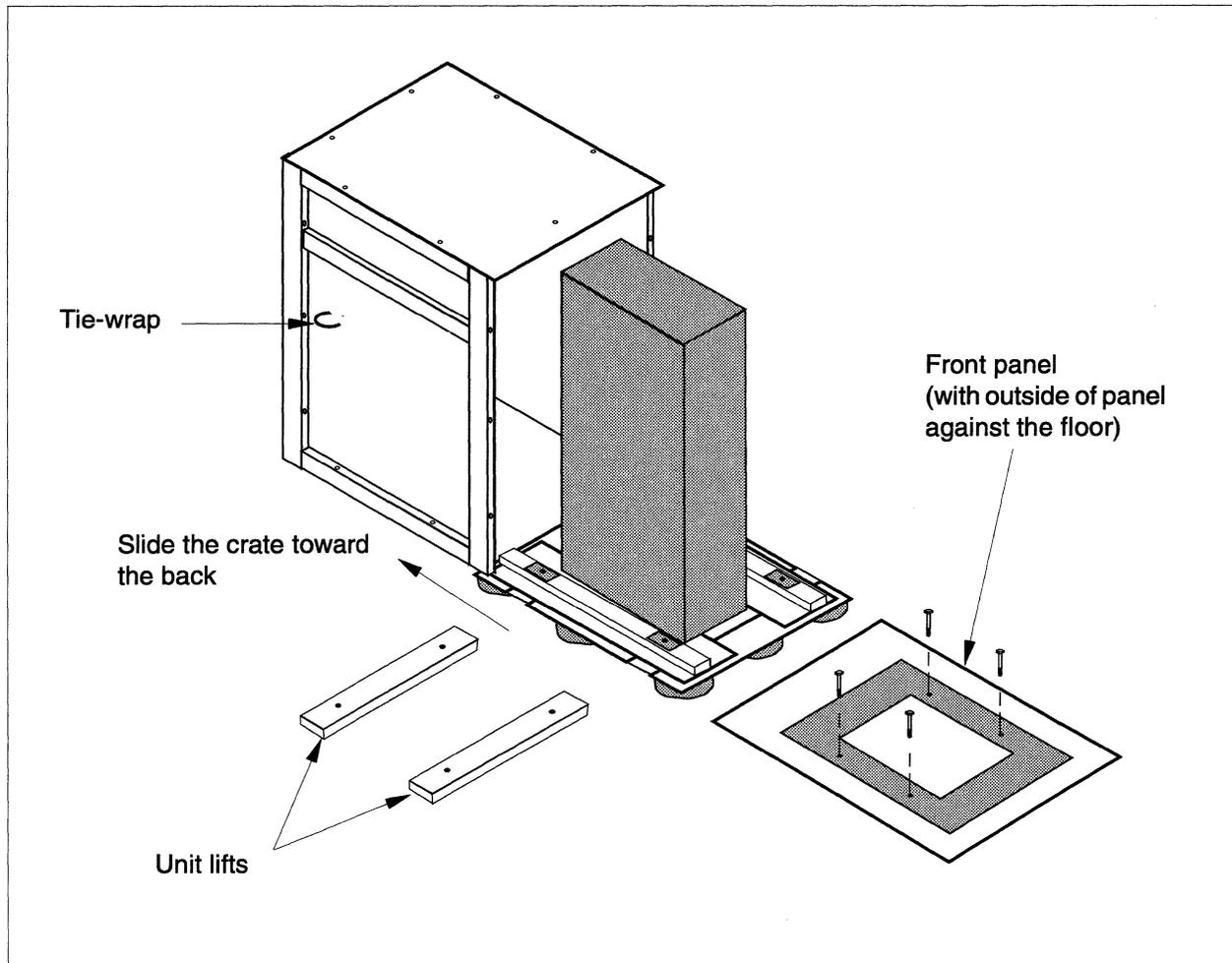
Figure 2-5. Remove the Unit Lifts from Wooden Shipping Crate

17. Turn the front panel over and lay it on the floor with the outside of the panel facing up (Figure 2-6 on page 2-9).

18. Form a ramp with the front panel by attaching the self-stick strips on the front panel to the strips on the base of the crate (Figure 2-6).

19. Position the board marked "RAMP" at the end of the front panel and attach the self-stick strips on the board to the strips on the panel (Figure 2-6).

20. Remove the bolts that secure the support boards for the crate base (Figure 2-7 on page 2-10).

21. Remove the support boards from beneath the base.
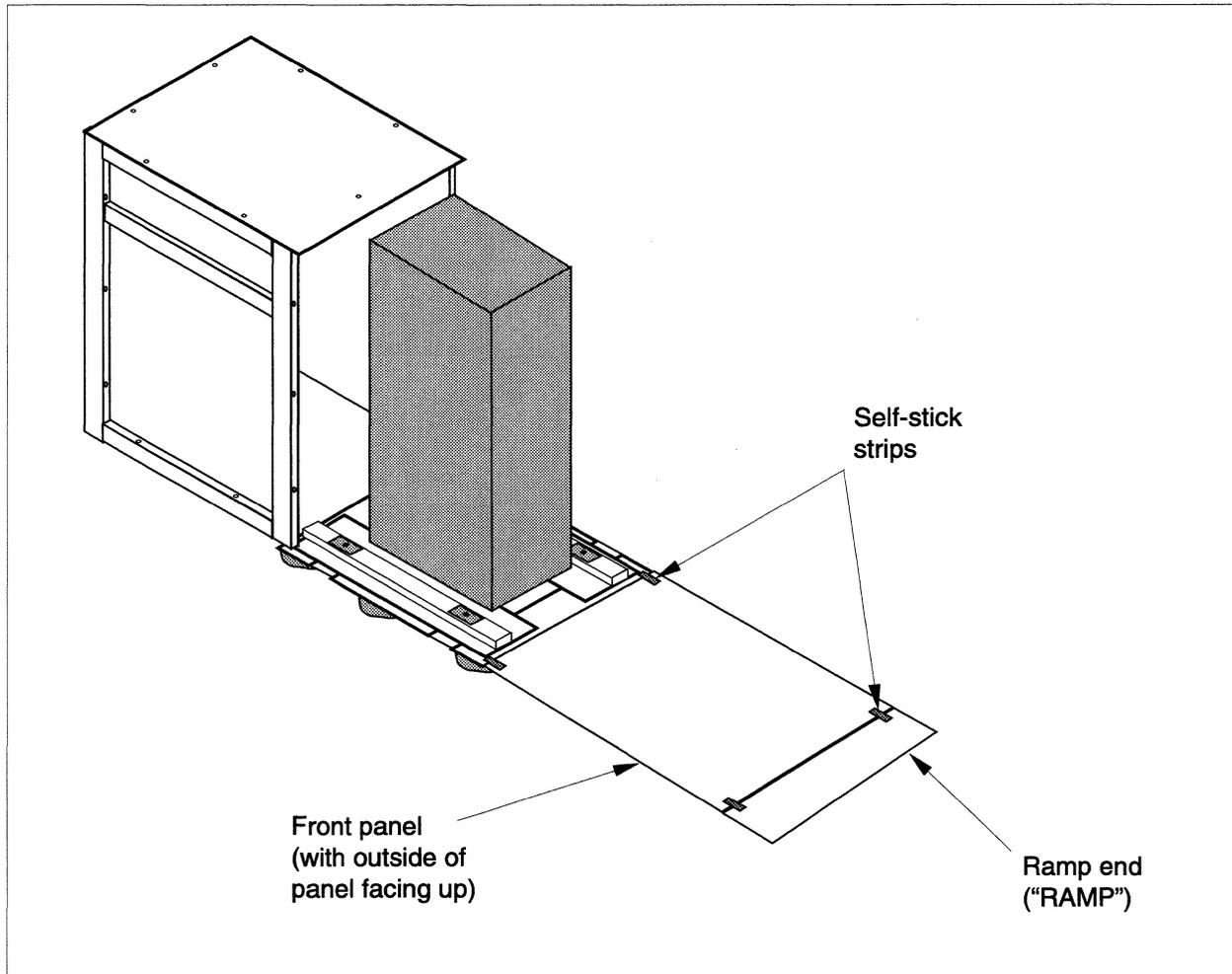
Figure 2-6. Attach the Ramp to Wooden Shipping Crate

22. Remove the board from in front of the system.

23. Obtain the four 8-inch lift bolts that are tie-wrapped to the inside of the right-hand side of the crate (Figure 2-8 on page 2-11).

24. Slide the unit lifts (smooth side down) underneath the crate base. Line up the holes in the lifts with the holes in the metal plates on the crate.

25. Push the four bolts through the metal plates and the crate base so that they thread into the matching holes in the lifts. Make certain that the metal plates will not be in the way of the cabinet when you begin to roll it out of the crate.
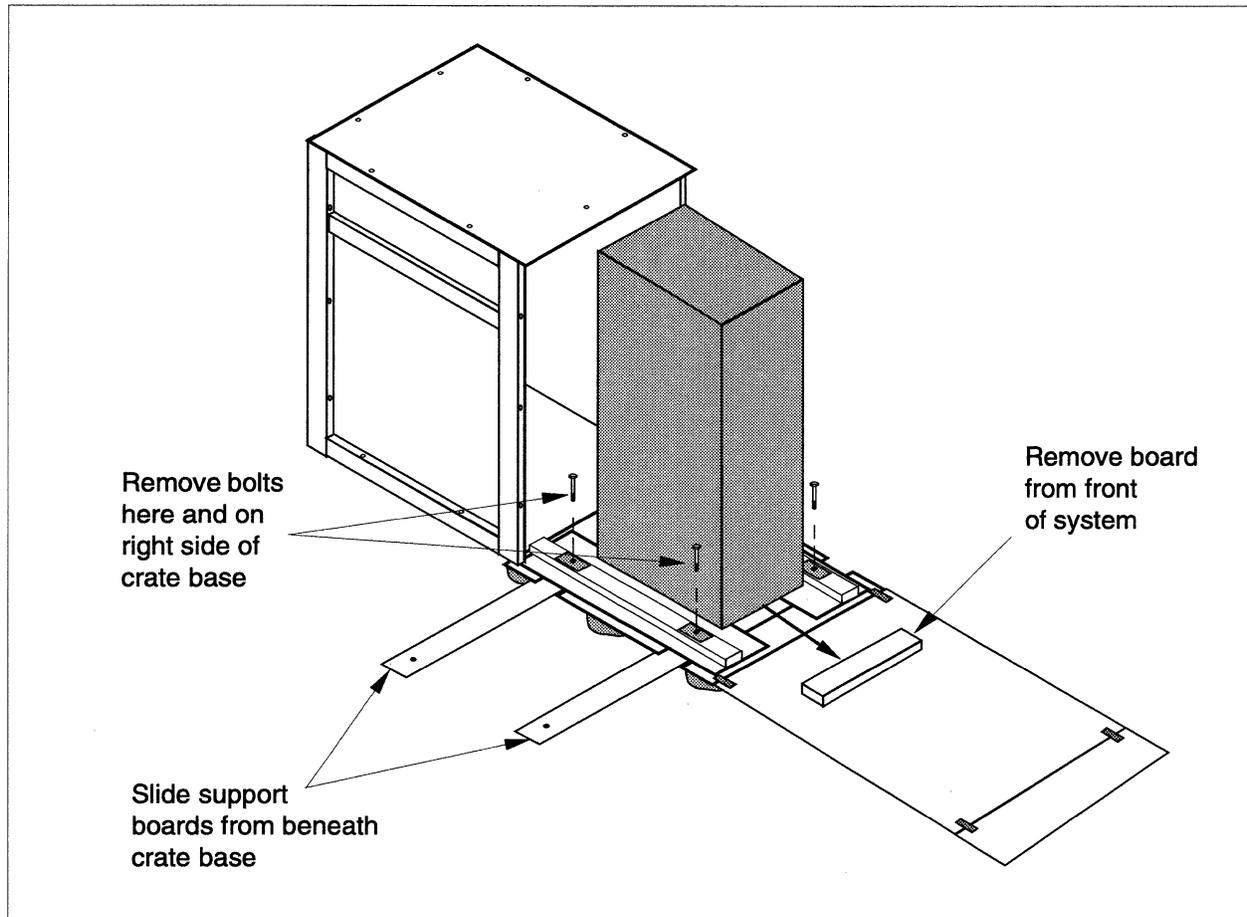
Figure 2-7. Remove Support Boards from Wooden Crate Base

Text labels in figure:
- Remove bolts here and on right side of crate base
- Remove board from front of system
- Slide support boards from beneath crate base

26. Working back and forth between the lift bolts, tighten the four bolts a few turns at a time until there is no more slack between the bolts and the metal plate. As you tighten the bolts, the system cabinet rises up off the crate base. (Make sure the cabinet has been raised enough so that it is free to move.)

27. Position a person at the back of the system and another person on the ramp so that the person at the back can push gently. The person at the front should act as a guide and keep the cabinet from gathering too much speed as it moves down the ramp.

WARNING

The cabinets are extremely heavy (approximately 1000 pounds each). Do not attempt to move the cabinet by yourself; make sure that there are at least two people, one at the front of the cabinet and one at the back.

NOTE

As you tighten the lift bolts, do not tighten any one bolt all the way at one time. Work back and forth between the bolts, tightening each bolt a little at a time until the lift bolts are tight against the metal plates.

Tie-wrap holding the 8" lift bolts

Insert lift bolts here and on right side of crate base

Unit lifts

Metal plate
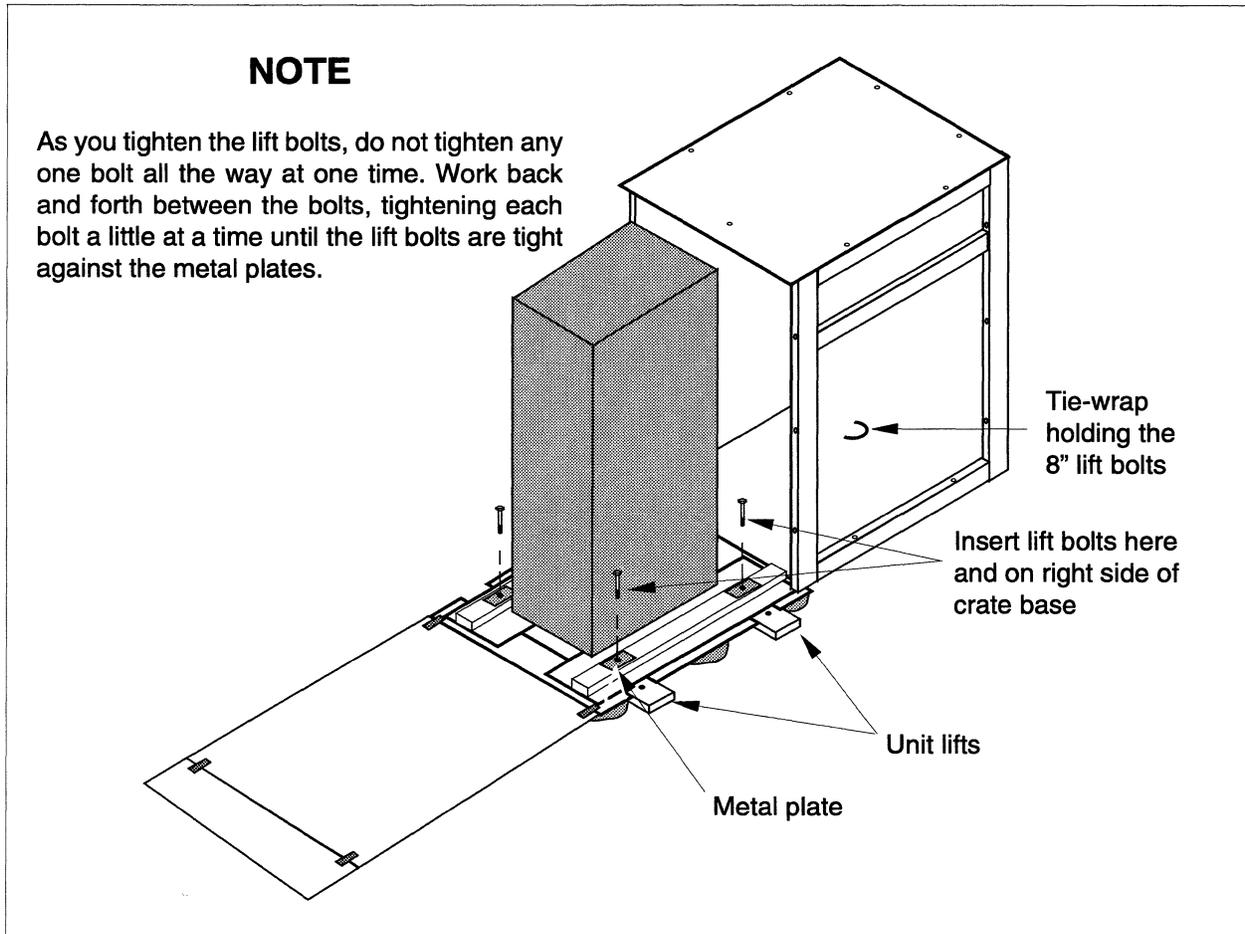
Figure 2-8. Insert the Unit Lifts and Raise the System Off Wooden Crate Base

28. Grasp the cabinet and roll it carefully down the ramp to the floor. If the cabinet refuses to move, do not force it. Go back over the preceding steps and make certain that they have been followed correctly.

29. Move the cabinet to the installation location.

30. Remove the protective covering from the top of the cabinet.

31. The factory labels each cabinet (and its crate) with the cabinet's number (0, 1, etc.). Position the cabinets where they will be used, arranging them in ascending numerical order from right to left (when viewed from the front): the cabinet on the right is 0, the next is 1, and so on.

Cardboard Crate Procedure

Use this procedure to unpack system cabinets shipped in cardboard crates. If you have a multi-cabinet system, the procedure applies to each cabinet.

Each cabinet is enclosed in a cardboard crate with a lid on top (see Figure 2-9). The crate rests on a wooden platform that is part of a wooden pallet. Two vertical metal straps surround the crate and its lid. A ramp that is used to slide the cabinet off the pallet is shipped in a separate crate. (Because only one ramp is needed to unpack many crates, only one ramp is provided.)

Crate & System Front
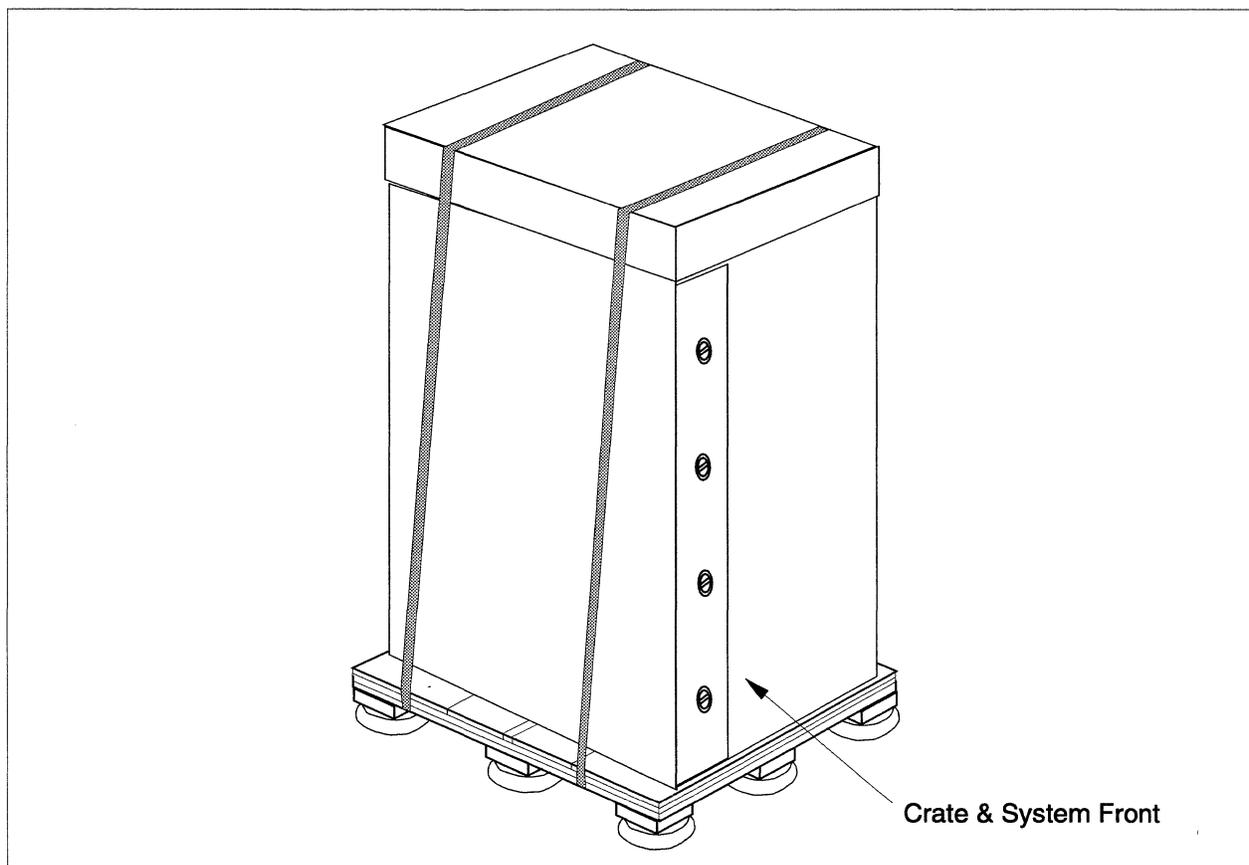
Figure 2-9. Cardboard Shipping Crate

Follow these steps to unpack the cabinet:

1. The cabinet should be unloaded from the front of the crate. Position the crate so that there is enough room left on the floor to hold the cabinet after it is taken from the crate.

2. Cut the two vertical straps surrounding the crate.

3. Lift off the lid of the crate.

4. To release the crate, twist and remove the four plastic plugs shown in Figure 2-9.

5. Remove the crate.

6. The system cabinet, enclosed in an anti-static bag, is now visible. Leave the bag in place.

7. At this point the cabinet and its casters are raised slightly above the level of the deck of the pallet to immobilize the cabinet.

8. Four bolt heads are visible on the pallet. See Figure 2-10. These bolts are loosely turned into two pieces of wood that cross the flat deck of the top surface of the pallet. An air gap (about 1/4 to 1/2 inch) is visible between each of these two boards and the surface above. Tighten each bolt a few turns to raise the board, then do the same for the next bolt. Do not tighten the bolt completely on the first pass. You are done when the air gap is closed.

9. When the air gap is closed, slide out and remove the two pieces of the deck.

10. Lower the system by loosening the bolts. Unscrew each bolt a small amount, then do the same for the next bolt. Work around the bolts in this way until all four are completely unscrewed. Now remove the bolts and slide out the 2x4 pieces they had held in place.

11. Slide in the removable deck pieces that you removed in the step before last so that the deck appears as a single flat surface.

12. The cabinet is still held in place by 2x4s at the front and rear of its base. Remove the 2x4 that is blocking the cabinet. This piece is held in place by a hardware locking mechanism which you can remove by turning the clasp at each corner.
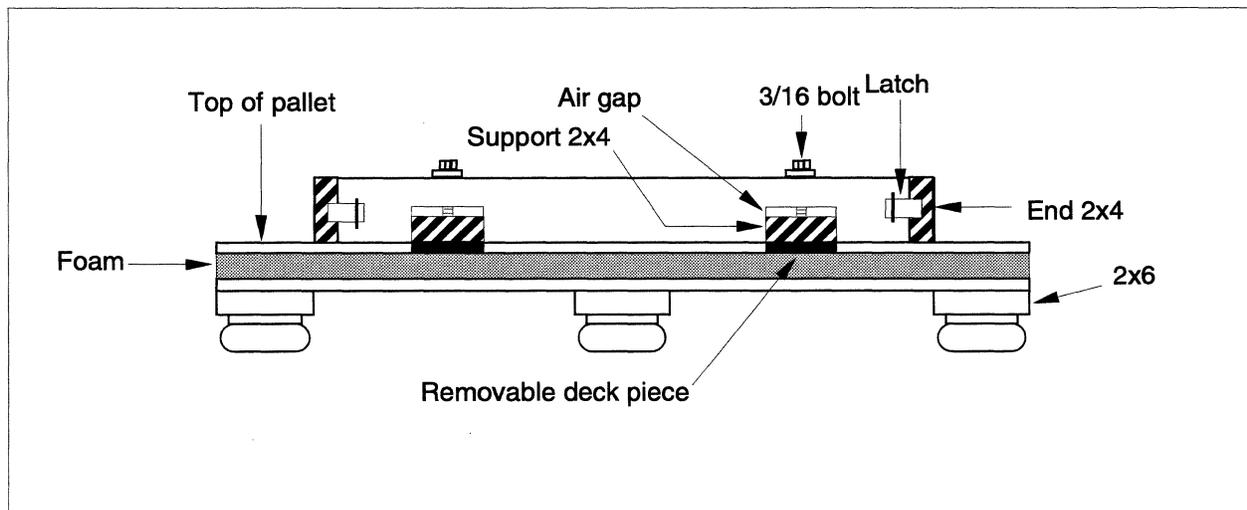
Figure 2-10. Side View of Cardboard Crate Pallet

WARNING

The cabinets are extremely heavy (approximately 1000 pounds each). Do not attempt to move the cabinet by yourself; make sure that there are at least two people, one at the front of the cabinet and one at the back.

13. Remove the ramp from its container and use two of the bolts to dock the ramp against the front of the pallet.

14. Grasp the cabinet and roll it carefully down the ramp to the floor.

15. After you have placed the cabinet in the installation location, remove the anti-static bag and remove the plastic wrap around the power cord.

Unpack the Support Crate and Other Containers

You should now unpack the support crate and any additional containers that came with the system.

Wooden Crate Procedure

In a system that uses wooden crates, the support crate is primarily intended to hold disk drives but it might also contain miscellaneous hardware items. The factory will ship the system software and documentation in the support crate if room allows and in separate containers if not.

Cardboard Crate Procedure

In a system that uses cardboard crates, everything is the same as above except that the support crate contains no disk drives (the cardboard crates are strong enough to ship the system cabinets with the drives preinstalled).

Inspect the Contents of the Shipment

Once you have removed the containers, inspect all the equipment for evidence of damage. Check for scratches and dents or other physical signs of damage. If the equipment is damaged, call the carrier who delivered the system and request an inspection. A claim *must* be filed with the carrier who delivered the equipment. Save all crates, containers, and packing material until the inspection is complete. Be sure to keep a copy of the inspection report.
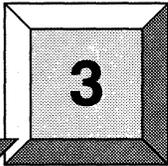
Install the System Cabinets   3

Introduction

This chapter explains how to install the system cabinets. Before performing the procedures in this chapter, be sure you have finished unpacking and positioning the cabinets as described in Chapter 2.

Overview of Cabinet Installation

At this point, the cabinets should be in their approximate final location. Make sure there is adequate room for you to move around the cabinets. This section describes how to install one or more system cabinets. The general steps are as follows (details for each step are in the following sections):

1. Set the foot stops on the cabinet legs.

2. Access the interior of the cabinets.

3. Join multiple cabinets.

4. Check the system connectors

5. Install cables between attached cabinets.

6. Install external Ethernet cables.

7. Remove cosmetic cover plates (if needed).

8. Install the disk/tape drives in the peripheral modules.

9. Install the external cosmetic cover plates.

Tools Required

You need the following tools to install the cabinets:

*   3/16-inch Allen wrench.

*   Flat-bladed screwdriver.

*   Phillips screwdriver.

*   Small flashlight.

*   A power driver is recommended for multiple-cabinet installations.

Set the Foot Stops on the Cabinet Legs

Figure 3-1 shows a cabinet leveler leg and indicates how the foot stops adjust. You should set the foot stops on the cabinet legs improve cabinet stability and to keep the cabinets from moving after they've been installed:
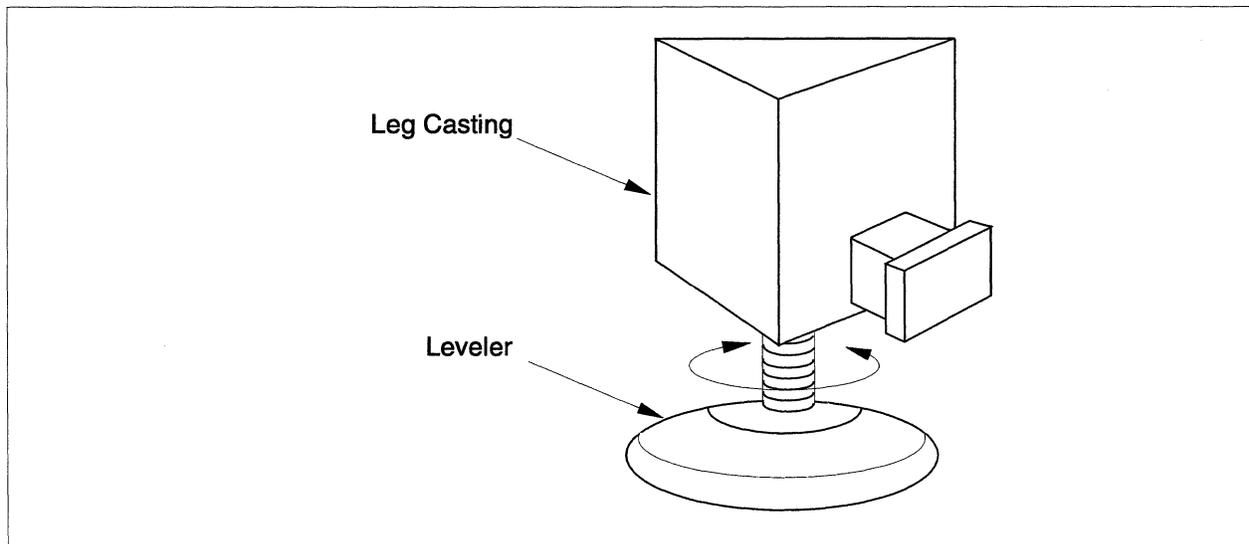
Figure 3-1. System Cabinet Wedge Adapter Casting

WARNING

Once the cabinet is moved to its final installed location, immediately install the cabinet leveler legs and screw the pads out to contact the floor. The cabinet stability provided by the caster

wheels must be supplemented by the leveler legs in order to prevent cabinet tipping when more than one peripheral module or power supply hinge bracket is left open.

1. Adjust the foot stops in both the wedge adapter castings (between multiple cabinets) and the legs at the outer corners of the cabinets so that they fit snugly against the floor.

2. Place the wedge adapter cover over the wedge adapter casting, matching the self-stick seals to secure it.

3. Place the foot covers over the legs, matching the self-stick seals to secure them.

Access the Interior of the Cabinets

You need to open both the front and back doors of the system cabinets, whether you are installing one cabinet or many.

CAUTION

The procedures in this section tell how to open the diagnostic station (DS), the disk drive modules, and the power supply modules. Taken together, these modules are heavy. To reduce stress on the cabinet frame, avoid opening all the modules at once. For instance, if you open all the modules on the front of a cabinet, make sure the modules in back are closed. In general, only one or two modules should be open at any time.

Open the Front Door

Find the lever at the bottom right of the front door. Open the front door by moving the lever counterclockwise 90 degrees (as viewed from above). See Figure 3-2 on page 3-4.

Open the Back Door

To open the back door of the standard cabinet, insert a 3/16-inch Allen wrench in the Allen screw on the right-hand top of the back door. Turn it counterclockwise 90 degrees (as viewed from above) to release the latch and open the door. See Figure 3-2 on page 3-4.

Back door
Allen socket

Front door lever
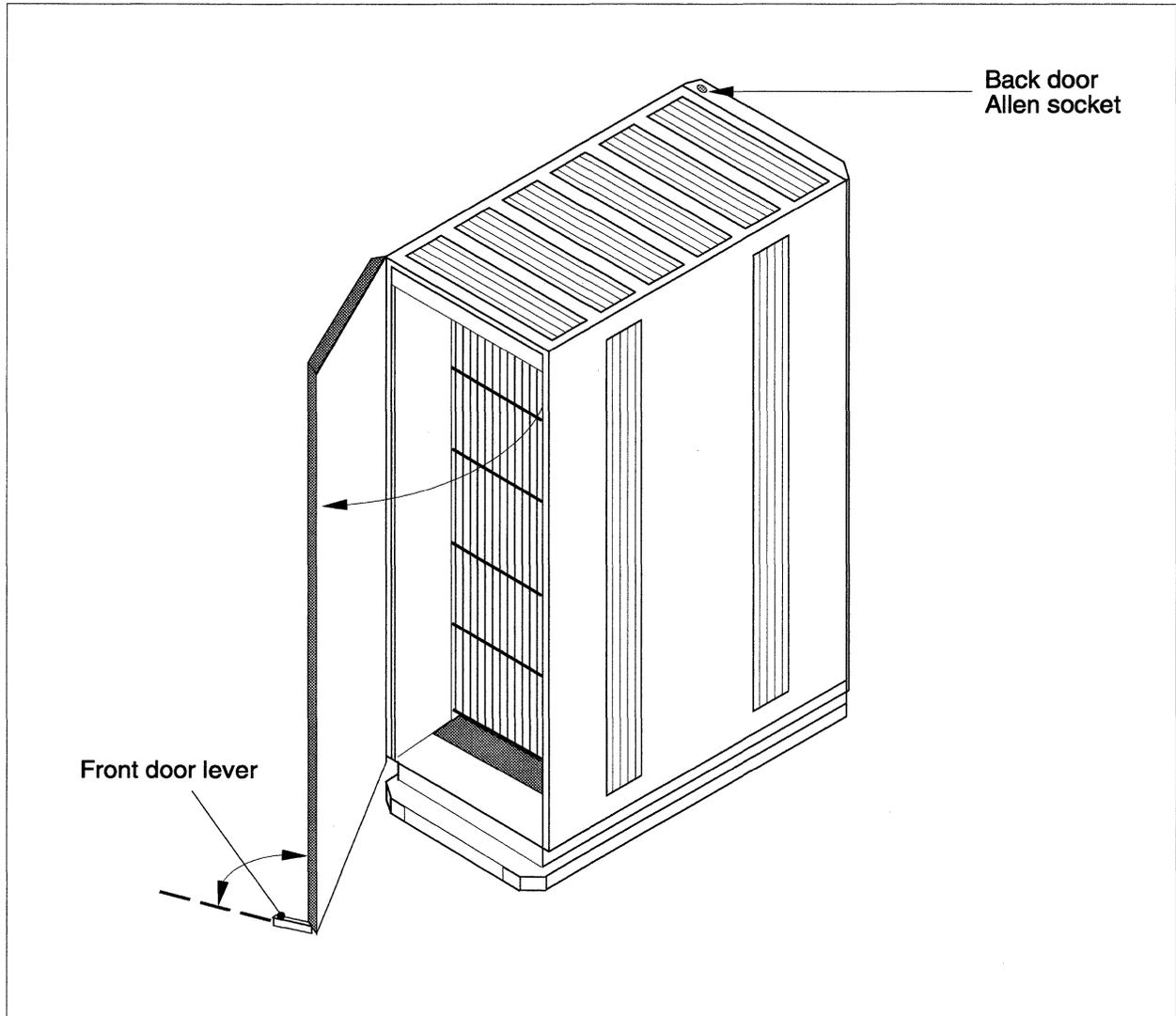
Figure 3-2. Opening the Front Cabinet Door

Swing Out the Diagnostic Station (DS) and Drive Modules

WARNING

Never swing open more than the door and one module (diagnostic station or peripheral module), unless installation tasks require otherwise. It is wise to have a second person nearby when

performing the installation to prevent cabinet tipping. Once the cabinet is at its final installed location, the leveler legs MUST be installed.

To swing out the DS and disk drive modules at the front of cabinet 0 (see Figure 3-3 on page 3-5), do the following:
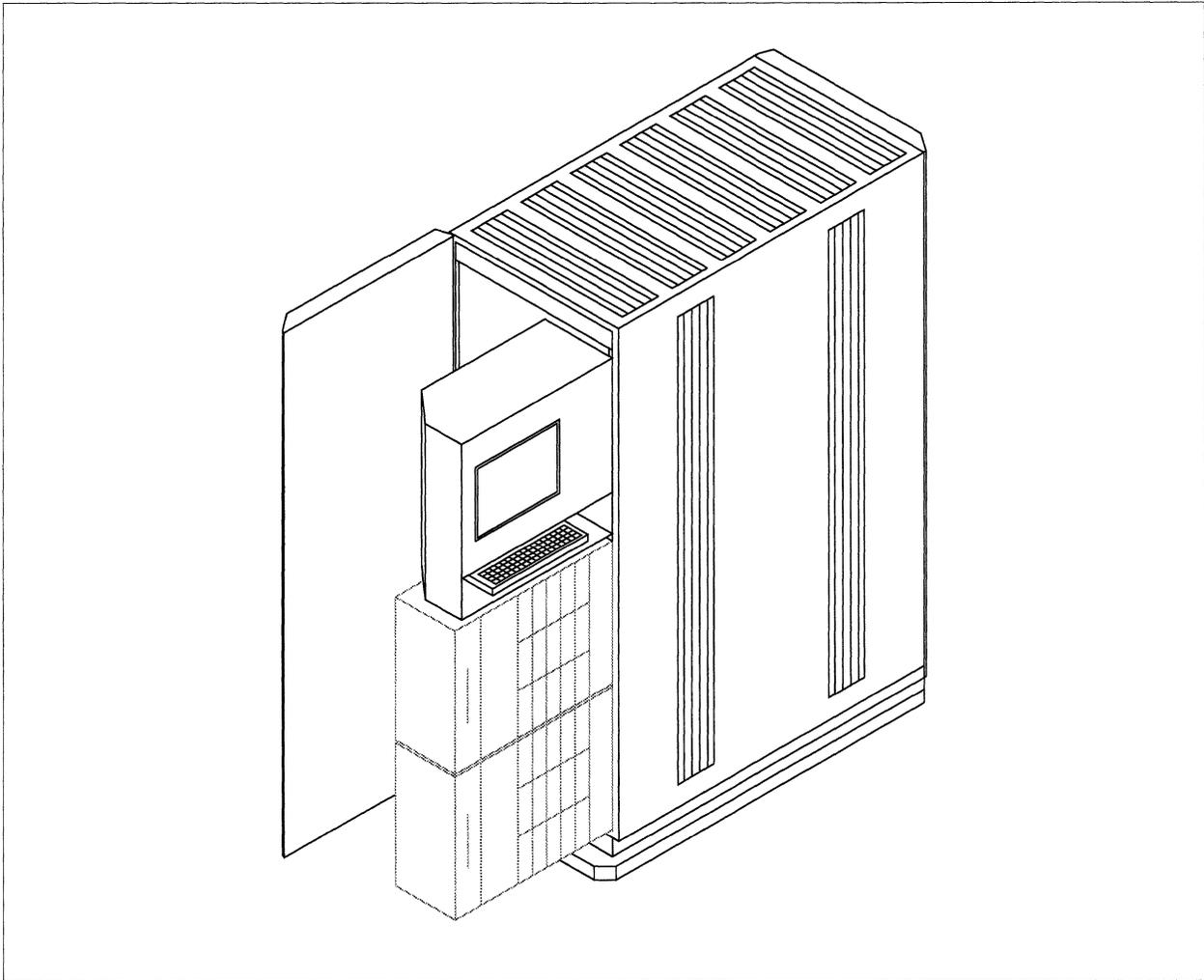
Figure 3-3. Accessing the Cabinet Interior

1. Use a flat-bladed screwdriver to loosen the two thumbscrews on the front of the DS and on the front of the disk drive modules.

2. Grip the handle at the left of the DS and pull. The diagnostic station swings out from the left and locks in position at either 90 degree or 160 degree rotation.

NOTE

Swing out the modules gently. At the back of the DS module is a doorstop mechanism that locks the module in place. If the module is locked in place and you want to rotate the module in or out, reach behind the module, locate the arm of the doorstop mechanism, and lift up on the arm. With the doorstop arm raised, you can rotate the module in or out (up to the maximum of 160°).

3. When closing a module, first lift the handle-end of the module slightly and push back so it rests on the module stop. Once the module is closed, finger-tightening the thumbscrews is sufficient.

Swing Out the Power Supply Modules

WARNING

Never swing open more than the door and one power supply hinge bracket, unless service/installation tasks require otherwise. It is wise to have a second person nearby when performing the installation to prevent cabinet tipping. Once the cabinet is at its final installed location, the leveler legs MUST be installed.

To swing out a power supply module, move to the back of the system and follow these steps:

1. Loosen the two thumbscrews at the right of the module with a flat-bladed screwdriver.

2. Firmly grip the loosened screws, lift up slightly, and pull. The power supply hinge bracket rests on a bracket stop when closed. The module swings out from the right.

3. When closing a power supply module, first lift the outer-end of the hinge bracket slightly so it can rest on the bracket stop. Once closed, finger-tightening the thumbscrews is sufficient.

4. If the thumbscrews don't immediately align with the screw hole, insert a flat-bladed screwdriver in the notch on the bracket face and twist against the notch to align the thumbscrew with the screw hole.

Check the System Connectors

Open the cabinet rear door, then check all of the power plugs on the power channel to ensure that no connections were loosened during shipment. Make sure the main AC circuit breaker at the back of each cabinet base is turned off (in the down, "0" position). Check the mesh expansion cables to make sure their connections are tight.

Figure 3-4 shows the rear of the Paragon cabinet and indicates the main breaker, a mesh expansion cable, and the power channel location.
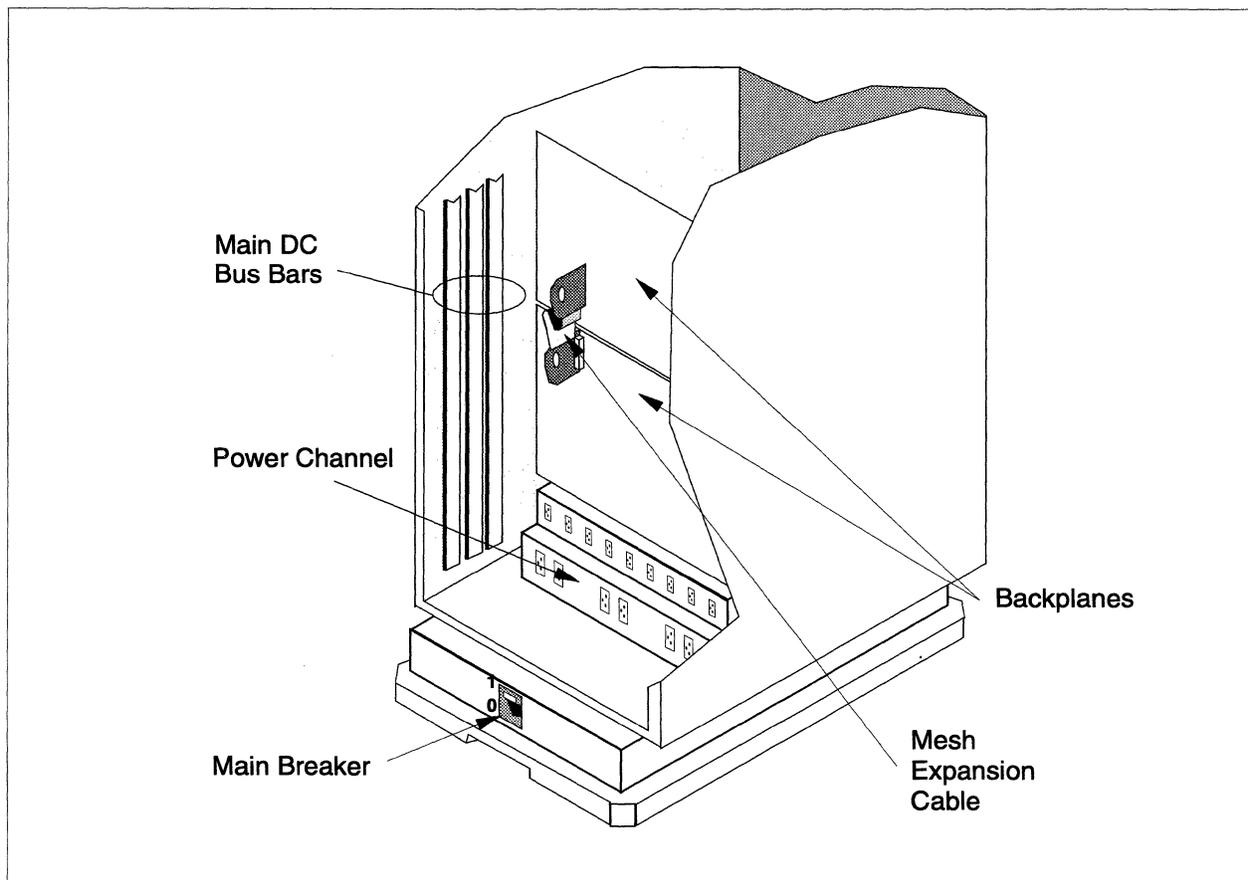
Figure 3-4. Paragon™ XP/S System Connectors

Join Multiple Cabinets

If your system consists of more than one cabinet, the cabinets must be joined. You connect multiple-cabinet systems at the sides by connecting the factory-installed EMI flange on one cabinet to the long slot on the side of the adjacent cabinet.

WARNING

The cabinets are heavy. To protect yourself (especially your hands and fingers) from possible injury, exercise caution when moving the cabinets. In most cases, at least two people (one at the front and one at the back) are required when moving a cabinet.

To join the cabinets, do the following:

1. Position cabinet 0 exactly where you want it and install the leveler legs.

2. Roll cabinet 1 next to cabinet 0, and align the cabinets so that the EMI flange on one cabinet lines up with the long slot in the side of the cabinet next to it. Viewed from the front, the cabinets must be in order from right-to-left: cabinet 0 on the right, cabinet 1 to the immediate left, and so on. (Figure 3-5 on page 3-8 shows a top view of how the cabinets should be aligned.)
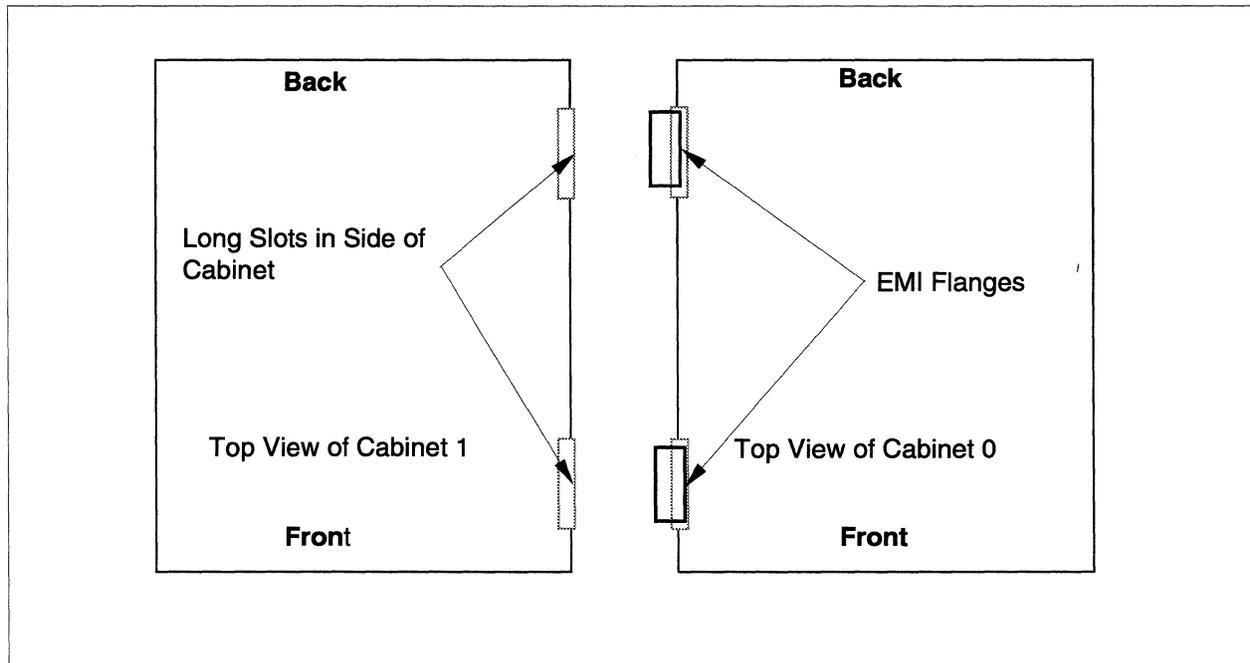
Figure 3-5. Align the System Cabinets

3. Move cabinet 1 against cabinet 0, fitting the EMI flanges into the long slots of the adjacent cabinet so that the holes in the slots line up with their respective screw holes in each cabinet. When properly positioned, the cabinets should be flush against one another.

4. Secure the cabinets to each other using Phillips head screws (plus washers and nuts) at each of the locations shown in Figure 3-6. Work back and forth between the locations, tightening each screw a little at a time until all screws are tight. To maintain the alignment of the screw holes while installing the screws, you might need to move the cabinets slightly (see Figure 3-6).
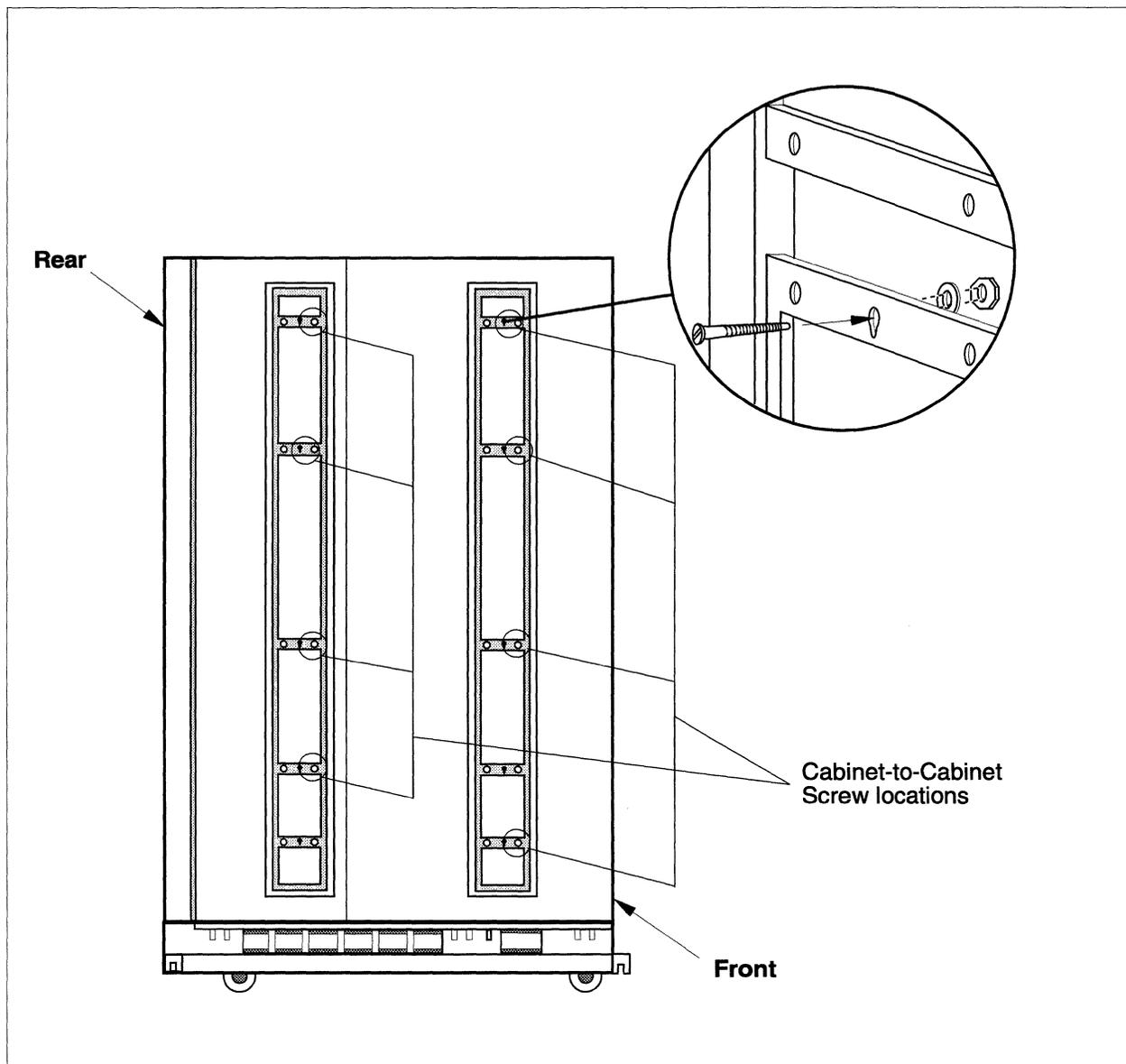
Figure 3-6. Joining the Cabinets

5. As each cabinet is joined with the adjacent cabinet, install the cabinet leveler legs for that cabinet.

Connect Cables Between Cabinets

There are three procedures for installing the external cables between connected cabinets:

- Connect the backplanes.

- Connect the LED controller boards.

- Connect the power supply controller boards.

Connect the Backplanes

In multiple-cabinet systems, there are two types of cables that need to be run between the backplanes of each cabinet: a scan-string ribbon cable and a heavy, mesh expansion cable. Work top-to-bottom and left-to-right from the back of the cabinets. Figure 3-7 on page 3-11 shows the scan-string and mesh expansion cable connections between two cabinets. Figure 3-8 on page 3-12 shows the location of backplane connectors. To connect the backplanes, do the following:

1. One end of the short scan-string cable is factory-installed on backplane connector J59 in cabinet 1. Connect the other end of that scan-string cable to backplane connector J58 in cabinet 0.

2. Connect one of the mesh expansion cables to backplane connector J22 in cabinet 1.

3. Connect the other end of the mesh expansion cable to backplane connector J17 in cabinet 0.

4. Connect a second mesh expansion cable between connector J21 in cabinet 1 and J18 in cabinet 0.

5. Repeat the above procedure to connect the backplanes between additional cabinets.

CAUTION

The closely mounted mesh expansion cables must not touch each other. Be very careful not to bend any pins.
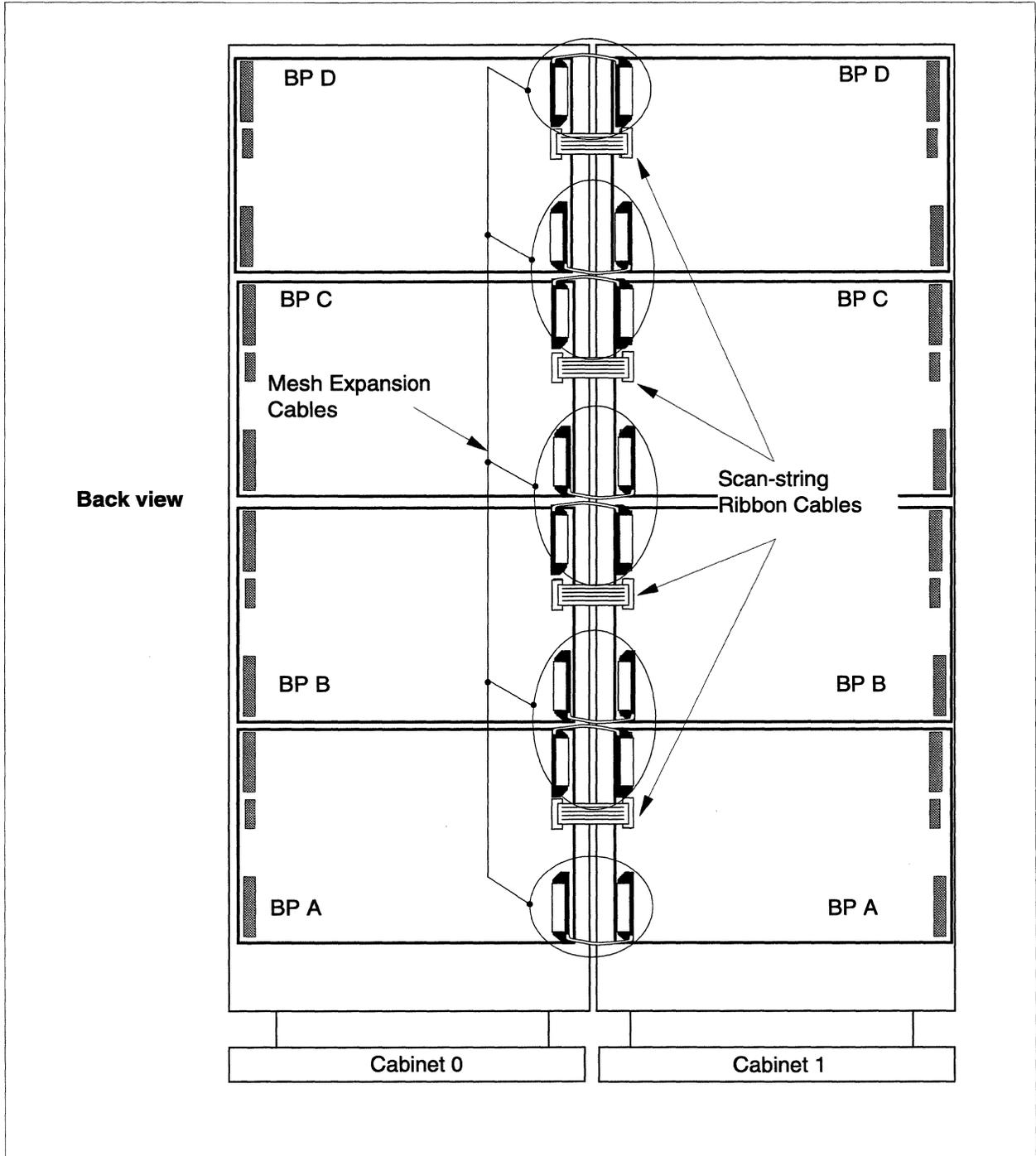
Figure 3-7. Scan-String and Mesh Expansion Cable Connections Between Two Cabinets
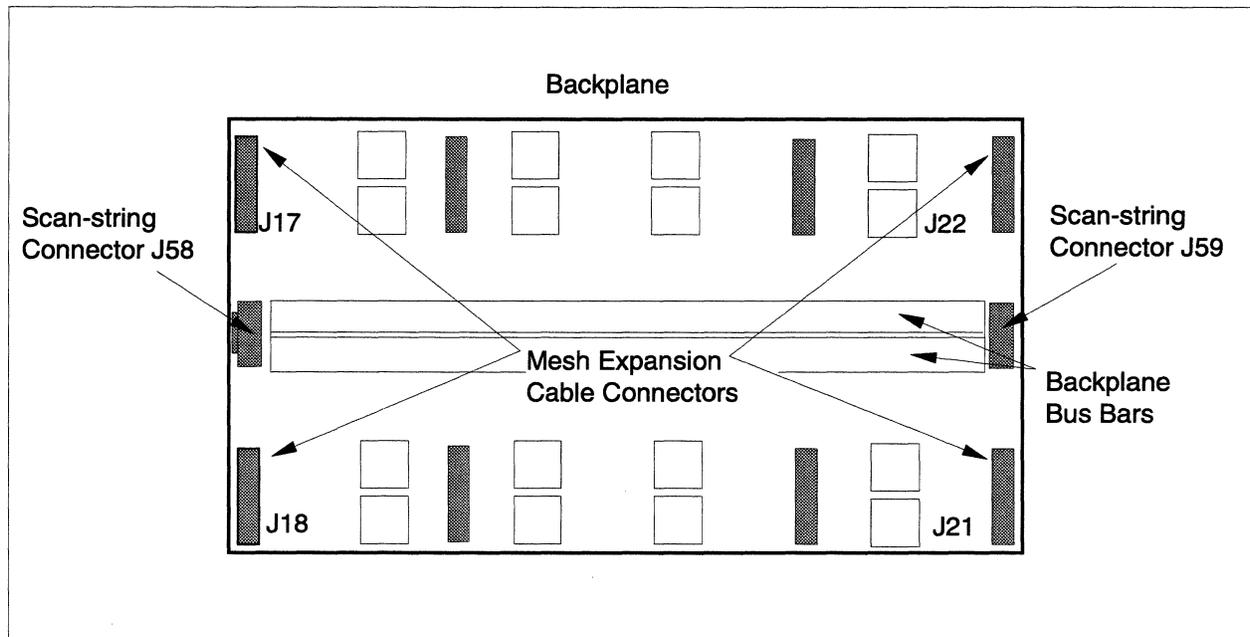
Figure 3-8. Backplane Connections

Connect the LED Controller Boards

A multicolored twisted-pair cable carries signal information between cabinets for the front panel
LED displays. The cable runs between the LED controller boards that are located on the bulkhead
at the bottom right of each cabinet when viewed from the rear of the cabinet. To connect the LED
controller boards, do the following:

1.   Feed the cable through the opening at the bottom where the cabinets join.

2.   Working left-to-right, connect the colored twisted-pair cable from J900 on the LED controller
     board in Cabinet 0 to J801 on the LED controller board in Cabinet 1 (Figure 3-9).

3.   Continue the J900 to J801 daisy-chain connection for each cabinet in the system.

LED Controller Board

J801 (Out to next cabinet)

J800

J900 (In from preceding cabinet)
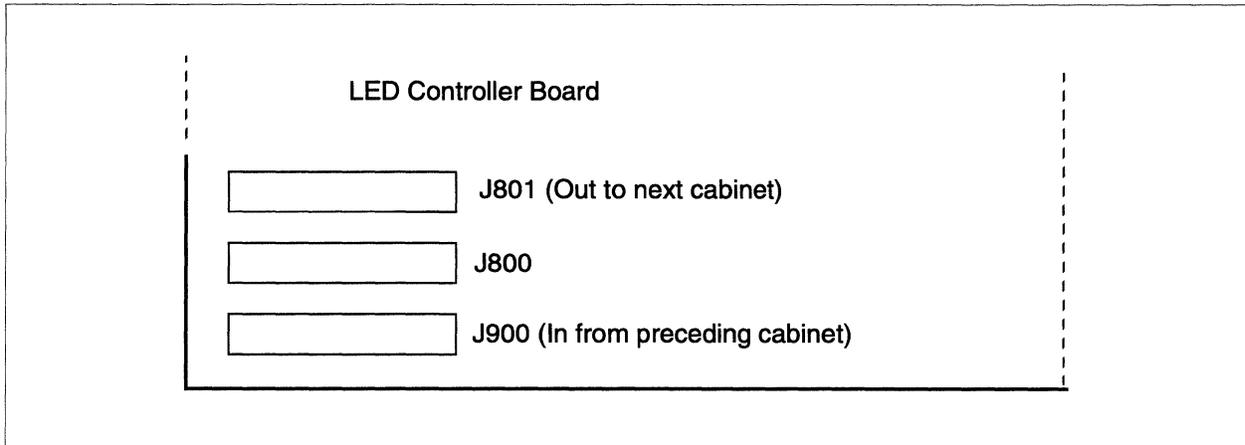
Figure 3-9. LED Controller Board Showing Daisy-Chain Connectors

Connect the Power Supply Controller Boards

The power supply controller boards are located at the back of the system cabinet, in the top left corner. There are two cables that form a daisy-chain connection between all cabinets in the system: a four-conductor power cable and a scan-string ribbon cable. To connect the power supply controller boards, do the following (Figure 3-10 on page 3-14):

1. Clip the tie-wrap that holds the cable bundle together.

2. Feed the cables through the space at the top where the cabinets join. Notice that the four-conductor power cable (two red and two black) is already plugged into the power connector labeled "Out" on the controller board in Cabinet 0.

3. Plug the other end of the four-conductor power cable into the power connector labeled "In" on the controller board in Cabinet 1. The power connectors are keyed, so the red wires should be on the left at both "Power Connector In" and "Power Connector Out."

4. Repeat Steps 2 and 3 until all of the power supply controller boards in the system are daisy-chained.

5. The long scan-string ribbon cable is already connected to the scan-string connector labeled "Out" on the controller board in Cabinet 0 (Figure 3-10).

6. Connect the other end of the scan-string cable to the right-angle connector on the controller board in Cabinet 1 (labeled as scan-string "In" in Figure 3-10).

7. Using the cables supplied with the system, continue connecting the scan-string cables until all the power supply controller boards in the system are daisy-chained.
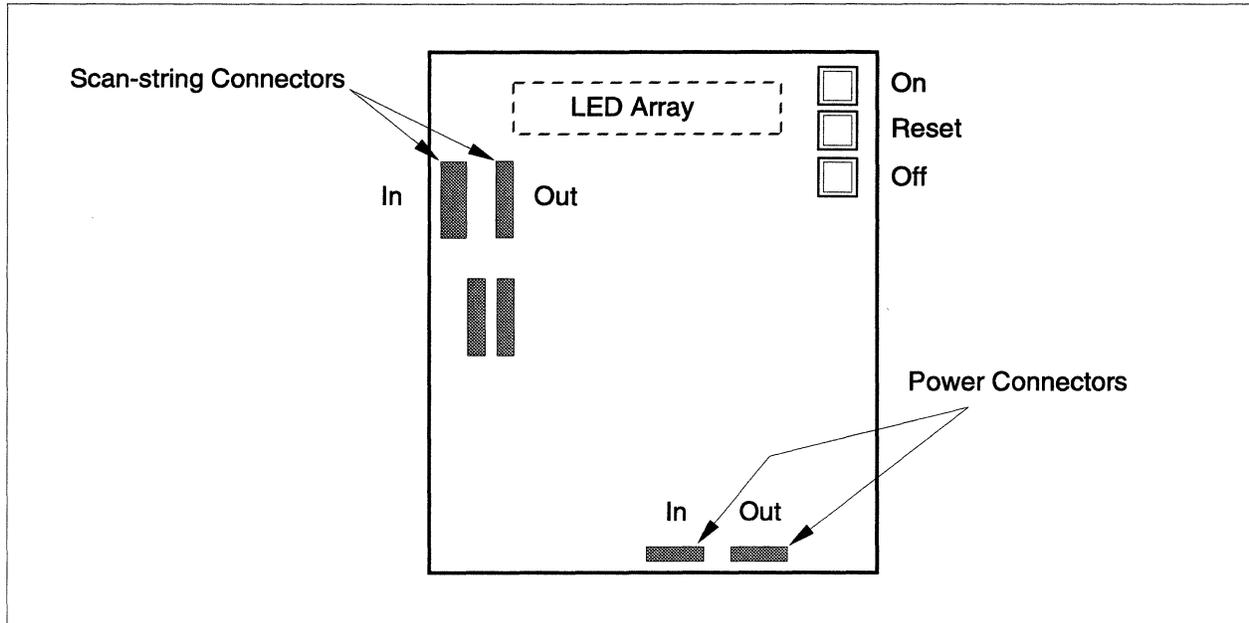
Figure 3-10. Power Supply Controller Board Connectors

NOTE

The Reset button shown in Figure 3-10 does NOT reset the system. It resets the condition of the LED array for the cabinet in which the power controller board resides. The On and Off buttons are explained in Chapter 4.

This completes the installation procedures at the back of the cabinet. Close all of the power supply modules. Fasten the modules. The module screws only need to be finger tight.

If you are installing multiple cabinets, close the back doors of the other cabinets. You should feel the spring lock engage, and the doors should fit snugly.

Install External Ethernet Connections

CAUTION

If the Paragon XP/S system is to be connected to other equipment through non-isolated interfaces (e.g., SCSI, RS-232, or HIPPI signal cables) insure that no differences of potential (caused by noise on the safety ground) exist between the Paragon cabinet and the other equipment cabinet. Before connecting the signal cables, apply power to both units and monitor the voltage between the Paragon I/O panel and the chassis of the other equipment. Any DC voltage, power line frequency voltage, or noise spikes of short duration which exceed approximately 500 millivolts peak can cause data errors or even system faults which require operator intervention. Problems of this type can be avoided by using the same type of safety ground connection to power receptacles for the other equipment as is described for the Paragon cabinets.

CAUTION

Use conductive or static-suppressive foam blocks to protect the exposed connectors of long, under-floor, external cables while the cables are being routed and prior to connection with the I/O node or external equipment. The conductive or static-suppressive foam prevents damage to cable connector pins, and dissipates any static charge that might otherwise be transmitted to the external equipment or to the I/O node.

Generally, all the Ethernet connections go to one cabinet, but in large installations they might go to several. When installed at the factory, each Ethernet node has an internal Ethernet cable connecting the node to the I/O bulkhead panel, and a stub Ethernet cable that goes from the I/O bulkhead panel to the cavity under the cabinet. All unused cutouts of the I/O bulkhead panel should be covered.

Figure 3-11 and Figure 3-11 on page 3-16 show both the original and current versions of the I/O panel installed in the base of the Paragon XP/S system cabinet. Refer to these figures while performing the procedures in this section.

To install Ethernet cables, perform these steps:

1. Feed the external Ethernet cables under the cabinet so that they reach the stub cable connectors or the connectors in the cutout panel at the bottom front inside the cabinet.

2. Loosen the screws in the I/O bulkhead panel.
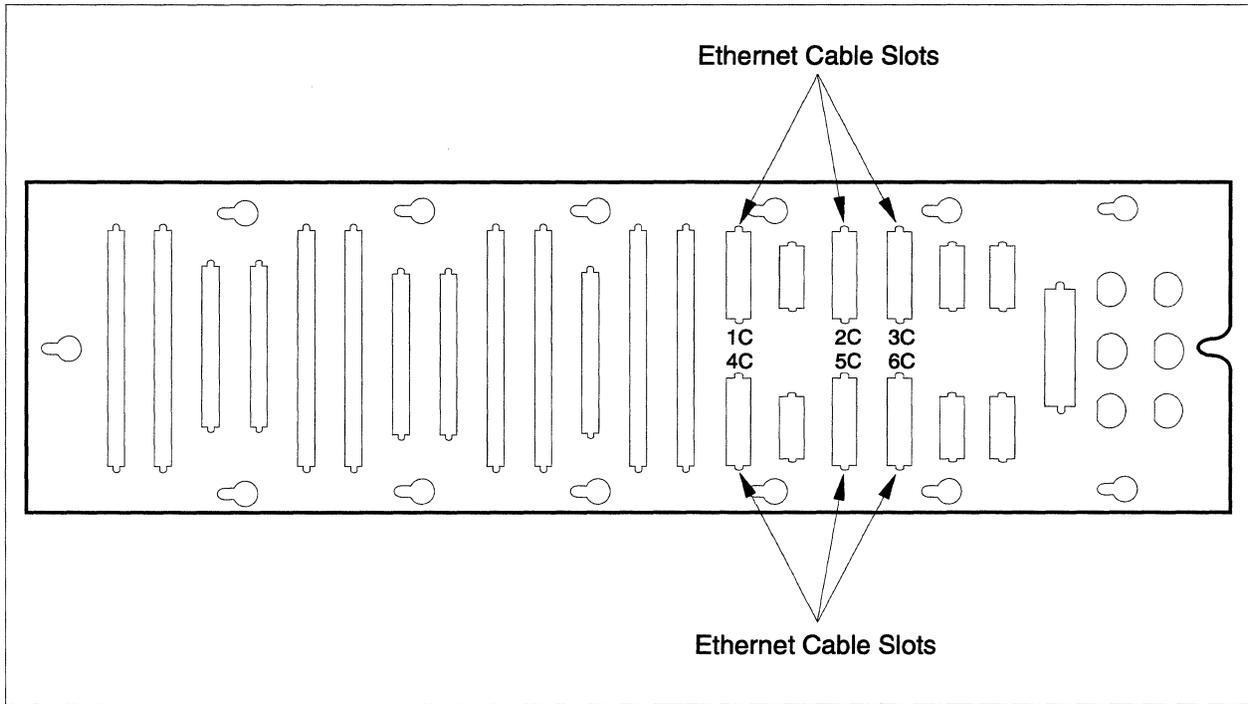
Figure 3-11. Installing Ethernet Cables (Original I/O Panel)
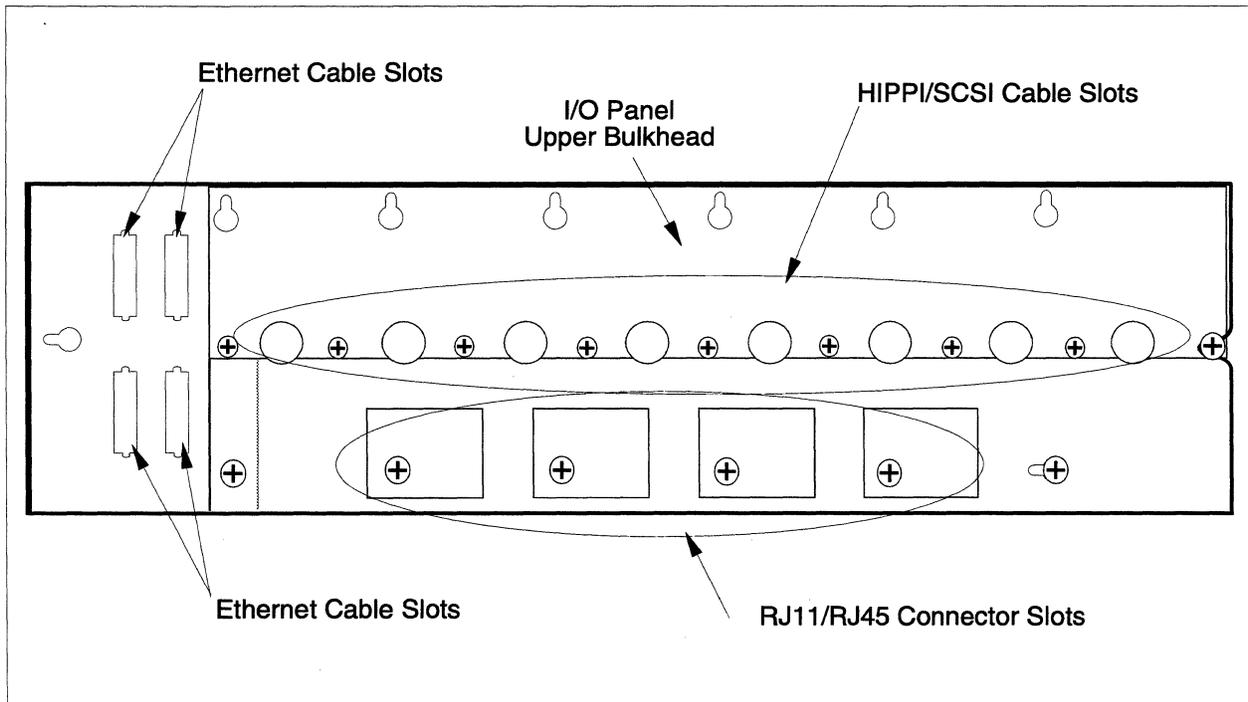
Figure 3-12. Installing Ethernet Cables (Current I/O Panel)

3. Slide the cutout panel with its connectors to the left until you see that it can be removed. Lift it gently.

4. Connect the external cables to the connectors mounted in the cutout panel, or the connector on the end of the stub cable.

5. Replace the cutout panel and make sure that the connections remain intact.

NOTE

All unused connector cutouts in the I/O panel must be covered. If necessary, obtain the correct cutout covers and install them over the unused slots in the I/O panel.

Install Paragon™ XP/S System Corner Units

The cabinet footprint of large Paragon XP/S systems might be physically too long to fit within the computer room floor space of some sites. One extra cost option that can be used to fit a large (long) Paragon XP/S system into a limited space is to install corner units. The corner unit option changes the footprint from a long, straight line of cabinets to an "L" or a "U" shaped configuration. The corner units have no affect on system operation (other than a minor increase to mesh communication latency), but their installation might make it difficult or even impossible to watch all of the front door LEDs at the same time.

The corner unit uses a cabinet-height wedge that allows the adjacent cabinet to turn by 45 degrees from the alignment of the previous cabinet. Two Paragon XP/S system corner units are required to change the cabinet alignment by 90 degrees, and four corner units are required to change the cabinet alignment by 180 degrees.

The procedures in this section describe how to install a single Paragon XP/S system corner unit. Repeat the procedures in this section as often as necessary based on the number of corner units that are to be installed.

Mechanical Installation

The following steps describe how to perform the initial mechanical installation of the Paragon XP/S system corner unit:

1. Position the cabinets in the approximate position and alignment that they will be after the corner unit is installed, then remove any existing grills, EMI flanges, or cabinet joining hardware from the facing vertical slots of the cabinets. Refer to the *Paragon™ System Site Preparation Guide* if necessary to determine corner unit alignment information.

CAUTION

Make sure the full length of the cabinet rear slots has exposed, bare metal. If any segment of this length is covered with paint or other non-conductive material, use conductive metal tape to restore an adequate ground path. Poor conduction paths will defeat the Paragon XP/S system cabinet EMI shielding.

2. Install copper EMI gasket clips around the full periphery of each of the EMI flanges of the corner unit. The EMI gasket material can be cut to fit if necessary. Figure 3-13 shows a top portion of the corner unit EMI flange and indicates how the clips are to be installed.
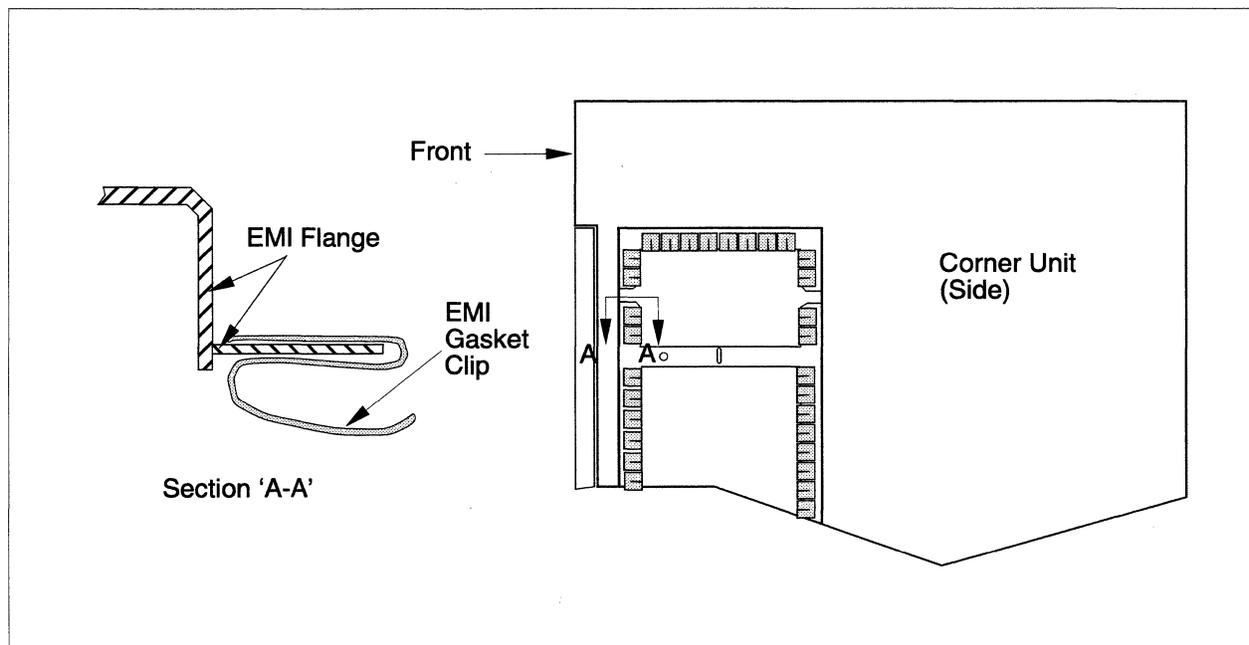
Figure 3-13. Installing EMI Gasket Clips

3. With the front panel and grill removed from the corner unit, carefully mate the corner unit EMI flange with the rear slot of the first cabinet. Secure the corner unit loosely to the cabinet using five Phillips-head machine screws, washers, and (if necessary) nuts. Figure 3-14 shows the corner unit and cabinet, and indicates how to join the corner unit EMI flange to the cabinet slot.

4. Carefully align the next cabinet with the other side of the corner unit, then roll it in until the EMI flange mates with the rear slot of the cabinet. Secure the corner unit loosely to this cabinet using five Phillips-head machine screws, washers, and (if necessary) nuts.

5. At the lower rear of the corner unit, loosely attach the angle bracket to the corner unit and two cabinets using three socket-head screws.

6. Repeat steps 2 through 5 for each corner unit that is to be installed with this Paragon XP/S system.

7. After all corner units are initially installed, adjust the alignment and position of the cabinets, then tighten all screws (five with each EMI slot and three with each angle bracket).
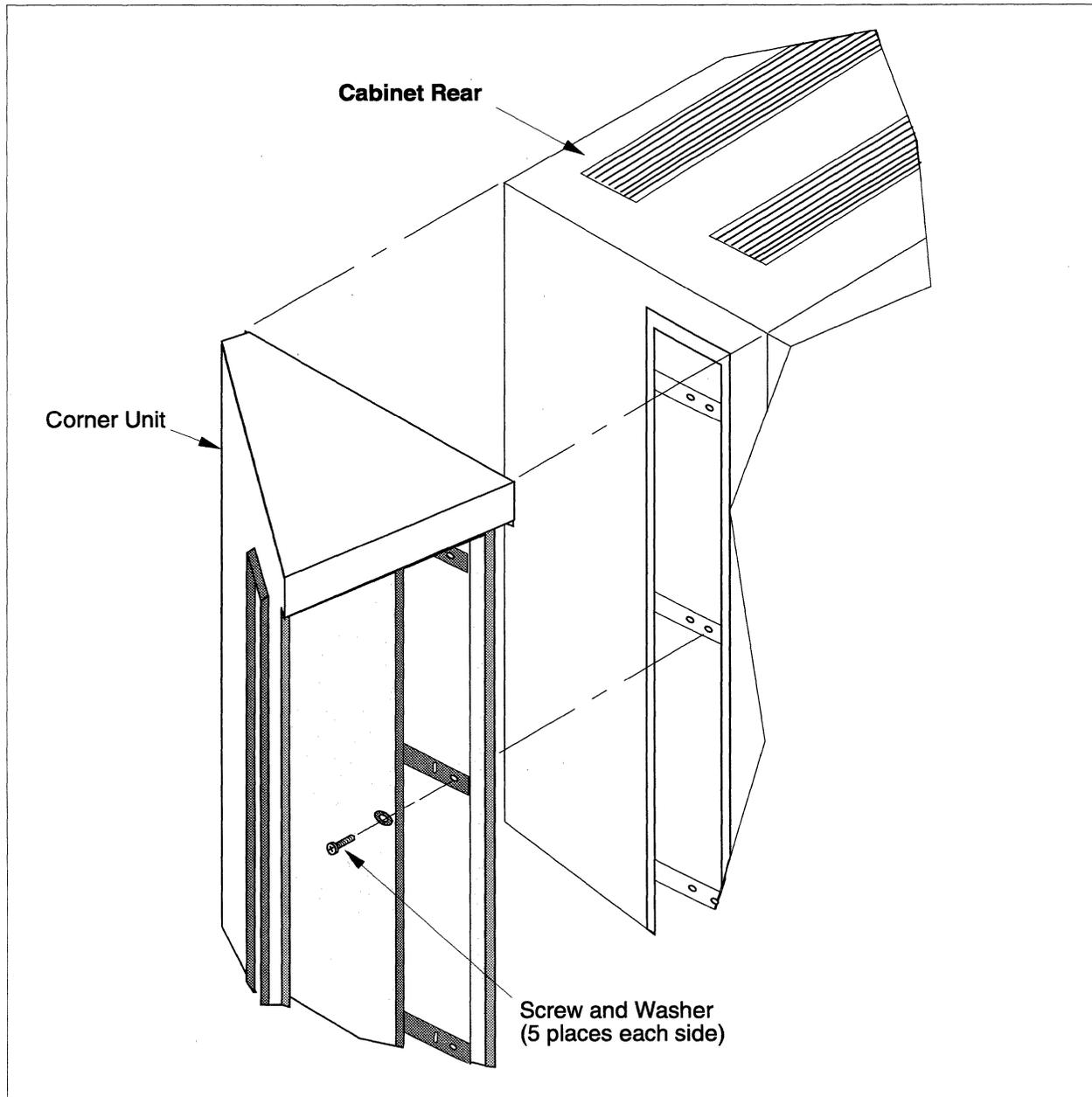
Figure 3-14. Mating the Corner Unit to the Cabinet

Corner Unit Cable Installation

Figure 3-15 shows the routing of cabinet-to-cabinet cables that are associated with the corner unit installation. Perform the following steps to install the cabinet-to-cabinet cables associated with each corner unit installation:
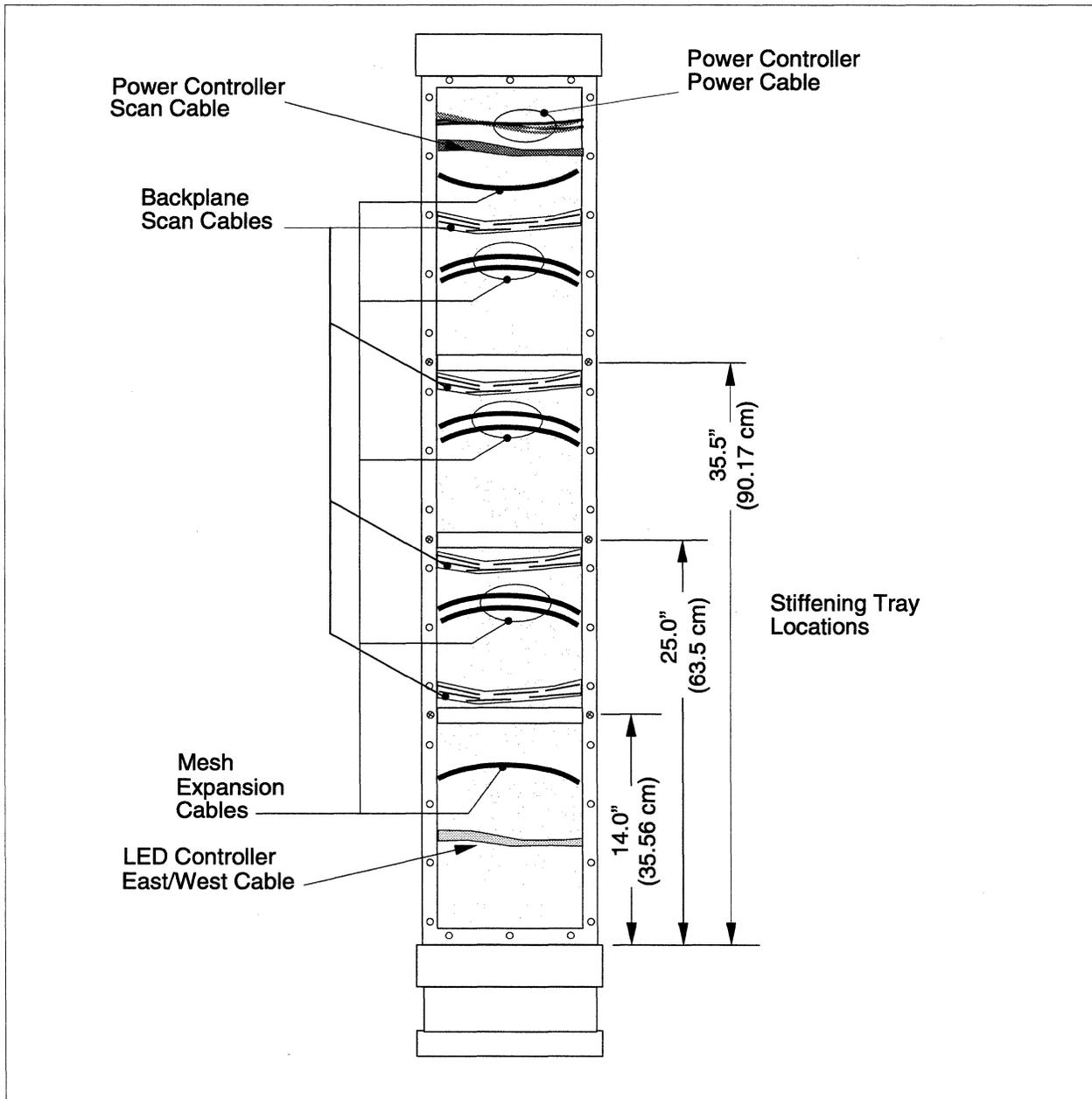
Figure 3-15. Corner Unit Cable Routing

1. As shipped, the corner unit internal stiffening trays might interfere with routing of the cabinet-to-cabinet cables. If necessary, remove and reinstall the internal stiffening trays. As measured from the corner unit base, there should be one internal stiffening tray at 14 inches (35.56 cm), one at 25 inches (63.5 cm), and one at 35.5 inches (90.17 cm). Refer to Figure 3-15 for the stiffening tray locations.

CAUTION

Cable routing should be performed by two people; one at the rear of the cabinets, and one at the front of the open corner unit. While it is not impossible for a single person to route cables through the corner unit, doing so increases the chance of damaging the mesh expansion cables or connector pins.

2. Open the rear doors of the cabinet on either side of the corner unit, then swing open the power supplies on their hinges so you have access to the cardcage backplanes.

3. Refer to Figure 3-15 for cable routing information. Route the backplane scan cables as follows:

   A. Starting with the top cable, connect the backplane scan cable to backplane connector J58 of the right-hand (viewed from the rear) cabinet.

   B. Have your helper (in front of the corner unit) continue routing the backplane scan cable through the corresponding slot on the opposite side of the corner unit, then into the other cabinet.

   C. Connect the other end of the backplane scan cable into backplane connector J59 of the left-hand (viewed from the rear) cabinet.

   D. Repeat steps A through C for the remaining backplane scan cables (four cables total through each corner unit).

4. Refer to Figure 3-15 for cable routing information. Route the corner unit mesh expansion cables as follows:

   A. Starting with the top mesh expansion cable, pre-bend the cable at the edge of each connector, then route the cable from the cabinet slot next to the backplane connector, then into the corner unit.

   B. Have your helper (in front of the corner unit) continue routing the mesh expansion cable through the corresponding slot on the opposite side of the corner unit, then into the other cabinet.

C. Once the mesh expansion cable is routed, carefully plug the connector into the backplane of the cabinet from which you started. The other end of the mesh expansion cable will be plugged in later.

D. Repeat steps A through C for the remaining mesh expansion cables (eight mesh expansion cables total between cabinets). For paired mesh expansion cables (indicated in Figure 3-15), carefully plug in the lower connector first, then the upper connector.

E. Open the back door of the other cabinet, then swing the power supplies out to gain access to the backplanes.

F. Starting with the top mesh expansion cable, carefully plug the mesh expansion cables into the proper backplane connectors (J17/J18 or J21/J22). For paired mesh expansion cables (indicated in Figure 3-15), carefully plug in the lower connector first, then the upper connector.

G. Continue plugging in the mesh expansion connectors until all eight have been connected.

H. After all mesh expansion cables have been connected, make sure the mesh expansion cables are bent as indicated in Figure 3-15. The top mesh expansion cable should be bent down, and all remaining cables should be bent up.

5. Plug the power controller power chain cable into connector J480 of the power controller board in the left-hand cabinet (viewed from the rear).

6. Route the power controller power chain cable up, then through the corner unit (as indicated in Figure 3-15), into the right-hand cabinet, then connect it to connector J380 of the right-hand cabinet power controller board.

7. Plug the power controller scan-string cable into connector J130 of the power controller board in the left-hand cabinet (viewed from the rear).

8. Route the power controller scan-string cable up, then through the corner unit (as indicated in Figure 3-15), into the right-hand cabinet, then connect it to connector J030 of the right-hand cabinet power controller board.

9. Plug the LED controller East/West cable into connector J801 of the LED controller board on the lower right wall of the left-hand cabinet (viewed from the rear).

10. Route the LED controller East/West cable through the corner unit (as indicated in Figure 3-15), into the right-hand cabinet, then connect it to connector J900 of the right-hand cabinet LED controller board.

11. Using cable ties, secure the LED controller East/West cable, power controller power cable, and power controller scan-string cable to appropriate tie points within each cabinet.

Final Corner Unit Installation

At this point, the cabinets and corner unit(s) should be properly aligned and secured (as described in "Mechanical Installation" on page 3-17), and the cabinet-to-cabinet cables should be installed (as described in "Corner Unit Cable Installation" on page 3-20). Perform the following steps to complete the Paragon XP/S system corner unit installation:

1. Align the corner unit cover plate so the slots are at the top, then secure it to the corner unit using 36 flat Phillips-head screws. Tighten the screws.

2. Insert the tabs of the corner unit grill into the cover plate slots, then align the grill and press on the front until the velcro strips make full contact. The grill can be pulled back and repositioned if necessary.

3. Position a silver-colored grill over the exposed front slot of one of the cabinets attached to the corner unit, then secure it to the cabinet using 44 #3-48 x 1/4 Phillips-head screws. Repeat this step for the other cabinet attached to this corner unit.

CAUTION

Once the decorative Paragon XP/S system side plaque is placed on the side grill, it cannot be removed or repositioned without damaging either the grill or the plaque. Do not place the side plaque until you are satisfied with its alignment and orientation.

4. After tightening all grill screws, carefully remove the protective cover from the back of a side plaque, orient and align the plaque, then press it into position at the top of the side grill. Follow the same precautions while placing the side plaque for the other cabinet.

5. Attach cabinet foot stops to the exposed front corners of the two cabinets attached to the corner unit. Screw out the legs of these foot stops and the leg in the rear angle bracket until they contact the floor. Put the protective covers over the foot stop and angle bracket assemblies, and press to make sure the velcro tabs make contact.

Repeat steps 1 through 5 for any additional corner units for this Paragon XP/S system.

Install Disk/Tape Drives

NOTE

This section mainly applies to systems shipped in wooden crates. Disk drives are preinstalled in systems shipped in cardboard crates. You will also need to refer to this section whenever adding disk/tape drives to the system or upgrading the drives that are already installed in the Paragon XP/S system.

Remove Internal Cosmetic Cover Plates

The system contains cosmetic cover panels on the cabinet walls inside the front of the system. To install peripheral modules, you must remove a cover panel from each location where a peripheral module will be installed. The four screws that secure the cover panels go into threaded standoffs mounted in the cabinet frame. To remove a panel, remove the screws, washers, and standoffs (Figure 3-16 on page 3-25). Save the panel in case you move the drive module in the future.

Disk/Tape Drive Locations

NOTE

When the Paragon XP/S system cabinet is shipped in a wood crate, disk drives are shipped in a separate support crate and must be installed in the cabinet as part of the hardware installation process. When the Paragon XP/S system cabinet is shipped in the newer cardboard crate, the drives are preinstalled in the cabinet.

The disk drives are pre-numbered at the factory. To install the disk drives in their proper locations, do the following:

1. Arrange the drives in their shipping boxes next to you in their order of installation. A Paragon XP/S system cabinet can contain up to three peripheral modules. Each module can hold up to 15 disk drives. The peripheral modules are identified as X, Y, or Z. Each module is subdivided into three rows (A, B, C) of five drives each (1, 2, 3, 4, 5).

2. Carefully remove each drive from its container and slide it into its proper slot. You should feel a firm connection when the drive is flush with the face of the module. Install all the drives.

3. Set the power screwdriver to low-torque setting.
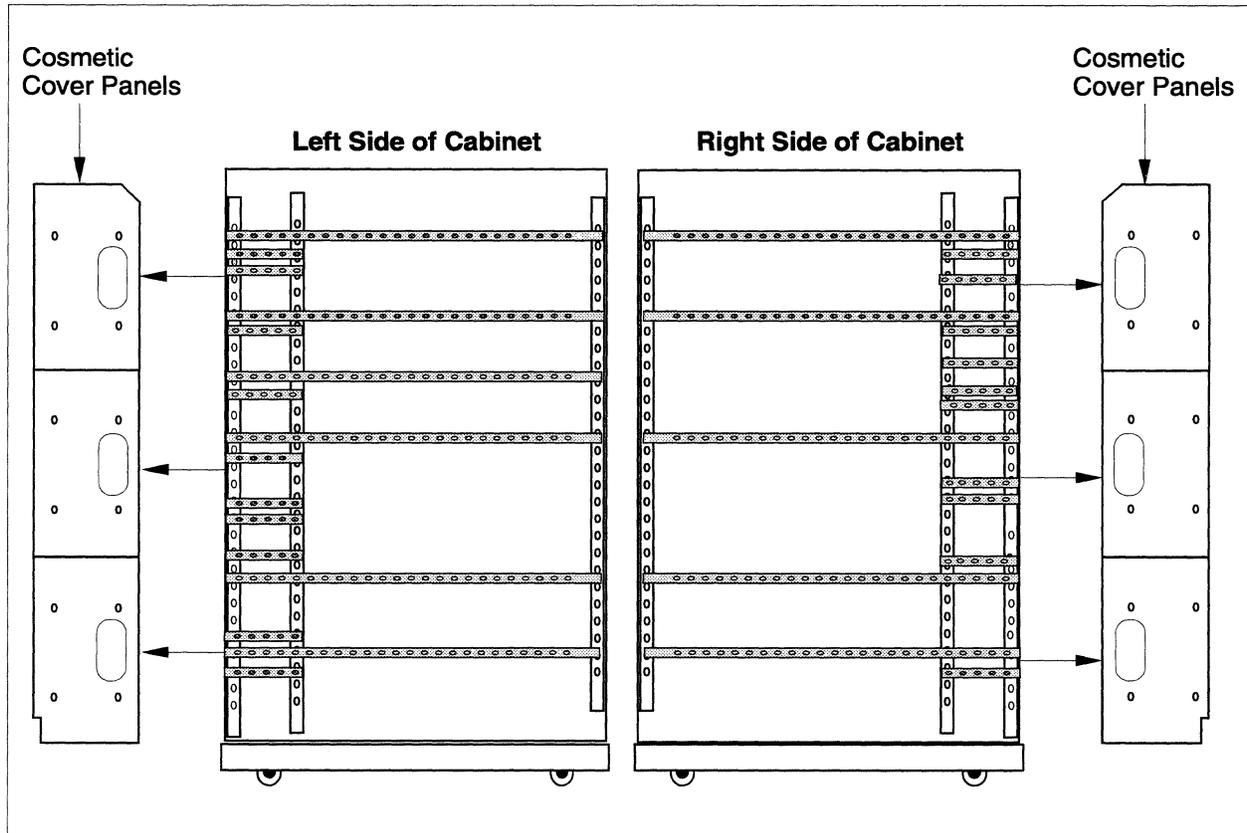
Figure 3-16. Removing Internal Cosmetic Cover Plates

4. Use the power screwdriver to tighten the small slotted screw in the lower edge of each disk drive face plate.

5. Close any peripheral modules or power supply modules that remain open. When closing a module, finger-tightening the thumbscrews is sufficient.

6. To close a peripheral module, reach behind the module, locate the arm of the doorstop mechanism, and lift up on the arm. With the doorstop arm raised, you can easily rotate the module to its closed position.

Figure 3-17 shows the numbering system used for disk/tape drives that are installed in peripheral modules.
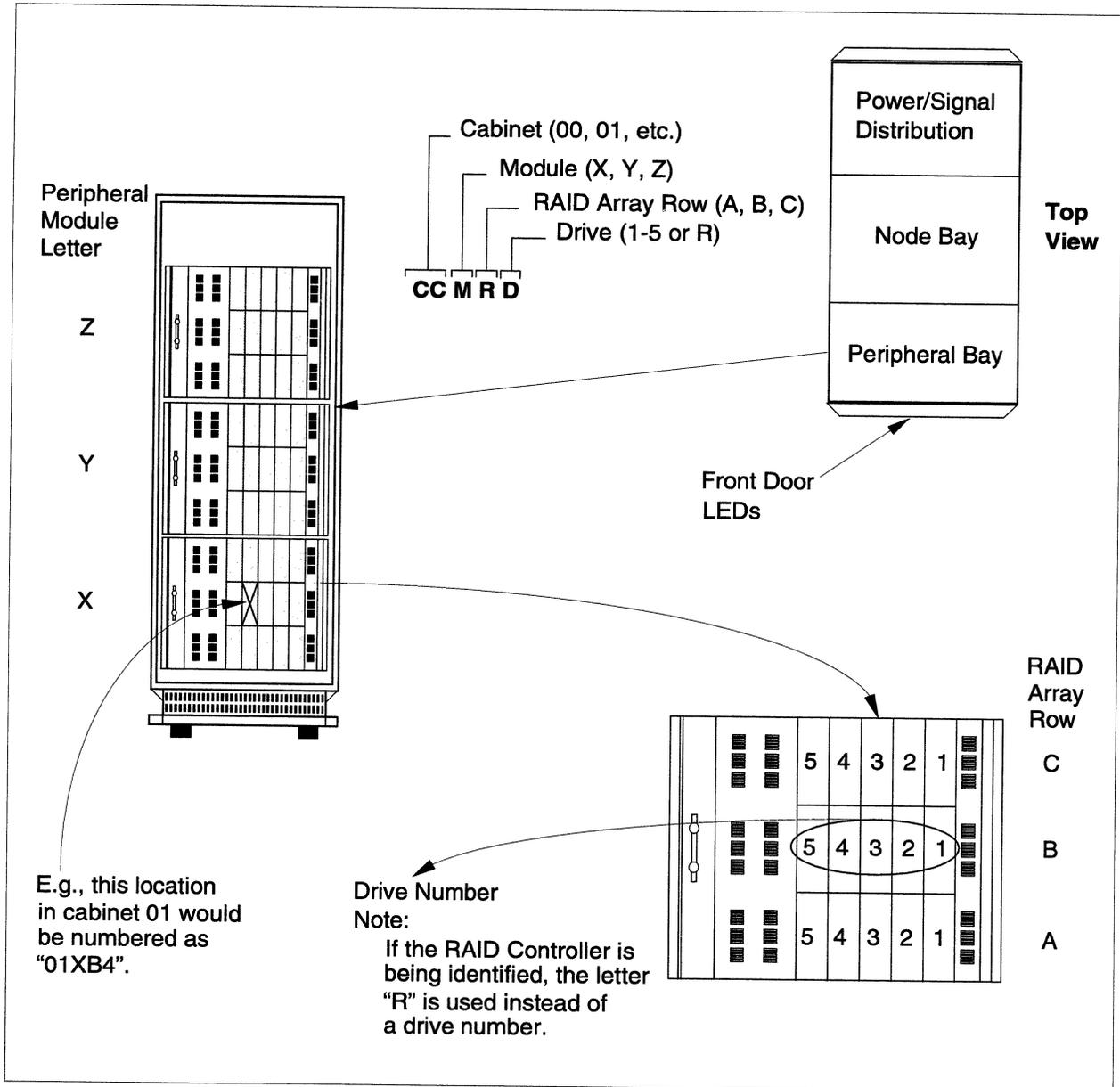
Figure 3-17. Physical Numbering System for Disk Drives

Configuring the Disk/Tape Drives

You must confirm that any hard disk or tape drives being installed in a Paragon XP/S system peripheral module are properly configured. There are currently two DAT tape drive models and three SCSI hard disk drive models that are qualified for installation in a Paragon XP/S system peripheral module. The configuration process for these drives involves the following processes:

- Verify proper jumper selections on either the SCSI hard disk drive or the DAT tape drive.

- Verify proper option switch selections on the DAT tape drive.

- Verify the presence or absence of termination resistors on the drive, as necessary.

The following subsections apply to each of the qualified drives for the Paragon XP/S system peripheral modules. Refer to the subsection that applies to the drive being installed, then configure the drive as described.

Configuring 1.2G-Byte Maxtor Hard Disk Drives

The 1.2G-byte Maxtor hard disk drive is the drive used in the RAID arrays of earlier Paragon XP/S systems. This is a 3.5-inch disk drive that is installed as one of five drives in a RAID array. All drives in a given five-drive array must be of the same capacity, and should also be the same model (i.e., all 1.2G-byte Maxtor drives in an array). Each drive must be set up with a SCSI ID of "0", parity enabled, and with single ended operation enabled. In addition, each installed RAID drive must have termination resistors installed. Refer to Figure 3-18 on page 3-28 for detailed configuration information on the Maxtor 1.2G-byte hard disk drive.

Back

Notes:

1. Jumpers are installed to set the default SCSI ID of this drive. In RAID applications for the Paragon XP/S system, no SCSI ID jumpers (SCSI ID of "0") are installed. A jumper is installed at J6 7-8 to enable parity.
2. Termination resistors must installed in the location and orientation shown.
3. The jumper installed at J7 3-4 sets the drive up for single-ended (instead of differential) SCSI I/O signals.
4. Jumper blocks JP1, JP2, JP4, and JP5 are for manufacturing only. There should be only one jumper installed in any of these blocks, at JP4 2-4.

Figure 3-18. Configuring the Maxtor 1.2G-Byte Hard Disk Drive

Configuring 1.0G-Byte Seagate Hard Disk Drives

The 1.0G-byte Seagate hard disk drive is the drive used in the RAID arrays of newer Paragon XP/S systems. The 1.0G-byte drive was adopted to allow the Paragon XP/S system to use the cardinal-sized drives that have become industry standards. The 1.0G-byte drive can also be installed in the Paragon diagnostic station. In RAID applications, this is a 3.5-inch disk drive that is installed as one of five drives in a RAID array. All drives in a given array must be of the same capacity, and should also be the same model (i.e., all 1.0G-byte Seagate drives in an array). Each drive must be set up with a SCSI ID of "0", the "Sync Spindle" jumper installed, motor start on command enabled, parity enabled, and with terminators enabled. Refer to Figure 3-19 on page 3-29 for detailed configuration information on the Seagate 1.0G-byte hard disk drive.
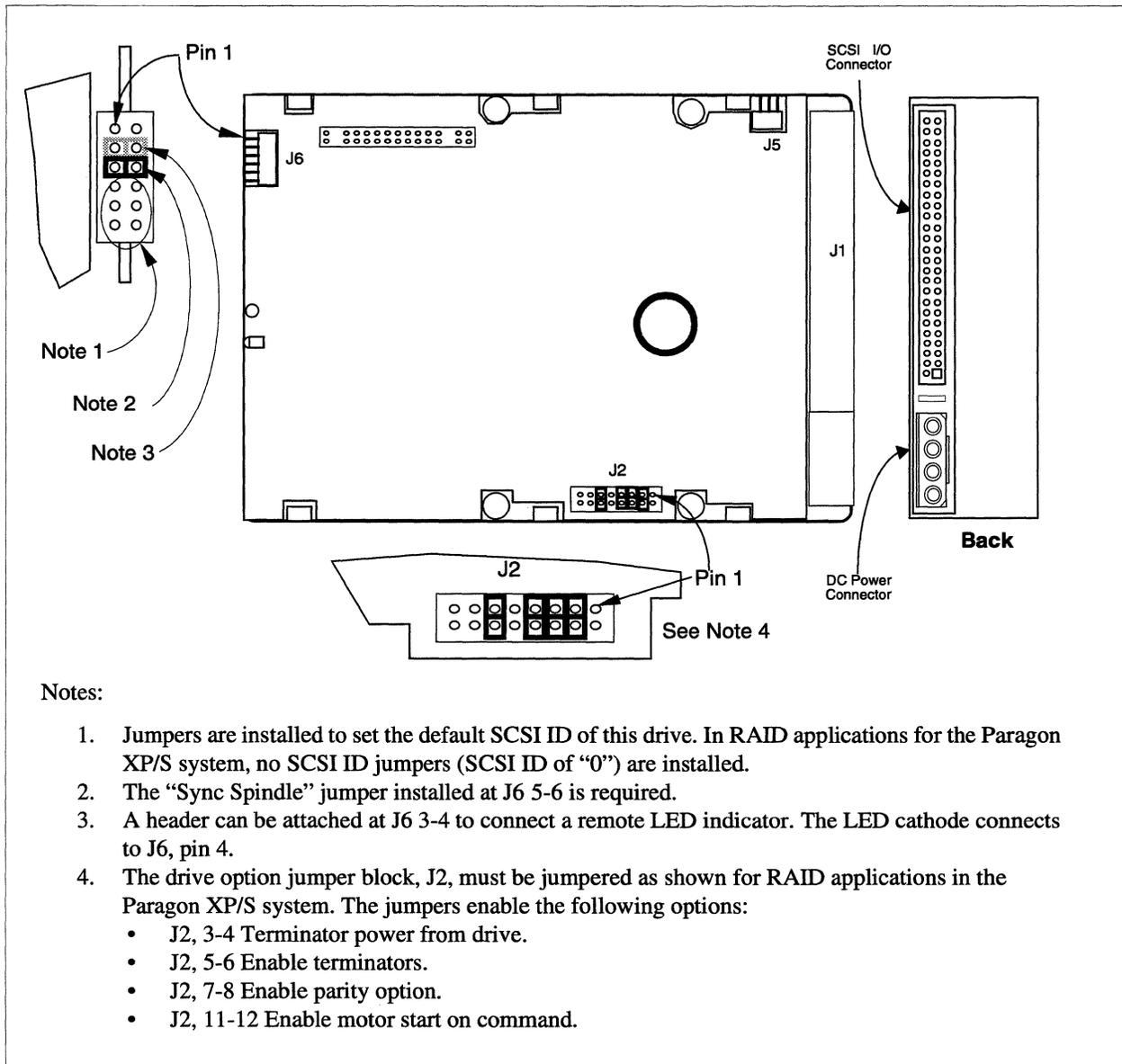
Figure 3-19. Configuring the Seagate 1.0G-Byte Hard Disk Drive

Notes:

1. Jumpers are installed to set the default SCSI ID of this drive. In RAID applications for the Paragon XP/S system, no SCSI ID jumpers (SCSI ID of "0") are installed.
2. The "Sync Spindle" jumper installed at J6 5-6 is required.
3. A header can be attached at J6 3-4 to connect a remote LED indicator. The LED cathode connects to J6, pin 4.
4. The drive option jumper block, J2, must be jumpered as shown for RAID applications in the Paragon XP/S system. The jumpers enable the following options:
   - J2, 3-4 Terminator power from drive.
   - J2, 5-6 Enable terminators.
   - J2, 7-8 Enable parity option.
   - J2, 11-12 Enable motor start on command.

Configuring 4.0G-Byte Seagate Hard Disk Drives

The 4.0G-byte Seagate hard disk drive is used in the RAID arrays of newer Paragon XP/S systems. This is a 3.5-inch disk drive that is installed as one of five drives in a RAID array. All drives in a given array must be of the same capacity, and should also be the same model (i.e., all 4.0G-byte

Seagate drives in an array). Each drive must be set up with a SCSI ID of "0", terminators enabled, motor start on command enabled, parity enabled, and with terminator power from the drive selected. Refer to Figure 3-20 on page 3-30 for detailed configuration information on the Seagate 4.0G-byte hard disk drive.

Notes:

1. Jumpers are installed to set the default SCSI ID of this drive. In RAID applications for the Paragon XP/S system, no SCSI ID jumpers (SCSI ID of "0") are installed.
2. A header can be attached at J6 3-4 to a remote LED indicator. The LED cathode connects to J6, pin 4.
3. Shipped with cover installed. These jumper pairs, plus J6 1-2 and J6 5-6, are reserved.
4. The drive option jumper block, J2, must be jumpered as shown for RAID applications in the Paragon XP/S system. The jumpers enable the following options:
   • J2, 3-4 Terminator power from drive.
   • J2, 7-8 Enable parity option.
   • J2, 11-12 Enable motor start on command.
   • J2, 15-16 Enable terminators.

Figure 3-20. Configuring the Seagate 4.0G-Byte Hard Disk Drive

Configuring HP Model 35470 DAT Tape Drives

The HP Model 35470 DAT tape drive is the drive used in earlier Paragon XP/S systems. This drive is normally installed above a RAID array in the peripheral module. The first DAT drive in the peripheral module is normally set up with a SCSI ID of "6" and with all option switches set to "ON". If installed, a second DAT drive will have a SCSI ID of "5", and any subsequent drives will have successively lower SCSI ID numbers (and, therefore, lower arbitration priority). In addition, a DAT tape drive must have termination resistors installed if it is the end device on the SCSI bus. Refer to Figure 3-21 on page 3-31 for detailed configuration information on the HP Model 35470 DAT tape drive.

Back   **Front**

Notes:

1.   Option switches 1 through 8 are all set to "ON", as indicated, for Paragon XP/S system applications.
2.   Jumpers are installed, as indicated, to set the default SCSI ID of this drive to "6". Possible SCSI ID settings (0 = no jumper, 1 = jumper installed) are as follow:

SCSI ID	Bit 2	Bit 1	Bit 0	SCSI ID	Bit 2	Bit 1	Bit 0
0	0	0	0	4	1	0	0
1	0	0	1	5	1	0	1
2	0	1	0	6	1	1	0
3	0	1	1	7	1	1	1

3.   Termination resistor SIP's must be installed in the indicated locations when the drive is installed as the end device on the SCSI bus. Ensure SIP pin 1 is oriented as indicated on the drive back panel.

Figure 3-21. Configuring the HP Model 35470 DAT Tape Drive

Configuring HP Model C1533 DAT Tape Drives

The HP Model C1533 DAT tape drive is a faster drive than the Model 35470 drive used in earlier Paragon XP/S systems. This drive is normally installed above a RAID array in the peripheral module. The first DAT drive in the peripheral module is normally set up with a SCSI ID of "6". If installed, a second DAT drive will have a SCSI ID of "5", and any subsequent drives will have successively lower SCSI ID numbers (and, therefore, lower arbitration priority). In addition, this DAT tape drive must have external termination resistors installed if it is the end device on the SCSI bus. Refer to Figure 3-22 on page 3-32 for detailed configuration information on the HP Model C1533 DAT tape drive.

Back   **Front**

Notes:

1. Jumpers are installed as indicated to set the default SCSI ID of this drive to "6". Possible SCSI ID settings (0 = no jumper, 1 = jumper installed) are as follow:

SCSI ID	Bit 2	Bit 1	Bit 0	SCSI ID	Bit 2	Bit 1	Bit 0
0	0	0	0	4	1	0	0
1	0	0	1	5	1	0	1
2	0	1	0	6	1	1	0
3	0	1	1	7	1	1	1

2. Terminator power is enabled using the indicated jumper. External terminators must be used.
3. With Option switch 1 OFF and switch 2 ON as indicated, compression is disabled at power-on and the host is allowed to control compression.
4. With Option switch 3 OFF as indicated, the Media Recognition System is active. Non-Media Recognition System tapes are treated as if they are write-protected.

Figure 3-22. Configuring the HP Model C1533 DAT Tape Drive

Installing Drives in the Peripheral Module

The Paragon XP/S system peripheral module can contain SCSI hard disk drives (in a RAID array) and DAT tape drives. The SCSI hard disk drives are first installed in a drive carrier before being mounted in the peripheral module. One or more DAT tape drives are first installed in a drive skid, and the skid is then mounted in the peripheral module. The following sections provide detailed procedures for installing or replacing drives in the peripheral module.

SCSI Hard Disk Drives

Refer to Figure 3-23 on page 3-34 and Figure 3-25 on page 3-37 while performing the procedures in this section. Perform the following steps to remove and/or install a SCSI hard disk drive from the Paragon XP/S system peripheral module:

1. Make sure the DC power has been turned OFF for this cabinet. Refer to the *Paragon*™ *System Administrator's Guide* for an appropriate power-down procedure for the cabinet.

2.   Loosen the screw at the base of the drive carrier, and pull the drive carrier out of the cabinet using the drive carrier's handles (see Figure 3-23). Place the carrier assembly on a stable, flat surface.
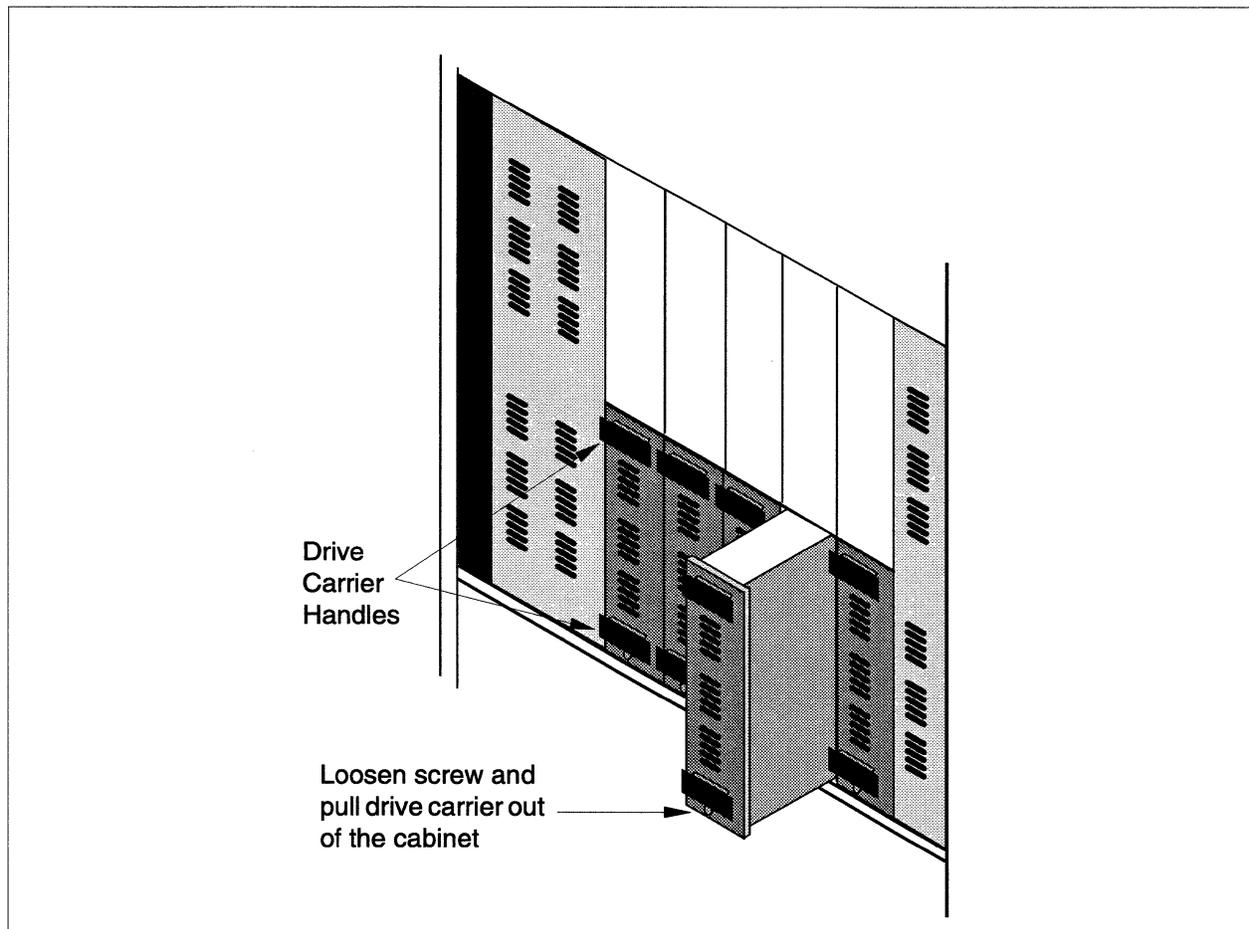
Figure 3-23. Removing a Drive from the Peripheral Module

3.   Unscrew the two screws holding the SCSI/DIN adapter board or the SCSI/DIN flex adapter to the drive carrier (see Figure 3-24).
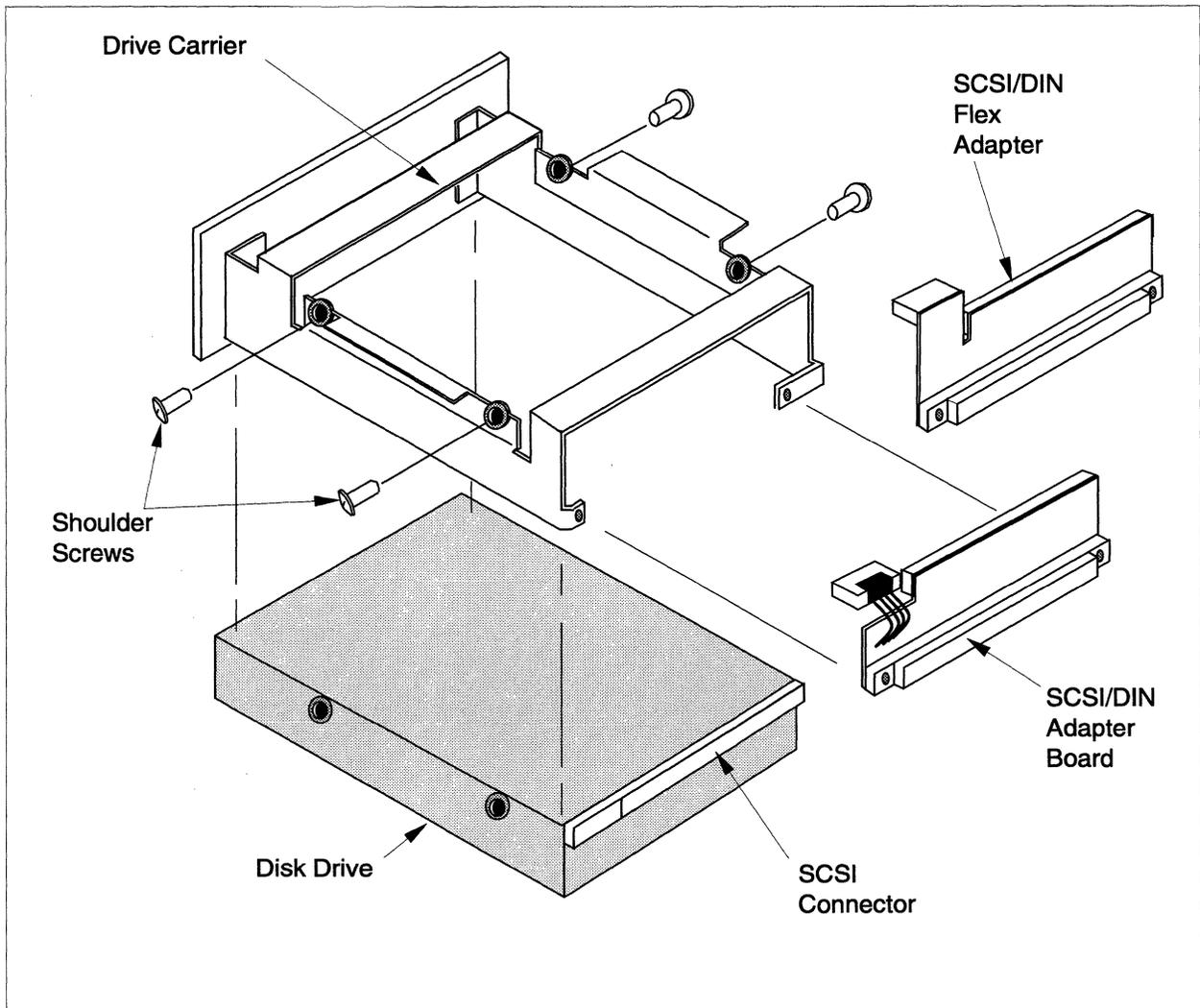
Figure 3-24. Removing a Drive from a Drive Carrier

NOTE

Earlier versions of the Paragon XP/S system used the SCSI/DIN adapter board, while newer and upgraded systems use the SCSI/DIN flex adapter. The functionality of both adapters is the same, but the SCSI/DIN flex adapter is the preferred component. If a Seagate 1.0G-byte or 4.0G-byte drive is being installed, the SCSI/DIN flex adapter MUST be used.

4.   Unplug the SCSI/DIN adapter board (or the SCSI/DIN flex adapter) from the drive, and remove the adaptor from the drive. Set the adaptor aside (see Figure 3-24).

5.   Remove the four shoulder screws holding the drive to the carrier (see Figure 3-24). Lift the drive carrier off of the drive.

6.   Verify that the new drive is properly configured. Refer to "Configuring 1.2G-Byte Maxtor Hard Disk Drives" on page 3-27, to "Configuring 1.0G-Byte Seagate Hard Disk Drives" on page 3-28, or to "Configuring 4.0G-Byte Seagate Hard Disk Drives" on page 3-29 for configuration information on the SCSI hard disk drive, if necessary.

7.   Place the drive carrier over the new drive and reattach it with the four shoulder screws.

8.   Reattach the SCSI/DIN adapter board (or the SCSI/DIN flex adapter), using the two screw holes to align the adapter with the drive. Plug the SCSI/DIN adapter board (or the SCSI/DIN flex adapter) into the new drive. Note that a SCSI/DIN flex adapter must be used with the Seagate 1.0G-byte or 4.0G-byte drive.

9.   Slide the drive carrier back into the RAID module assembly, and tighten the screw at the bottom of the drive carrier.

DAT Tape Drives

Refer to Figure 3-25 on page 3-37 and Figure 3-26 on page 3-38 while performing the procedures in this section. Perform the following steps to replace and/or install a DAT tape drive in the Paragon XP/S system peripheral module:

1.   Make sure the DC power has been turned OFF for this cabinet. Refer to the *Paragon*™ *System Administrator's Guide* for an appropriate power-down procedure for the cabinet.

2.   Remove the six screws securing the drive skid to the peripheral module.

3.   Pull the drive skid out of the cabinet using the drive skid's handles (see Figure 3-25).

4.   While supporting the skid with one hand, reach behind the drive skid with the other hand, and disconnect the power and SCSI connectors from any drives installed in the skid (see Figure 3-26).

5.   Place the skid assembly on a stable, flat surface.

6.   Remove the four securing screws holding the drive to the skid (see Figure 3-26). Slide the drive out of the drive skid (either through the front or through the rear of the skid.

7.   Verify that the new drive is properly configured. Refer to "Configuring HP Model 35470 DAT Tape Drives" on page 3-31 or to "Configuring HP Model C1533 DAT Tape Drives" on page 3-32 for configuration information on the DAT tape drive, if necessary.

Drive Skid
Handles

Loosen six screws
and pull drive skid
out of the cabinet
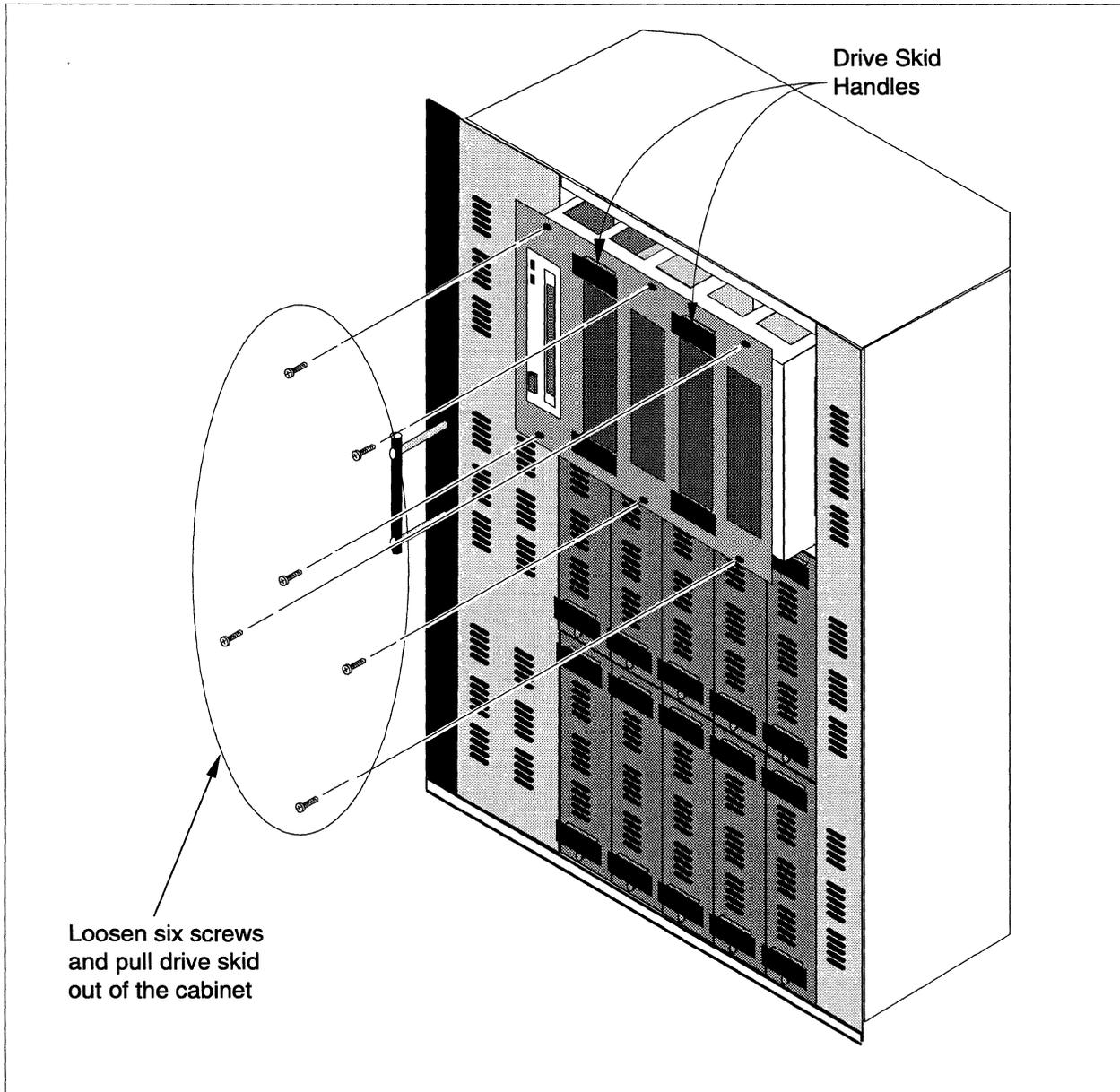
Figure 3-25. Removing the Drive Skid from the Peripheral Module

Securing screws
(two top,
two bottom)

Drive Power
Connector

SCSI
Connector

DAT Tape
Drive

Drive Skid

In-line Terminator
(used with HP
Model C1533 DAT
Tape Drive)
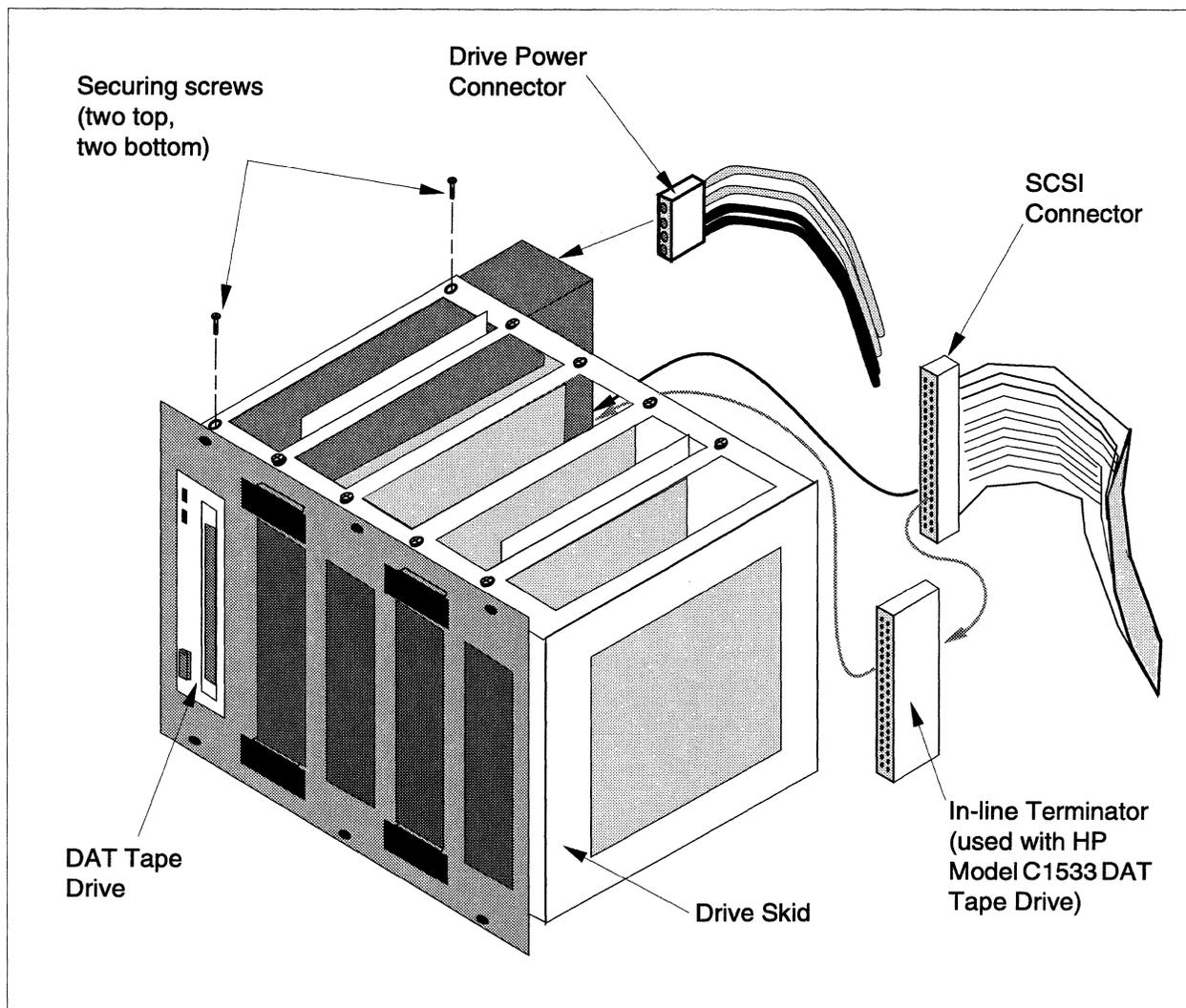
Figure 3-26. Replacing the Tape Drive in a Drive Skid

8. Slide the new tape drive into its slot in the drive skid, align the drive holes with those in the skid, and reattach it with the four securing screws.

9. Reattach the SCSI connector and the drive power connector to the mating connectors of the drive(s) in the skid.

10. Slide the drive skid back into the peripheral module assembly, and secure it using six screws as shown in Figure 3-25.

Attach External Cosmetic Cover Plates

If you have a multi-cabinet system, you need to attach external cosmetic cover plates wherever two cabinets are joined. As shown in Figure 3-27, one plate is attached at the front of the cabinets and the other plate is attached at the rear. To attach the cover plates, insert and tighten the four screws provided with each plate.
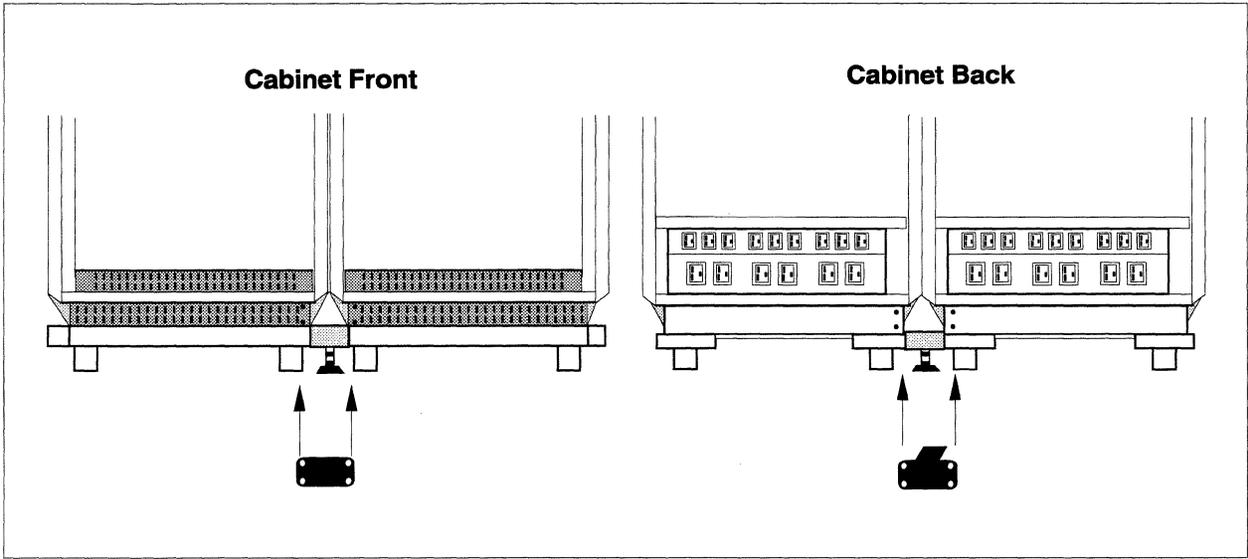
Figure 3-27. Attaching External Cosmetic Cover Plates

Apply Power to the System   4

Introduction

This chapter tells you how to apply power to the system and assumes that you have completed the hardware installation detailed in the previous three chapters.

This chapter does not tell you how to install or configure the system. For that, refer to the software product release notes for the Paragon™ XP/S system.

CAUTION

For installations outside the United States, be sure that you have the proper power plugs for the cabinets before you try to apply power to the system. For more information about these plugs and other electrical requirements, refer to the *Paragon*™ *System Site Preparation Guide.*

It is important to do the steps in this chapter in the order given. A Node Confidence Test (NCT) runs automatically when the Paragon XP/S system is turned on. If you encounter any problems performing these procedures, contact SSD Customer Support as discussed in the Preface.

Apply Power

To apply power to the system, do the following:

1. Make sure that the main circuit breakers on all the cabinets (shown in Figure 3-4 on page 3-7) are in the OFF position (down).

2. Verify that the AC power is on at the site and that the main power cords to the cabinets are secure.

3. Plug the AC power cord for each cabinet into its power receptacle.

4. Flip the circuit breaker at the bottom back of each cabinet to the ON position (refer to Figure 3-4 on page 3-7).

5. If the cabinet's power supply fans come on, go to the next step. If the fans don't come on, check the following:

CAUTION

To prevent unwanted power surges and consequent arcing from the plug contacts, turn off your circuit breakers before taking the following steps. You can turn the breakers back on once the power plugs have been checked.

A. Make sure the AC power cord of each cabinet is plugged into its power receptacle.

B. Make sure the cabinet main circuit breaker (shown in Figure 3-4 on page 3-7) is OFF.

C. Open the rear door and ensure that all power cords plugged into the power channel (shown in Figure 3-4 on page 3-7) are firmly in place.

D. If the cabinet's power supply fans come on, turn the circuit breaker of each cabinet ON and go to the next step.

E. If the cabinet power supply fans don't come on (and if the cabinet is receiving power), STOP the power-up procedure, shut the system down (unplug each cabinet), and call SSD Customer Support.

6. Press the ON button on the power controller board (Figure 4-1). If your system has multiple cabinets, pressing the ON button of any of the power controller boards powers up all cabinets. (The controller board is located on the inside of the back of the cabinet, on the top left corner.)

7. If any of the red LEDs on this power controller board light, STOP the power-up procedure and call SSD Customer Support.
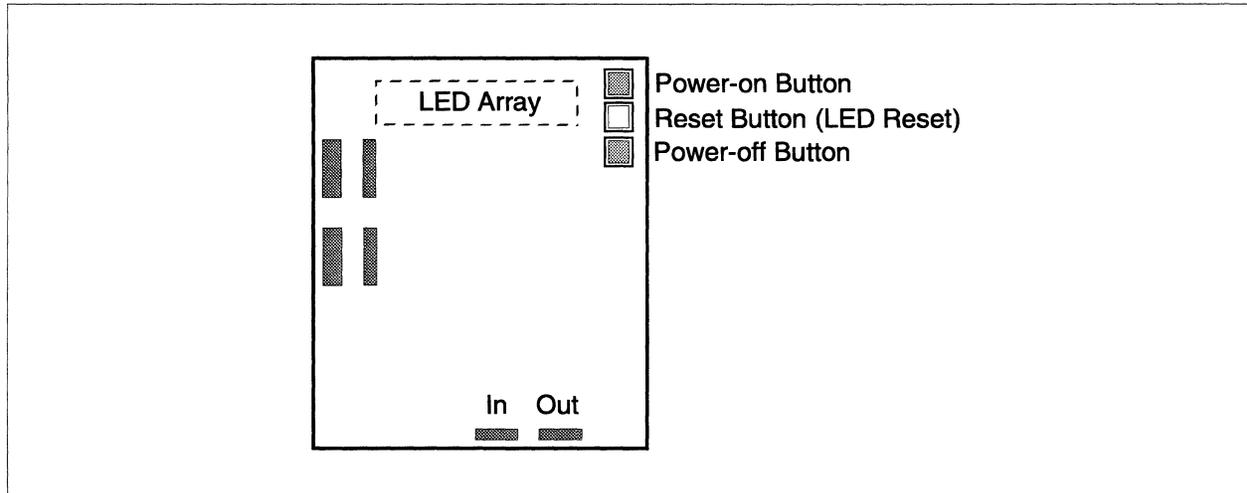
Figure 4-1. Power Controller Board On/Off Switch Locations

8. If this is a multi-cabinet Paragon XP/S system, verify that the red LEDs for the other cabinets (in the upper left corner of the front door) are NOT lit. If any of these red LEDs are lit, STOP the power-up procedure and call SSD Customer Support.

9. The Node Confidence Test (NCT) is automatically executed at power-up. Move to the front of the cabinets and verify that the front panel red and green LEDs of the node boards come on as the NCT is executed in parallel on all nodes. When a node passes the test, the node's green LED begins blinking after about twenty seconds.

10. If neither indicator (red or green) is lit, call SSD Customer Support.

11. If the red indicator on any node board is blinking, call SSD Customer Support.

12. Move to the DS (diagnostic station). In multiple cabinet systems, the DS is located in the rightmost cabinet (as you face the front of the system). Open this door and swing out the DS. In the back of the DS you'll find a switch. Turn the DS switch on.

13. The green LED, located at the lower front of the DS, should come on, and a prompt should appear on the DS screen. If it does not, call SSD Customer Support.

What's Next

This completes hardware installation of the system. To bring up your software and configure it for your site, refer to the *Paragon*™ *System Software Release Notes for the Paragon*™ *XP/S System.*

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