RS/6000 SP

IBM

POWER3 SMP
High Node
Service Guide

RS/6000 SP

POWER3 SMP High Node Service Guide

> **Note!**
>
> Before using this information and the product it supports, read the safety information in the "Safety and environmental notices" on page xiii and the information in "Notices" on page X-1.

First Edition (October 1999)

This edition applies to Version 3 Release 1 Modification 1 of the IBM Parallel System Support Programs for AIX (PSSP) Licensed Program, program number 5765-D51, and to all subsequent releases and modifications until otherwise indicated in new editions.

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Safety and environmental notices

Safety notices (in English)

For general information concerning safety, refer to *Electrical Safety for IBM Customer Engineers* (S229-8124). For a copy of this publication, contact your IBM marketing representative or the IBM branch office serving your locality.

The following is a list of all safety notices (in English only) pertaining to SP hardware maintenance tasks from this and other RS/6000 SP node service guides. Translations of each of the safety notices into other languages are included in *RS/6000 SP: Installation and Relocation*

DANGER

> **Do not attempt to open the covers of the power supply. Power supplies are not serviceable and are to be replaced as a unit**

DANGER

> **An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.**
>
> **Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.**
>
> **When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.**
>
> **Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.**
>
> **During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.**

DANGER

> **In the U.S., Canada, and Japan, this product has a 4-wire power cable with a 4-prong plug. Use this power cable with a correctly grounded power receptacle to prevent possible electric shock.**

DANGER

> **Before you connect the power cable of this product to ac power, verify that the power receptacle is correctly grounded and has the correct voltage.**

DANGER

> **During an electrical storm, do not connect or disconnect any cable that has a conductive outer surface or a conductive connector.**

DANGER

> **Switch off power and unplug the machine power cable from the power receptacle, before removing or installing any part that is connected to primary power.**

DANGER

> **To prevent possible electrical shock during machine installation, relocation, or reconfiguration, connect the primary power cable only after connecting all electrical signal cables.**

DANGER

> **High voltage present. Perform "Lockout safety procedures" to remove primary power to the frame.**

DANGER

> **High voltage present. Perform "Lockout safety procedures" to remove primary power to the frame (and high-voltage transformer if present).**

DANGER

> **High voltage present at test points. Use high voltage test probes.**

DANGER

> **High energy present. Do not short 48V to frame or 48VRtn. Shorting will result in system outage and possible physical injury.**

DANGER

> **If a unique power module fails, all LEDs will be off. The high voltage LED will be off even though the high voltage is still present.**

DANGER

> **The remaining steps of the procedure contain measurements that are taken with power on. Remember that hazardous voltages are present.**

DANGER

> **The frame main circuit breaker and the controller must not be switched on again now.**
>
> **Before disconnecting the power cables from the power receptacles, ensure that the customer's branch distribution circuit breakers (customer power source circuit breakers) are Off and tagged with DO NOT OPERATE tags, S229-0237. Refer to "Lockout safety procedures" before proceeding.**

DANGER

> **Before connecting AC power cords to electrical outlets, ensure that:**
>
> - **The customer's branch distribution circuit breakers (customer power source circuit breakers) are off and tagged with DO NOT OPERATE tags, S229-0237 (or national language equivalent).**
> - **The activities in "Performing the Customer 50/60 Hz Power Receptacle Safety Check" have been performed on all customer power source outlets and cable connectors.**

DANGER

> **Ensure that the customer's branch distribution circuit breakers (customer power source circuit breakers) to the AC power outlets are off and tagged with DO NOT OPERATE tags, S229-0237 (or national language equivalent).**

DANGER

> **Both the SEPBU power chassis and the PDU 48V power chassis are field replaceable units (FRUs) which contain NO serviceable parts; they are labeled as such. Do not attempt to isolate or repair these components, since doing so may result in severe injury or even death.**

CAUTION:

The weight of the PDU assembly, 48 V dc power chassis, and the SEPBU power chassis is greater than 18 Kg (40 lbs). Be careful when removing or installing. Remove all 48 V dc power supplies from the power chassis before removing or installing the power chassis.

CAUTION:

The unit weight exceeds 18 Kg (40 lbs) and requires two service personnel to lift.

CAUTION:

The covers are to be closed at all times except for service by trained service personnel.

CAUTION:

When the unit is being serviced, the covers should not be left off or opened while the machine is running unattended.

CAUTION:

Due to weight of each thin node (under 18 Kg [40 lbs]), use care when removing and replacing thin nodes above shoulder height.

CAUTION:

The wide node weight may exceed 32 Kg (70.5 lbs).

CAUTION:

Do not open more than one wide node or switch assembly drawer at a time.

CAUTION:

Make sure the stability foot and wheel chocks are installed on the frame. These are required to maintain frame balance and position during service operations.

CAUTION:

Outer edges of chassis may be sharp. Care must be taken when removing and installing chassis.

CAUTION:

The ground strip may have sharp edges.

CAUTION:

Do not remove wide nodes or switch assemblies from the mounting slides. Caution must be observed when working with mounting slides to prevent pinched fingers or accidental release of the unit.

CAUTION:

Do not remove the drawer case mounting screws at the bottom of both sides.

CAUTION:

Once the latch is released, push the drawer closed. Do not pull, as the drawer may disengage from the rails, creating a safety hazard.

CAUTION:

Due to the weight of each wide node, use care when sliding and closing wide processor nodes above shoulder height.

CAUTION:

- When moving frames into position, team members should work together. Using one person on each corner of the frame can prevent strain.
- In raised floor installations, mechanically safe moldings should be installed around floor cutouts. Extreme caution should be used when moving frames during installation or removal because of the proximity of floor cutouts to casters.

CAUTION:

A Johnson bar (J-bar) or similar device must not be used at any time to lift or move frames.

CAUTION:

When using step ladder or step stool, be sure that the work surface is level and the step ladder or step stool is in good working order.

CAUTION:

Portable ladders present a serious safety hazard if not used properly. Follow these general guidelines:

- **Make sure the ladder is firm and steady, and has no defective rungs or braces.**
- **Work only on a level surface.**
- **Never use a metal ladder near electrical power lines.**
- **Never overreach. Instead, move the ladder.**

Be as careful on a short ladder as on a 30-foot extension ladder. False security can lead to carelessness and falls which can cause painful injuries.

Personal ESD requirements

The processor uses FRUs that are known to be sensitive to electrostatic discharge (ESD). To prevent ESD damage to FRUs or to prevent system failures, observe the following procedures:

- Keep the FRU in its original static-dissipative shipping container until the FRU is ready to be installed in the system. Move the static-dissipative container near the location where the FRU is to be installed (within ESD wrist strap distance). If the FRU must be put down for any reason, first place it in its static-dissipative container or place it on the static-dissipative mat.

- Open only the covers that are necessary to complete the task. Any time a cover is open the service representative and all people in the area must be ESD-safe. If power is switched on, or if removing or exchanging any FRU, always use the ESD kit (part 93F2649).

  1. Put on the ESD wrist strap.
  2. Attach the ESD cord to the wrist strap.
  3. Attach the ESD mat to the wrist strap, if required.
  4. Attach the insulated clip to the ESD cord.
  5. Attach the insulated clip to the frame holes labeled **ESD**. If the frame holes are not available, use a grounding point on the frame.

About this book

This book is to help you, as a customer engineer, diagnose and repair an RS/6000 SP POWER3 SMP High Node by performing the following tasks:

- Identify field replaceable unit (FRU) locations
- Isolate RS/6000 SP failures using Maintenance Analysis Procedures (MAPs)
- Perform diagnostic service procedures
- Perform removal and replacement procedures
- Identify FRUs and their corresponding part numbers

RS/6000 SP hardware service library

Beginning with this release, *Maintenance Information Volumes 1-4* (GA22-7375, GA22-7376, GA22-7377, and GA22-7378) have been restructured into the following publications:

- *IBM RS/6000 SP: Installation and Relocation*, GA22-7441. Installation and relocation procedures, maintenance agreement and qualification procedures, frame and component identification information.

- *IBM RS/6000 SP: System Service Guide*, GA22-7442. General SP system service procedures, the system Start MAP, and MAPs and parts catalog for the frames and power subsystems. Use this book to begin a diagnostic procedure to isolate a problem to a specific major component of the SP system.

- *IBM RS/6000 SP: SP Switch Service Guide*, GA22-7443. Service procedures, MAPs, and parts catalog information specific to the SP Switch.

- *IBM RS/6000 SP: Uniprocessor Node Service Guide*, GA22-7445. Service procedures, MAPs, and parts catalog information specific to all uniprocessor-type nodes.

- *IBM RS/6000: 604 and 604e SMP High Node Service Guide*, GA22-7446. Service procedures, MAPs, and parts catalog information specific to these nodes.

- *IBM RS/6000 SP: SMP Thin and Wide Node Service Guide*, GA22-7447. Service procedures, MAPs, and parts catalog information specific to these nodes.

- *IBM RS/6000 SP: POWER3 SMP High Node Service Guide*, GA22-7448. Service procedures, MAPs, and parts catalog information specific to this node (this book).

As an alternative to ordering the individual books, you can use GBOF-5437 to order the complete RS6000 SP hardware service library.

For a complete list of other SP system publications and related information, see the bibliography section of *RS/6000 SP: Installation and Relocation*, GA22-7441.

Who should use this book

This book is intended for the product-trained Customer Engineer (CE). The installation procedures for RS/6000 SP and feature components described in this book represent a part of the overall support structure of the RS/6000 SP product.

User responsibilities

Before calling the IBM customer engineer, the system administrator should use the problem determination section of the *IBM Parallel System Support Programs for AIX: Diagnosis Guide*, SC23-3866 for initial problem determination. If there is nothing wrong with the customer operating procedures, customer-supplied cables, or power source, the customer should call an IBM customer engineer.

How to use this book

This book is intended for product trained customer engineers only.

When performing RS/6000 SP maintenance, the CE must follow **all** "Maintenance Analysis Procedures" beginning with the Start MAPs in the *RS/6000 SP: System Service Guide*.

Beginning with the Start MAPs, isolate the problem to one or more of these RS/6000 SP components:

- Supervisor Subsystem
- Processor Node
- Power Subsystem
- High Voltage Transformer (World Trade)
- Ethernet Local Area Networks (LANs)
- PCI Adapter

Note: If the diagnostic procedures indicate that the problem is isolated to a POWER3 SMP High Node, the information in *RS/6000 SP: System Service Guide* will direct you to return to this book.

If you cannot determine the failure's cause, you should request the assistance of the RS/6000 SP Field Support Center.

Getting more information

This book and other RS/6000 SP hardware and software documentation are available both on-line and in printed form from the following sources:

- The RS/6000 website at **http://www.rs6000.ibm.com**

- The Resource Center on the PSSP product media

- The Service Information Library (SIL)

- Printed and CD-ROM versions (which can be ordered from IBM)

- IBM internal use versions available on MKTTOOLS

For more information on these sources and an extensive listing of RS/6000 SP related publications, see the bibliography section of *RS/6000 SP: Installation and Relocation*, GA22-7441.

Chapter 1. Maintenance analysis procedures (MAPs)

This chapter provides information for identifying problems and guides you to the most likely failed Field Replaceable Unit (FRU). The MAPs then refer you to the FRU Removal/Replacement procedures for the corrective action.

Lockout safety procedures

The following lockout safety procedures are used to electrically isolate the frame and ensure the safety of all service personnel while servicing this machine:

- For SEPBU equipped frames, refer to "SEPBU lockout procedures."

- For PDU equipped frames, refer to "PDU lockout/tagout procedure" on page 1-2.

SEPBU lockout procedures

Initial SEPBU lockout procedure: This procedure ensures that no power is present in the machine, and that primary power can not be accidentally applied. This procedure is referenced as required by the maintenance procedures.

Note: Be sure that the ac line cord is disconnected from the customer's main power outlet before attaching the cord to the SEPBU.

1. Make sure the **frame's** main power switch is in the Off ('0').

2. The following phase-to-phase ac voltage measurements are to be taken at the ac filter (located inside the rear cover at the bottom of the frame):

    - Between test points Z1 and Z2.

    - Between test points Z1 and Z3.

    - Between test points Z2 and Z3.

    Note: The purpose of these measurements is to guarantee that primary power is initially present at the test points. If the voltages measurements indicate that primary power is not present, have customer switch on power for this frame, then go back to Step 2 of the "Initial SEPBU lockout procedure."

3. Switch off frame circuit breaker (located inside rear cover near bottom) to disengage ac power inside frame.

4. Depending on your customer's safety requirements, you **must** perform either the "SEPBU lockout/tagout procedure" or the "SEPBU lockout/bagout procedure" on page 1-2 to completely isolate the frame from the electrical supply.

SEPBU lockout/tagout procedure: **After** completing the initial lockout procedure:

1. Have the customer switch off primary power to this frame from an **external** circuit breaker.

2. Verify that there is no power present by repeating the measurements made in Step 2 of the "Initial SEPBU lockout procedure."

    - If power is still present, inform customer of this fact and return to Step 4 of the "Initial SEPBU lockout procedure."

3. When the proper circuit breaker has been located, install a lock on the circuit breaker to lockout the circuit breaker.

- If a lock **is not** available, attach a DO NOT OPERATE tag (S229-0237) directly to the circuit breaker.

4. You may now perform maintenance on primary power components per the instructions.

SEPBU lockout/bagout procedure: **After** completing the initial lockout procedure:

1. Locate the power plug for this frame and remove the plug from the receptacle.

2. Verify that there is no power present by repeating the measurements made in Step 2 of the "Initial SEPBU lockout procedure" on page 1-1. If power **is** still present:

    a. Check with customer or other maintenance personnel **before reconnecting** the power plug you just removed.

    b. Return to Step 1 of "SEPBU lockout/bagout procedure" and locate the correct plug.

3. When the correct plug has been removed from the receptacle, install a safety lockout bag (part number 74F9606) over the plug and lock the bag closed.

4. You may now perform maintenance on primary power components per the instructions.

PDU lockout/tagout procedure

This procedure ensures that no power is present in the machine, and that primary power can not be accidentally applied. This procedure is referenced as required by the MAPs.

1. Use a multimeter with the pair of high-voltage probes (part number 93F2731). Set the multimeter to the highest ac voltage setting.

2. The following measurements are to be taken at the ac filter (located inside the rear cover at the bottom of the frame). Measure phase-to-phase ac voltage between test points O1 and O2. Repeat measurement for test points O1 and O3. Repeat measurement between test points O2 and O3.

3. The purpose here is to guarantee that initially primary power is present at the test points. If the voltages measured in Step 2 indicate that primary power is not present, have customer switch on power for this frame, then go back to Step 2.

4. Switch off frame circuit breaker (located inside rear cover near bottom) to disengage ac power inside frame.

5. Now have customer switch off primary power to this frame from an external circuit breaker.

6. Verify that there is no power present by repeating the measurements made in Step 2. If power is still present, inform customer of this fact and return to Step 4.

7. Now that the proper circuit breaker has been located, install a lock on this circuit breaker to lockout the circuit breaker, OR if a lock is not available, attach a DO NOT OPERATE tag (S229-0237) directly to the circuit breaker.

8. You may now perform maintenance on primary power components per the instructions.

PDU lockout/bagout procedure

This may be used as an alternative to the Lockout/Tagout Procedure to ensure that no power is present in the machine, and that primary power can not be accidentally applied. This procedure is also referenced as required by the MAPs.

1. Use a multimeter with the pair of high-voltage probes (part number 93F2731). Set the multimeter to the highest ac voltage setting.

2. The following measurements are to be taken at the ac filter (located inside the rear cover at the bottom of the frame). Measure phase-to-phase ac voltage between test points O1 and O2. Repeat measurement for test points O1 and O3. Repeat measurement between test points O2 and O3.

3. The purpose here is to guarantee that initially primary power is present at the test points. If the voltages measured in Step 2 indicate that primary power is not present, have customer switch on power for this frame, then go back to Step 2.

4. Switch off frame circuit breaker (located inside rear cover near bottom) to disengage ac power inside frame.

5. Now locate plug for this frame, and remove plug from receptacle.

6. Verify that there is no power present by repeating the measurements made in Step 2. If power is still present, check with customer or other maintenance personnel before reconnecting plug from Step 5. Return to Step 5 to locate the correct plug.

7. Now that the correct plug has been removed from the receptacle, install a safety lockout bag (part number 74F9606) over the plug and lock the bag closed.

8. You may now perform maintenance on primary power components per the instructions.

POWER3 SMP High Node MAPs

POWER3 SMP High Node environment (MAP 0370)

Note: Refer to "Service position procedures" on page 3-15 for placing processor nodes into the service position or for removing them from the service position.

Step 0370–001: You have detected an environmental problem that is affecting a processor node.

1. Did you use a system message or an observed condition during your initial diagnosis of the environmental problem?

   • If you used a message displayed by the system for your initial diagnosis, go to "Step 0370–002."

   • If you observed a system condition that led to your initial diagnosis, go to "Step 0370–005" on page 1-4.

Step 0370–002: A TTY message indicated "rc.powerfail" or when you issued the command **errpt -a | pg** the display indicated "Loss of Electric Power" associated with processor node.

1. Check the failing node's error log by issuing **errpt -a | pg** on the affected node's AIX window to check for "Loss of Power" or warning messages.

2. Does the message indicate a loss of power or that the power is off?

   • If yes, go to "Step 0370–004" on page 1-4.

   • If the message **does not** indicate that the power is off or that you have a power loss:

      a. If the message is a warning, go to "Step 0370–003" on page 1-4.

      b. If the message **is not** a warning, go to "Step 0370–005" on page 1-4.

POWER3 SMP High Node environment (MAP 0370)

Step 0370–003: The message you received was a warning.

1. Does the same message occur on more than one processor node?

   - If yes, notify the next level of support.

   - If the same message **does not** occur on more than one node, then no immediate service is required. At this point you can either:

     – Defer the service action until a later date.

     – Perform the service now by going to "Step 0370–004" and treating the warning message as a "Shutdown" or "Failure" message.

Step 0370–004: A serious environmental condition has been detected in the processor node.

Note: If service action has just been completed on this processor node, check for loose cables or shorted conditions in the processor node.

Based on the text of the message, use Table 1-1 to continue service.

Table 1-1. POWER3 SMP High Node environmental conditions	
Condition	**Action**
Any power loss message	Go to "Step 0370–005."
"...cooling problem..." or fan problem	Go to "Step 0370–007."
"...memory protect..."	Go to "Step 0370–010" on page 1-6.

Step 0370–005: You have observed a condition that indicates that a power problem exists.

1. Check the node supervisor green LED 1.

2. Is the node supervisor green LED 1 On or flashing?

   - If green LED 1 is On and it **is not** flashing, go to "Step 0370–006."

   - If green LED 1 is **flashing**, go to Main power (MAP 0450) in *RS/6000 SP: System Service Guide*.

   - If green LED 1 is **Off**, go to "POWER3 SMP High Node power (MAP 0380)" on page 1-7.

Step 0370–006: Green LED 1 is On and it **is not** flashing.

1. Check for airflow blockage, fan problems or other cooling problems with the node.

2. Do any of these problems exist?

   - If yes, go to "Step 0370–007."

   - If no:

     a. Verify that you have the correct processor node.

     b. Go to the Processor node diagnostics and descriptions (MAP 0130) in *RS/6000 SP: System Service Guide*.

Step 0370–007: You have detected a cooling or fan problem with a node.

1. Run the advanced diagnostics problem determination routine to obtain failure data.

2. Place the processor node into the service position.

3. Use Table 1-2 on page 1-5 to reseat or replace components.

Table   1-2. POWER3 SMP High Node service actions

Priority	Component	Action
1	Fan 1, 2, 3, 4, 5, 6 **Note:** See Figure 1-1 on page 1-6.	1. Check specified fan for blockage or loose cable connection. Refer to the error log utility on the service processor menu. 2. Fix any obvious problems. If none are found, continue at Priority 2. 3. Continue at "Step 0370–008" on page 1-5.
2	Fan 1, 2, 3, 4, 5, 6 **Note:** See Figure 1-1 on page 1-6.	1. Replace fan and/or cooling module as described in "FRU Removals and Replacements," "Removing a fan" on page 4-6. Refer to the error log utility on the service processor menu. 2. Fix any obvious problems. 3. Continue at "Step 0370–008" on page 1-5.
3	Fan Control Card	1. Replace card 2. Continue at "Step 0370–008" on page 1-5.
4	Fan and DASD power cable assembly	1. Replace assembly 2. Continue at "Step 0370–008" on page 1-5.
5	Power Planar	1. Replace assembly 2. Continue at "Step 0370–008" on page 1-5.
6	All replaced	Call next level of support.

Step 0370–008:   You have replaced or reseated a component.

1. Remove the processor node from the service position.

2. Reconnect all cables at the rear of the processor node.

3. Put the circuit breakers on the processor node into the On ('1') position.

4. Check the error log or SRN.

5. Does the problem still exist?

- If yes, go to "Step 0370–009."

- If no:

    a. You have resolved the problem.

    b. Go to the End of call procedures (MAP 0650) in the *RS/6000 SP: System Service Guide*.

Step 0370–009:   You have replaced or reseated a component but the problem still exists.

1. Put the circuit breakers on the processor node into the Off ('0') position.

2. Reinstall the previously removed component.

3. Return to "Step 0370–007" on page 1-4 to service the next highest priority component listed in Table 1-2.

POWER3 SMP High Node environment (MAP 0370)

Chassis assembly

Fan assembly

Filter cover
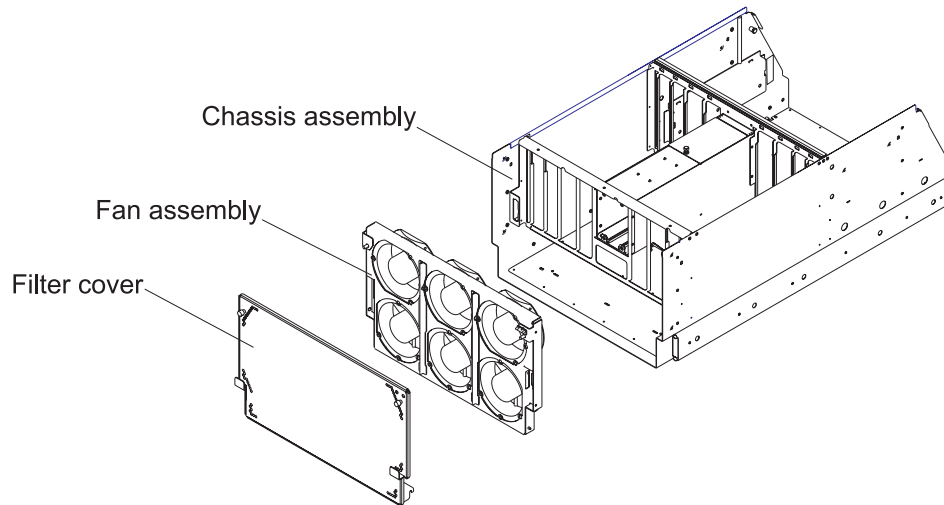
Figure   1-1. POWER3 SMP High Node fan layout

Step 0370–010:   You received a memory protection error and Table 1-1 on page 1-4 directed you to this location.

1. This fault is normally generated only when invalid memory cards are installed in the processor node.

2. Have memory parts been changed recently (since last successful IPL) in this processor node?

   - If yes, go to "Step 0370–012" on page 1-7.

   - If no, go to "Step 0370–011."

Step 0370–011:   You received a memory protection error but you **have not** changed any memory components.

1. Problem may be in the:

   - Base memory card

   - DIMMs

   - CPU card

   - System planar

   - Node supervisor card

2. Replace the listed parts, one at a time, until the problem is corrected or all components have been replaced.

3. Are you able to correct the problem?

   - If yes:

      a. You have resolved the problem.

      b. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide* book.

   - If no, call the next level of support.

Step 0370–012: You **changed** some memory components and now you are receiving a memory protection error.

1. Check memory card and DIMM part numbers shown in "Assembly 2: POWER3 Symmetric MultiProcessor (SMP) High Node asm (view 2)" on page 5-4.

   Note: Return to this procedure to continue service.

2. If necessary, call the next level of support.

POWER3 SMP High Node power (MAP 0380)

Note: When using this MAP, refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 and to "Removing a POWER3 SMP High Node from the service position" on page 3-16.

CAUTION:

The circuit breaker on the back of the node does not remove all 48-volt power from the inside of the node. To remove all 48-volt power from inside the node, the inline circuit breakers must also be turned off. With the circuit breakers on the back of the node turned off, 12-volts is still fed to the supervisor card through the supervisor cable.

Step 0380–001: You have a node with a power problem and the information in Processor node diagnostics and descriptions (MAP 0130) in *RS/6000 SP: System Service Guide* directed you to this procedure.

Before beginning this diagnostic procedure, the node must be powered **on**.

1. Make certain that all circuit breakers for this node including the power assembly (on back of node) and the 48-volt inline power cable breakers are in the On ('1') position.

2. Does this node have any SP Expansion I/O Units attached?

   - If yes, go to "Step 0380–002."

   - If no, go to "Step 0380–003" on page 1-8.

Step 0380–002: If the POWER3 SMP High Node has SP Expansion I/O Units attached, you must make certain that they are also powered **on**.

1. Ensure **all** circuit breakers including the power assembly breaker on the back of the SP Expansion I/O Units and the inline circuit breakers on the 48-volt power cables for all attached SP Expansion I/O Units are in the On ('1') position.

2. For proper operation, any SP Expansion I/O Unit attached to a given node must be powered up **before** power is applied to the node.

3. Were all SP Expansion I/O Unit circuit breakers turned on prior to turning on the node breakers?

   - If yes, go to "Step 0380–003" on page 1-8.

   - If no:

     a. Ensure that all SP Expansion I/O Units attached to the suspect node have been identified.

     b. Turn off **all** circuit breakers associated with the suspect node and its attached SP Expansion I/O Units.

     c. Turn on all SP Expansion I/O Unit circuit breakers.

     d. After **all** SP Expansion I/O Units are powered on:

POWER3 SMP High Node power (MAP 0380)

        1) Turn on the node 48-volt inline power cable circuit breakers

        2) Wait **at least** 30 seconds

        3) After waiting, turn on the power assembly circuit breaker on back of the node

    e. Go to "Step 0380–003."

Step 0380–003: Check the status of the LEDs on the node supervisor card. Use the information in Table 1-3 to determine which diagnostic steps you must use.

Table 1-3. POWER3 SMP High Node supervisor card led status					
LED Status					**Action**
LED 1 **(green)**	**LED 2** **(green)**	**LED 3** **(green)**	**LED 4** **(green)**	**LED 5** **(yellow)**	**Go To Step:**
Off	Off	Off	Off		"Step 0380–004"
Off	On	Off	Off		"Step 0380–010" on page 1-10
Flashing	On	Flashing	Off		"Step 0380–026" on page 1-14
Flashing	On	Off	Flashing		"Step 0380–028" on page 1-15
Flashing (see note)	On	Flashing	Flashing		"Step 0380–030" on page 1-16
On	On	On	On		"Step 0380–033" on page 1-17
				On or Flashing	"Step 0380–035" on page 1-17
Flashing	On	Flashing	Flashing	Flashing	"Step 0380–036" on page 1-17
Note: If Perspectives node failure is red, go to "Supervisory subsystems" MAPs in *RS/6000 SP: SP Switch Service Guide*.					

Step 0380–004: You have arrived at this point because all circuit breakers associated with the node and its SP Expansion I/O Units were in the On position and a visual examination of the node supervisor card LED's shows **all** green LED's are off.

1. Ensure that the supervisor cable is properly plugged into the node.

2. Ensure that the supervisor harness is properly plugged into the SEPBU.

3. Unplug the supervisor cable from the node.

4. Plug the supervisor cable back into the node and observe the LED's on the supervisor card.

5. Do any of the LED's on the supervisor card light?

- If yes, go to "Step 0380–009" on page 1-10.
- If no, go to "Step 0380–005."

Step 0380–005: After unplugging and then plugging the supervisor cable back into the node, all of the LEDs on the node supervisor card are still off. This indicates that the supervisor card may be at fault.

1. Replace the node supervisor card.
   - Refer to: "Removing the node supervisor card" on page 4-18 and "Replacing the node supervisor card" on page 4-19
2. Do any of the LED's on the supervisor card light?
   - If yes, go to "Step 0380–003" on page 1-8.
   - If no, go to "Step 0380–006."

Step 0380–006: You replaced the node supervisor card but the LED's on the supervisor card did not light.

1. Replace the PICO riser card.
   - Refer to "Removing the PICO riser card" on page 4-20 and "Replacing the PICO riser card" on page 4-20.
2. Do any of the LEDs on the supervisor card light?
   - If yes, go to "Step 0380–003" on page 1-8.
   - If no, go to "Step 0380–007."

Step 0380–007: You replaced the PICO riser card but the LED's on the supervisor card did not light.

1. Replace the I/O bulkhead card.
   - Refer to "Removing the I/O bulkhead card" on page 4-21 and "Replacing the I/O bulkhead card" on page 4-22.
2. Do any of the LEDs on the supervisor card light?
   - If yes, go to "Step 0380–003" on page 1-8.
   - If no, go to "Step 0380–008."

Step 0380–008: You replaced the I/O bulkhead card but the LED's on the supervisor card did not light.

1. Replace the I/O planar.
   - Refer to "Removing the node I/O planar" on page 4-25 and "Replacing the node I/O planar" on page 4-26.
2. Do any of the LEDs on the supervisor card light?
   - If yes, go to "Step 0380–003" on page 1-8.
   - If no, go to Scalable Electrical Power Base Unit diagnostics (MAP 0540) in *RS/6000 SP: System Service Guide*.

POWER3 SMP High Node power (MAP 0380)

Step 0380–009: After performing the procedure in "Step 0380–004" on page 1-8, you observed that some of the LEDs on the supervisor card were lit. This indicates that the 12 volt standby power is getting to the supervisor card.

1. Is LED 2 one of the LEDs that lit?

    • If yes:

        a. This indicates that the supervisor card has been reset.

        b. Note which green LEDs are lit.

        c. Return to Table 1-3 on page 1-8.

    • If no, go to "POWER3 SMP High Node control (MAP 0390)" on page 1-18.

Step 0380–010: You have arrived at this point because the circuit breaker on the back of the node and all in line circuit breakers are in the On position, **and** a visual examination of the node supervisor card green LED's indicated LED 2 was On and LED's 1, 3, and 4 were Off. This indicates the 12-volt supervisor voltage is On however the condition of the 48-volt supply is unknown.

1. Confirm that the 48-v power supply cables are connected at both ends.

2. If they are not already there, put the node's inline circuit breakers in the On position.

3. If they are not already there, put the circuit breakers on the back of the node in the On position.

4. Did you find any power cable **or** circuit breaker abnormalities **and** were you able to successfully correct them?

    • If yes:

        a. Observe the condition of the supervisor LED's

        b. Return to Table 1-3 on page 1-8.

    • If you **did not** find any power cable **or** circuit breaker abnormalities **or** if you tried to correct a circuit breaker abnormality and the circuit breaker tripped to the Off position, go to "Step 0380–011."

Step 0380–011: When you checked the node, either all of the power cables were connected and all circuit breakers were On **or** when you placed a circuit breaker into the On position, it tripped to the Off position.

• If all power cables were connected and the circuit breakers were in the On position, go to Scalable Electrical Power Base Unit diagnostics (MAP 0540) in *RS/6000 SP: System Service Guide*.

• If you placed a circuit breaker into the On position **and** it tripped to the Off position, go to "Step 0380–012."

Step 0380–012: When you placed a circuit breaker into the On position, it tripped to the Off position.

Attention: The 48-volt power cables have inline circuit breakers. Ensure the inline circuit breaker and the circuit breaker on the back of the node are in the Off position before connecting or disconnecting the 48-volt power cables from the node.

1. Check the 48-volt bulk power harness at the back of the node and the 48-volt bulk power connections for any obvious problems which might cause an electrical short.

2. Does everything appear to be okay?

    • If yes, go to "Step 0380–013" on page 1-11.

- If no:

    a. Fix the obvious problem.

    b. Return to "Step 0380–010" on page 1-10.

Step 0380–013:   You checked the 48-volt bulk power harness and connections but **did not** find any obvious problems.

1. Disconnect the 48-volt power cables from the node.

2. Using a multimeter, check for a short between pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel.

3. Did you detect an electrical short?

    - If yes, go to "Step 0380–015."

    - If no, go to "Step 0380–014."

Step 0380–014:   You **were not** able to detect an electrical short associated with the node's 48-volt bulk power subsystem.

1. Disconnect the 48-volt power cables from the SEPBU back panel.

2. Switch the inline circuit breakers to the On position.

3. Using a multimeter, check for electrical shorts in each cable.

4. If an electrical short is detected, replace the cable.

5. Switch the inline circuit breakers to the Off position and reinstall both power cables.

6. Return to "Step 0380–010" on page 1-10.

Step 0380–015:   You detected an electrical short associated with the node's 48-volt bulk power subsystem.

1. Ensure the circuit breaker on the back of the node is in the OFF position.

2. Access but **do not** remove the circuit breaker assembly.

    - Refer to, "Removing the circuit breaker assembly" on page 4-27.

    - Follow the first **three** steps to access the circuit breaker assembly.

3. Unplug P10 from the power planar.

4. Using a multimeter, check between pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel to see if the electrical short still exists.

5. Does the electrical short still exist?

    - If yes, go to "Step 0380–025" on page 1-14.

    - If no, go to "Step 0380–016."

Step 0380–016:   With P10 unplugged, you **do not** detect an electrical short between pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel.

1. Reconnect P10 to the power planar.

2. Confirm that the electrical short between the pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel has returned.

3. Unplug P3 from the power planar

POWER3 SMP High Node power (MAP 0380)

4. Does the electrical short still exist?

- If yes, go to "Step 0380–017."
- If no, go to "Step 0380–020."

Step 0380–017: With P3 unplugged, you still detect an electrical short between pins J1-1 and J1-2 and between J2-1 and J2-2 on the node rear panel.

1. Remove the following cards in order one at a time and check for the electrical short between the pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel:

   a. Fan Control - J21

   b. Power card - J19

   c. Power card - J18

   d. Power card - J17

   e. Power card - J15

   f. Power card - J14

   g. Power card - J13

   h. Power card - J11

2. Does the short still exist?

- If yes, go to "Step 0380–018."
- If no, go to "Step 0380–020"

Step 0380–018: The short still exists between the pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel.

1. Return to "Step 0380–017" and replace the next card on the list.

2. If all the cards last have been replaced, go to "Step 0380–019."

Step 0380–019: All cards were replaced and the short still exists between the pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel.

1. Replace the power planar.

2. Does the short still exist?

- If yes, contact the next level of support.
- If no, go to "Step 0380–020."

Step 0380–020: With P3 unplugged the short does not exist between the pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel.

1. Reconnect P3 to the power planar.

2. Confirm that the electrical short between the pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel has returned.

3. Does the electrical short still exist?

- If yes, go to "Step 0380–021" on page 1-13.
- If no, return to "Step 0380–002" on page 1-7.

Step 0380–021: With P3 plugged the short still exists between the pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel.

1. Unplug P22 to the system planar.

2. Confirm that the electrical short between the pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel does not exist.

3. Does the electrical short still exist?

   - If yes:

     a. Replace the 16-position system power cable.

     b. Return to the start of "Step 0380–021."

   - If no, go to "Step 0380–022."

Step 0380–022: With P22 unplugged, you do not detect an electrical short between pins J1-1 and J1-2 and between J2-1 and J2-2 on the node rear panel.

1. Reconnect P22 to the system planar.

2. Remove the following cards in order one at a time and check for the electrical short between the pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel:

   a. CPU Card C1 - J10

   b. CPU Card C2 - J07

   c. CPU Card C3 - J15

   d. CPU Card C4 - J19

3. Does the short still exist?

   - If yes, go to "Step 0380–023."

   - If no, return to "Step 0380–002" on page 1-7.

Step 0380–023: The short still exists between the pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel.

1. Return to "Step 0380–022" and replace the next card on the list.

2. If all the cards last have been replaced, go to "Step 0380–024"

Step 0380–024: All cards were replaced and the short still exists between the pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel.

1. Replace the system planar.

2. Does the short still exist?

   - If yes, contact the next level of support.

   - If no, return to "Step 0380–002" on page 1-7.

POWER3 SMP High Node power (MAP 0380)

Step 0380–025: With P10 unplugged, you are still detecting an electrical short between pins J1-1 and J1-2 and between J2-1 and J2-2 on the node back panel.

1. Replace the circuit breaker assembly.

    • Refer to "Removing the circuit breaker assembly" on page 4-27.

2. After replacing the circuit breaker assembly, use a multimeter and confirm that the electrical short between pins J1-1 and J1-2 and between pins J2-1 and J2-2 on the node back panel is gone.

3. Reconnect all cables at the back of the node and on the SEPBU.

4. Return to "Step 0380–002" on page 1-7.

Step 0380–026: You have arrived at this point because **all** circuit breakers associated with the node and its SP Expansion I/O Units are in the On position **and** a visual examination of the green LEDs on the node supervisor card shows that LED 2 is On. In addition, LED 1 and LED **3** are flashing, and LED **4** is Off. This indicates that the 48-volt supply cable connected to **J1** is okay but there is a problem with the 48-volt supply cable connected to **J2** .

1. Ensure that the 48-volt supply cable connected to **J2** is plugged properly at the node and at the SEPBU.

    Attention:

    The 48-volt power cables have inline circuit breakers. Ensure the inline circuit breakers and the circuit breaker on the back of the node are in the Off position before connecting or disconnecting the 48-volt power cables from the node.

2. Disconnect the power cable connected to **J2** at both ends of the cable.

3. Switch the breaker on the disconnected power cable to the On position.

4. Using a multimeter, check for continuity for each wire in the cable from end to end.

5. Does the cable have electrical continuity from end to end?

    • If yes, go to "Step 0380–027."

    • If the cable **does not** have electrical continuity:

        a. Replace the cable.

            – Make certain that you switch the inline circuit breaker to the **Off** position prior to installing the new power cable.

        b. Return to "Step 0380–003" on page 1-8.

Step 0380–027: The cable connected to **J2** has electrical continuity but LEDs 1 and 3 are flashing and LED 4 is off. You must determine whether the problem is in the SEPBU or the node supervisor card.

1. Turn off both inline circuit breakers and make certain that the node circuit breaker is still off.

2. Take the J2 cable you tested for continuity and plug the SEPBU end back into the SEPBU.

3. Swap the power cable connections **at** the node by:

    a. Unplug the node end of the J1 cable.

    b. Move the node end of the J1 cable to the node's J2 port.

    c. Plug the node end of the J2 cable into the node's J1 port.

4. Turn both inline circuit breakers back on.

5. Turn on the node circuit breaker.

6. Check the condition of LED 1, 3, and 4.

7. Has the condition of LED 1, 3, and 4 changed?

   - If yes, the problem is in the SEPBU. Go to Scalable Electrical Power Base Unit diagnostics (MAP 0540) in *RS/6000 SP: System Service Guide*.

   - If no:

     a. Replace the node supervisor card.

     b. Return to "Step 0380–003" on page 1-8.

Step 0380–028: You have arrived at this point because **all** circuit breakers associated with the node and its SP Expansion I/O Units are in the On position **and** a visual examination of the green LEDs on the node supervisor card shows that LED 2 is On. In addition, LED 1 and LED **4** are flashing, and LED **3** is Off. This indicates that the 48-volt supply cable connected to **J2** is okay but there is a problem with the 48-volt supply cable connected to **J1**.

1. Ensure that the 48-volt supply cable connected to **J1** is plugged properly at the node and at the SEPBU.

   Attention:

   The 48-volt power cables have inline circuit breakers. Ensure the inline circuit breakers and the circuit breaker on the back of the node are in the Off position before connecting or disconnecting the 48-volt power cables from the node.

2. Disconnect the power cable connected to **J1** at both ends of the cable.

3. Switch the breaker on the disconnected power cable to the On position.

4. Using a multimeter, check for continuity for each wire in the cable from end to end.

5. Does the cable have electrical continuity from end to end?

   - If yes, go to Scalable Electrical Power Base Unit diagnostics (MAP 0540) in *RS/6000 SP: System Service Guide*.

   - If the cable **does not** have electrical continuity:

     a. Replace the cable.

        – Make certain that you switch the inline circuit breakers to the Off position prior to installing the new power cable.

     b. Return to "Step 0380–003" on page 1-8.

Step 0380–029: The cable connected to **J1** has electrical continuity but LEDs 1 and 3 are flashing and LED 4 is off. You must determine whether the problem is in the SEPBU or the node supervisor card.

1. Turn off both inline circuit breakers and make certain that the node circuit breaker is still off.

2. Take the J1 cable you tested for continuity and plug the SEPBU end back into the SEPBU.

3. Swap the power cable connections **at** the node by:

   a. Unplug the node end of the J2 cable.

   b. Move the node end of the J2 cable to the node's J1 port.

   c. Plug the node end of the J1 cable into the node's J2 port.

4. Turn both inline circuit breakers back on.

5. Turn on the node circuit breaker.

POWER3 SMP High Node power (MAP 0380)

6. Check the condition of LED 1, 3, and 4.

7. Has the condition of LED 1, 3, and 4 changed?

 - If yes, the problem is in the SEPBU. Go to Scalable Electrical Power Base Unit diagnostics (MAP 0540) in *RS/6000 SP: System Service Guide*.

 - If no:

   a. Replace the node supervisor card.

   b. Return to "Step 0380–003" on page 1-8.

Step 0380–030: You have arrived at this point because a visual examination of the node supervisor card green LED's indicated LED 2 was on and LEDs 1, 3, and 4 were flashing. This indicates the supervisor voltage is On and 48-volts is available for the node. You must now determine if LEDs 1, 3, and 4 can be reset.

1. Ensure all circuit breakers for this node including the circuit breaker on the back of the node and the power cable circuit breakers are in the On position.

2. From the Control Work Station, open up a Perspectives window and power up the node.

3. Have LEDs 1, 3, and 4 been reset so that they are on but **not** flashing?

 - If yes, go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

 - If no, go to "Step 0380–031."

Step 0380–031: You were not able to reset LEDs 1, 3, and 4.

1. Switch the circuit breaker on the back of the node to the Off position

2. Wait one minute and switch the circuit breaker back to the On position.

3. Check the condition of the (green) node supervisor LEDs.

4. Are the LEDs on and **not** flashing?

 - If yes, go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

 - If no, go to "Step 0380–032."

Step 0380–032: The supervisor voltage is On and 48-volts is available for the node however, you **were not** able to reset the LEDs after toggling the node's circuit breaker.

1. Place the circuit breaker on the back of the node in the Off position.

2. Turn off **all** inline circuit breakers on **all** power cables attached to the node.

3. Disconnect **all** power cables from the back of the node.

4. Remove the top cover from the power assembly.

5. Perform the first **three** steps in "Removing the circuit breaker assembly" on page 4-27.

 - **Do not** remove the circuit breaker.

6. Unplug connector P10 from the power planar.

7. Place the circuit breaker on the back of the node in the On position.

8. Using a multimeter, check for continuity between:

 - Pin 1 on P10 to pin 1 on the **J1** power connector on the back of the node

 - Pin 2 on P10 to pin 1 on the **J2** power connector on the back of the node

9. Were **both** continuity measurements good?

- If yes:

  a. Replace the power planar.

     – Refer to "Replacing the Power Planar" in "Replacing the power planar" on page 4-31.

  b. Reassemble the node.

  c. Return to "Step 0380–002" on page 1-7.

- If **either** continuity measurement fails:

  a. Replace the node's circuit breaker assembly.

  b. Reassemble the node.

  c. Return to "Step 0380–002" on page 1-7.

Step 0380–033: You have arrived at this point because all circuit breakers associated with the node and its SP Expansion I/O Units were in the On position **and** a visual examination of the node supervisor card LEDs indicated (green) LEDs 1 , 2, 3, and 4 were On **and** (yellow) LED 5 is Off.

1. Do the fans ever drop out of the high speed (turbo) mode?

   - If yes, you have resolved the problem. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

   - If no, go to "Step 0380–034."

Step 0380–034: All green node supervisor LEDs are lit, LED 5 (yellow) is off, and the fans **do not** drop out of high speed mode. This indicates that the Service Processor and the Power Controller are not functioning.

1. Power off the node and replace the 5 volt Standby Power card.

   - Refer to "Removing a power card" on page 4-28.

2. Return to "Step 0380–002" on page 1-7.

Step 0380–035: You have arrived at this point because all circuit breakers associated with the node and its SP Expansion I/O Units were in the On position **and** a visual examination of the node supervisor card LEDs shows (yellow) LED 5 is either On or Flashing. There are two possible reasons for this condition:

1. The base code loaded on the node supervisor needs to be updated.

   - Refer to "Updating the node supervisor code" on page 3-15.

2. There is an environmental problem.

   - Go to "POWER3 SMP High Node environment (MAP 0370)" on page 1-3.

Step 0380–036: All circuit breakers associated with the node and its SP expansion I/O units are in the On position and a visual examination of the node supervisor card shows LED 2 is On, and LED's 1, 3, 4, **and 5** are flashing. In addition, you may have also noticed that the cooling fans were able to start and run at normal speed however the node **will not** boot. These symptoms indicate that a power cable may be loose or damaged.

1. Place the node in the service position.

2. Perform the **first three steps** in "Removing a power card" on page 4-28 to gain access to the power cables.

3. Make sure both ends of the following cables are properly plugged:

- Running from P3J3 to P1J22 (16 position system planar power cable)

- Running from P3J6 to P1J23 (26 position signal cable)

- Running from P3J7 to P1J24 (34 position signal cable)

4. Confirm that all other cables plugged into the power planar are properly attached.

5. Inspect all cables for damage due to chafing or bending problems caused during installation or service.

- Replace all damaged cables

6. **If:**

a. This is your first time through this step, return to "Step 0380–002" on page 1-7.

b. This is your second time through this step, go to "POWER3 SMP High Node environment (MAP 0370)" on page 1-3.

- If the problem persists **after** using diagnostic procedures in the POWER3 SMP High Node environment (MAP 0370), return to this procedure.

c. You are returning to this step from POWER3 SMP High Node environment (MAP 0370) because the problem still exists, go to "Step 0380–037."

Step 0380–037: The LED sequence on the node supervisor card indicated that you may have a power cable or planar problem. However, the problem still exists after you ran the diagnostics in POWER3 SMP High Node environment (MAP 0370). Replace the following parts in the order listed until the problem is fixed:

Note: After replacing a part, power the node on and check the LED status before replacing the next part. If you are able to boot the node, go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

1. Cable running from P3J3 to P1J22 (16 position system planar power cable)

2. Cable running from P3J6 to P1J23 (26 position signal cable)

3. Cable running from P3J7 to P1J24 (34 position signal cable)

4. Power planar, P3

5. System planar, P1

POWER3 SMP High Node control (MAP 0390)

Attention: If a POWER3 SMP High Node is present in this frame, it is possible that the 48-volt power distribution is spread across more than one power harness. Check physical connections from the circuit breakers to 48-volt bulkhead connectors for actual power distribution.

Attention: The processor nodes must be removed from active configuration before continuing. If the processor nodes are off, continue; otherwise, ask the customer to initiate shutdown procedure and power-off processor nodes from the control workstation, or defer maintenance until all jobs are completed. Powering off a processor node in a parallel environment will cause all jobs to flush from the queue and switch initialization to rerun.

Attention: Servicing a processor node with the Scalable POWERparallel Switch (SPS) feature installed, will impact the entire switch network, unless the processor node has already been powered off (or fenced) and the switch data cable has been disconnected.

Refer to "Service position procedures" on page 3-15 for placing or removing processor node(s) in/from service position.

Refer to "Viewing Switch Partitions" in *RS/6000 SP: SP Switch Service Guide* for locating and fencing/unfencing nodes within a switch partition.

Step 0390–001: You have detected an control problem that is affecting a processor node. Use Table 1-4 to continue service.

Table 1-4. POWER3 SMP High Node control diagnostics

Condition	Action
• Problem with node power	Go to "POWER3 SMP High Node environment (MAP 0370)" on page 1-3
• Perspectives "LCD and LED" display is missing segments or remains blank	Go to "Step 0390–022" on page 1-26
• Node will not reset	Go to "Step 0390–002"
• No response from TTY console	• Close existing TTY window and open another window • Go to "Step 0390–015" on page 1-23
• Yellow or green LEDs on node will not light.	Go to "Step 0390–025" on page 1-28

Step 0390–002: You are receiving control error messages from a node and the node **will not** reset.

1. Check with customer to make sure this processor node **is not** in the current active configuration.

    • If the processor node is not operational and actively working, continue service.

    • If the processor node is operational and actively working, schedule a time convenient for the customer.

2. Reset the nodes from Perspectives.

    a. From the control workstation, open a Hardware Perspectives session.

    b. Select the Node Status tab.

    c. Click the power off button.

    d. From the new window, select "Reset"

    e. Click "Apply"

3. Does processor node reset?

    • If yes, go to "Step 0390–003" on page 1-20.

    • If no, go to "Step 0390–004" on page 1-20.

POWER3 SMP High Node control (MAP 0390)

Step 0390–003: You were able to reset the node from Perspectives. This indicates that the problem is intermittent.

1. Please record following:

    - Node number
    - Date / Time fault reported
    - Type of fault reported.

2. Check the customer's written logs and ask the customer if this fault has been previously recorded.

    - If the records indicate that this is a recurring problem, go to "Step 0390–013" on page 1-22.

    - If you have no indication that this is a recurring problem, go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

Step 0390–004: The node did not reset from Perspectives.

1. Run the Perspectives reset sequence again, this time watch the node's LCDs for an indiction that the node IPL'd.

    a. From the control workstation, open a Hardware Perspectives session.

    b. Select the Node Status tab.

    c. Click the power off button.

    d. From the new window, select "Reset"

    e. Click "Apply"

2. Do the LCDs change?

    - If yes, go to "Step 0390–009" on page 1-21.

    - If no:

        a. The node supervisor card is not responding to commands.

        b. Go to "Step 0390–005."

Step 0390–005: You attempted to reset the node but the node did not IPL. This indicates that the node supervisor card is not responding to commands.

1. Replace the node supervisor card.

    - Refer to: "Removing the node supervisor card" on page 4-18 and "Replacing the node supervisor card" on page 4-19

2. Do any of the LEDs on the supervisor card light?

    - If yes, go to "Step 0390–009" on page 1-21.

    - If no, go to "Step 0390–006."

Step 0390–006: You replaced the node supervisor card but the node did not IPL.

1. Replace the PICO riser card.

    - Refer to "Removing the PICO riser card" on page 4-20 and "Replacing the PICO riser card" on page 4-20.

2. Do any of the LEDs on the supervisor card light?

    - If yes, go to "Step 0390–009" on page 1-21.

    - If no, go to "Step 0390–007" on page 1-21.

Step 0390–007: You replaced the PICO riser card but the node did not IPL.

1. Replace the I/O bulkhead card.

   - Refer to "Removing the I/O bulkhead card" on page 4-21 and "Replacing the I/O bulkhead card" on page 4-22.

2. Do any of the LEDs on the supervisor card light?

   - If yes, go to "Step 0390–009."

   - If no, go to "Step 0390–008."

Step 0390–008: You replaced the I/O bulkhead card but the node did not IPL.

1. Replace the I/O planar.

   - Refer to "Removing the node I/O planar" on page 4-25 and "Replacing the node I/O planar" on page 4-26.

2. Do any of the LEDs on the supervisor card light?

   - If yes, go to "Step 0390–009."

   - If no, go to Frame supervisor not responding (MAP 0110) in *RS/6000 SP: System Service Guide*.

Step 0390–009: Sequencing of the node's LCDs indicates the node was able to IPL.

1. Do LCDs eventually indicate completion of IPL sequence (i.e. blank or "uuu")?

   - If yes, go to "Step 0390–010."

   - If no:

     a. Processor node has problem IPLing.

     b. Go to Processor node function (MAP 0140) in *RS/6000 SP: System Service Guide* and refer to the table containing Perspectives diagnostic information to continue service.

Step 0390–010: The node's LCDs indicate that IPL went to completion.

1. From Perspectives, click on the TTY button to open a TTY session.

2. From the TTY session issue the command: **diag**

3. Select "Advanced Diagnostic Routines".

4. Select "System Verification".

5. Select "All Resources".

6. Does this test indicate a failure?

   - If yes, go to "Step 0390–013" on page 1-22.

   - If no, go to "Step 0390–011."

Step 0390–011: The advanced diagnostics system verification **did not** indicate a failure.

1. From the control workstation, reset the processor node.

2. Does the processor node reset?

   - If yes, go to "Step 0390–012" on page 1-22.

   - If no:

     a. There is a problem with reset.

POWER3 SMP High Node control (MAP 0390)

        b. Go to "Step 0390–013" on page 1-22.

Step 0390–012: You have found that the node reset is functioning properly from the control workstation.

1. Was this a solid problem? (If the problem was cleared by power-on only, answer No.)

    • If yes:

        a. You have resolved the problem.

        b. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

    • If no:

        a. This is an intermittent problem, record the following information:

            – Node number
            – Date / Time fault reported
            – Type of fault reported
            – Action taken or component replaced

        b. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

Step 0390–013: You have an intermittent problem **or** the advanced diagnostics system verification indicated a failure **or** you have a problem resetting the node. From Perspectives on the control workstation:

1. Power off the processor node.

2. Place the node into the service position.

3. Use Table 1-5 on page 1-23 to continue service:

Priority	Component	Action
Table 1-5. POWER3 SMP High Node advanced diagnostics		
1	Cable between frame supervisor and node supervisor card	1. Check for proper seating, open circuits or electrical shorts. 2. Repair or replace cable assembly as required. 3. Go to "Step 0390–014" on page 1-23 to verify fix. 4. If you **did not** find a problem with the cable, continue at Priority 2.
2	Node supervisor card	1. Replace node supervisor card if needed. 2. Go to "Step 0390–014" on page 1-23 to verify fix. 3. If you **did not** find a problem with the supervisor card, continue at Priority 3.
3	Pico Riser Card	1. Replace the riser card if needed. 2. Go to "Step 0390–014" on page 1-23 to verify fix. 3. If you **did not** find a problem with the riser card, continue at Priority 4.
4	Bulkhead Signal Cable 1 (at J12 on the I/O Planar)	1. Check for proper seating, open circuits, or electrical shorts. 2. Repair or replace components if needed. 3. Go to "Step 0390–014" on page 1-23 to verify fix. 4. If you **did not** find a problem with the bulkhead signal cable, continue at Priority 5.
5	Bulkhead Card	1. Replace bulkhead card if needed. 2. Go to "Step 0390–014" on page 1-23 to verify fix. 3. If you **did not** find a problem with the supervisor card, continue at Priority 6.
6	I/O Planar Board	1. Replace board. 2. Go to "Step 0390–014" on page 1-23 to verify fix. 3. If you **did not** find a problem, continue at Priority 7.
7	All replaced	Call next level of support.

Step 0390–014: You repaired or replaced a component as directed in Table 1-5.

1. Remove processor node from the service position.

2. Reconnect all cables at rear of the processor node.

3. Put the circuit breaker on the processor node into the On ('1') position.

4. Return to "Step 0390–009" on page 1-21 to continue service.

Step 0390–015: You were not able to obtain a response from a TTY session and Table 1-4 on page 1-19 directed you to this procedure.

1. From system file server, telnet into this processor node:

   telnet *nodename*

2. Log in as "root".

3. Have the customer check to make sure that the TTY port on the processor node is correctly defined.

   a. Check the console configuration by issuing the following command in the processor node's window:

   smit console

POWER3 SMP High Node control (MAP 0390)

- Use the menu options to check and reconfigure the console as required.

- If the console is not configured to use the TTY port, then the processor node will not print messages to the screen during IPL.

b. Check the TTY configuration by issuing the following command in the processor node's window:

smit tty

- Use the menu options to check and reconfigure the "s1" TTY port as required.

- The proper TTY parameters are listed in *IBM RS/6000 SP: Administration Guide*.

4. Is the TTY port defined properly, and the console setup to use the TTY port?

- If yes, go to "Step 0390–016."

- If the TTY **is not** responding due to the customer's system configuration:

a. The customer must reconfigure these parameters.

b. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

Step 0390–016: The TTY port is defined properly and the console is setup to use the TTY port however, the TTY session is not responding. This indicates that the problem is hardware related.

1. If a console TTY window is already open, close the session.

2. Log into the node over the Ethernet:

telnet *nodename*

3. In order to run the diagnostics on tty0, you must switch the console to tty1. Do this by entering the following command:

chcons /dev/tty1

4. Use the **diag** command to run regular (not advanced) diagnostics on "tty0".

5. Do the diagnostics pass (no problem found)?

- If yes, go to "Step 0390–019" on page 1-25.

- If no, go to "Step 0390–017."

Step 0390–017: The diagnostics failed after they were initiated from an Ethernet telnet session.

1. Run wrap diagnostics on S1 to node supervisor cable.

2. Do the diagnostics fail?

- If yes, go to "Step 0390–018."

- If no, go to "Step 0390–019" on page 1-25.

Step 0390–018: The diagnostics failed on the S1 to node supervisor cable.

1. Run wrap diagnostics on S1.

2. Do the diagnostics fail?

- If yes:

a. Replace I/O planar board.

b. Go to "Step 0390–020" on page 1-25.

- If no, go to "Step 0390–019" on page 1-25.

Step 0390–019: The node is properly configured but you are unable to get a response from the node through a TTY session. However, you were able to get the diagnostics to pass.

1. Return the console to tty0. Do this by entering the following command:

   chcons /dev/tty0

2. From the control workstation, open a Perspectives session displaying the Node Status window.

3. Close the TTY session.

4. Have the customer remove the processor node from the active system configuration and power off the processor node.

5. Put the circuit breaker on the processor node into the Off ('0') position.

6. Place processor node into the service position.

7. Refer to Table 1-6 for priority of replacement or repair of components.

Table 1-6. POWER3 SMP High Node reset diagnostics

Priority	Component	Action
1	Node supervisor card	1. Check for proper seating. If no problem found, continue at Priority 2. 2. Repair or replace cable assembly as required. 3. Go to "Step 0390–020" to verify fix.
2	Pico Riser Card	1. Replace the riser card if needed. 2. Go to "Step 0390–020" to verify fix. 3. If you **did not** find a problem with the riser card, continue at Priority 3.
3	Bulkhead Signal Cable 1 (at J12 on the I/O Planar)	1. Check for proper seating, open circuits, or electrical shorts. 2. Repair or replace components if needed. 3. Go to "Step 0390–020" to verify fix. 4. If you **did not** find a problem with the bulkhead signal cable, continue at Priority 4.
4	Bulkhead Card	1. Replace bulkhead card if needed. 2. Go to "Step 0390–020" to verify fix. 3. If you **did not** find a problem with the supervisor card, continue at Priority 5.
5	I/O planar	1. Replace I/O planar if needed. 2. Go to "Step 0390–020" to verify fix. 3. If you **did not** find a problem with the I/O planar, continue at Priority 6.
6	Cables between frame supervisor and node supervisor card	1. Replace cable. 2. Go to "Step 0390–020" to verify fix. 3. If you **did not** find a problem, continue at Priority 7.
7	All replaced	Call next level of support.

Step 0390–020: You have repaired or replaced a component.

1. Remove processor node from the service position.

2. Reconnect all cables at rear of the processor node.

3. As processor node completes IPL, check the TTY console window.

4. If necessary, open a Perspectives session displaying the Node Status window from the control workstation.

5. Put the processor node into the SERVICE **mode**.

6. Put the circuit breaker at the rear of the processor node in the On ('1') position.

7. Do you get any data on the TTY console screen?

- If yes, go to "Step 0390–021."

- If no:

   a. Return to "Step 0390–019" on page 1-25.

   b. Continue service at the next priority level.

Step 0390–021:   You repaired or replaced a component and you are now able to get data output from the TTY session. This indicates that the processor node IPLed in SERVICE **mode**.

1. From the TTY session, enter the command **diag**.

2. Select the "Advanced Diagnostic Routines".

3. Select "System Verification".

4. Select the "All Resources" option.

5. Does the processor node pass all diagnostic tests?

- If yes:

   a. You have resolved the problem.

   b. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

- If no:

   a. Repair the problem indicated by the diagnostics.

      – Use the information in Processor node diagnostics and descriptions (MAP 0130) in *RS/6000 SP: System Service Guide* if necessary.

Step 0390–022:   You have an LCD problem.

1. Have the customer remove the processor node from the active system configuration and power off the processor node.

2. Put the circuit breaker on the processor node into the Off ('0') position.

3. Place the processor node into the service position.

4. Refer to Table 1-7 on page 1-27 for priority of replacement or repair of components.

Table 1-7. POWER3 SMP High Node LCD diagnostics

Priority	Component	Action
1	Cable between frame supervisor and node supervisor card	1. Check for proper seating. 2. Repair or replace cable assembly as required. 3. Go to "Step 0390–023" on page 1-27 to verify fix. 4. If you **did not** find a problem with the riser card, continue at Priority 2.
2	Node supervisor card	1. Check for proper seating. 2. Repair or replace supervisor card as required. 3. Go to "Step 0390–023" on page 1-27 to verify fix. 4. If you **did not** find a problem with the riser card, continue at Priority 3.
3	Pico Riser Card	1. Replace the riser card if needed. 2. Go to "Step 0390–023" on page 1-27 to verify fix. 3. If you **did not** find a problem with the riser card, continue at Priority 4.
4	Bulkhead Signal Cable 1 (at J12 on the I/O Planar)	1. Check for proper seating, open circuits, or electrical shorts. 2. Repair or replace components if needed. 3. Go to "Step 0390–023" on page 1-27 to verify fix. 4. If you **did not** find a problem with the bulkhead signal cable, continue at Priority 5.
5	Bulkhead Card	1. Replace bulkhead card if needed. 2. Go to "Step 0390–023" on page 1-27 to verify fix. 3. If you **did not** find a problem with the supervisor card, continue at Priority 6.
6	I/O Planar Board	1. Replace board if needed. 2. Go to "Step 0390–023" on page 1-27 to verify fix. 3. If you **did not** find a problem, continue at Priority 7.
7	All Replaced	Call next level of support.

Step 0390–023: You have repaired or replaced a component.

1. Remove processor node from service position.

2. Reconnect all cables at rear of the processor node.

3. From the control workstation, power on this processor node.

4. From the control workstation, make sure the LCDs for this processor node are displayed on the screen.

5. Check the LCDs for the IPL sequence.

6. Do the LCDs indicate the IPL sequence?

   - If yes, go to "Step 0390–024" on page 1-28.

   - If no:

     a. Return to "Step 0390–022" on page 1-26.

     b. Continue service at the next priority level.

POWER3 SMP High Node control (MAP 0390)

Step 0390–024:   You repaired or replaced a component and the LCDs now show an IPL sequence.

1. From the TTY session, enter the command **diag**.

2. Select the "Advanced Diagnostic Routines".

3. Select "System Verification".

4. Select the "All Resources" option.

5. Does the processor node pass all diagnostic tests?

   - If yes:

     a. You have resolved the problem.

     b. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

   - If no:

     a. Repair the problem indicated by the diagnostics.

        – Use the information in Processor node diagnostics and descriptions (MAP 0130) in *RS/6000 SP: System Service Guide* if necessary.

Step 0390–025:   You have observed that the yellow or green LED on the node supervisor is not functioning and Table 1-4 on page 1-19 directed you to this procedure.

1. Have the customer remove the processor node from the active system configuration and power off the processor node.

2. Put the circuit breakers on the processor node into the Off ('0') position.

3. Perform the "Node Supervisor Self-Test."

   - Refer to "Node supervisor self-test" on page 3-11 for more information.

4. Check yellow and green LEDs on the node supervisor card to see if each LED lights at some point.

5. Does each of the eight LEDs light at any time?

   - If yes, go to "Step 0390–029" on page 1-29.

   - If **some** of the LEDs light, go to "Step 0390–026."

   - If **none** of the LEDs light, go to "Step 0390–028" on page 1-29.

Step 0390–026:   Some of the LEDs on the node supervisor failed to light during the supervisor self-test.

1. Place processor node in service position.

2. Repeat the "Node Supervisor Self-Test."

   - Refer to "Node supervisor self-test" on page 3-11 for more information.

3. Check to see if same color LED is always Off at the front of the node and on the node supervisor card.

4. Are LEDs of the same color always Off on both displays?

   - If yes, go to "Step 0390–028" on page 1-29.

   - If no, go to "Step 0390–027" on page 1-29.

Step 0390–027: When you compared LEDs at the front of the node to those on the node supervisor card, LEDs of different colors were Off.

1. Replace LED display card.

2. Repeat the "Node Supervisor Self-Test."

   • Refer to "Node supervisor self-test" on page 3-11 for more information.

3. Do LEDs of the same color on both displays light at any time?

   • If yes:

      a. You have resolved the problem.

      b. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide.*

   • If no, go to "Step 0390–028."

Step 0390–028: You are here for one of two reasons. Either:

• **All** of the LEDs on the node supervisor card do not light.

• LEDs of the **same** color on both the front of the node and on the node supervisor card do not light at any time.

This indicates that the node supervisor card may be at fault.

1. Replace the node supervisor card.

2. Perform "Node Supervisor Self-Test" to verify replacement.

   • Refer to "Node supervisor self-test" on page 3-11 for more information.

3. Does the "Node Supervisor Self-Test" pass?

   • If yes, go to "Step 0390–029."

   • If no, go to "POWER3 SMP High Node power (MAP 0380)" on page 1-7.

Step 0390–029: All LEDs on the front of the node and on the node supervisor card are operating.

1. Remove the processor node from the service position.

2. Reconnect all cables at the rear of the processor node.

3. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide.*

POWER3 SMP High Node minimum configuration (MAP 0400)

Purpose of this MAP:

This MAP is used to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimum-configured system. If a failure is detected on the minimum-configured system, the remaining FRU's are exchanged one at a time until the failing one is identified. If a failure is not detected, FRU's are added back until the failure occurs. The failure is then isolated to the failing FRU.

Attention: If another Error Code or Checkpoint displays while performing an isolation task, use the new indicator as the probable cause of the problem.

Attention: When you disconnect a SCSI cable from the DASD, it is possible that some of the data required to IPL the node will be unavailable. This can happen if a required filesystem is fully or partially on the disconnected DASD. In this case, the node will only boot to a code in the range **E1F7**, consider this a successful IPL for purposes of this MAP only.

POWER3 SMP High Node minimum configuration (MAP 0400)

Attention: If the boot DASD is installed and the diagnostics cannot find the boot source, troubleshoot the boot DASD problem first.

Attention: During these minimum configuration diagnostic procedures, you may use memory and CPU cards that you remove from POWER3 SMP High Nodes for problem isolation.

Step 0400–001: Before you place the POWER3 SMP High Node into its minimum configuration, you must determine if the problem is in the processor unit or in one of the SP Expansion I/O Units attached to the processor node. To make this determination:

1. Shutdown the node and power off from the control workstation.

2. Ensure all SP Expansion I/O Units attached to the processor node are shutdown and powered off from the control workstation.

    - **Note:** There may be more than one SP Expansion I/O Unit.

3. Set the POWER3 SMP High Node's circuit breaker to OFF ("0") position

4. Set the node's inline 48 V cable circuit breakers to OFF ("0") position

5. Record and remove all SP Expansion I/O Unit cables from the rear of the POWER3 SMP High Node at connectors Q1 through Q7

6. Set the node's inline 48 V cable circuit breakers to ON ("1") position

7. Set the POWER3 SMP High Node's circuit breaker to ON ("1") position

8. IPL the POWER3 SMP High Node

9. Does the node IPL properly?

    - If yes, The problem is in an SP Expansion I/O Unit. Go to "Step 0400–012" on page 1-35 to determine SP Expansion I/O Unit configuration.

    - If no, The node has problem and you will need to test the minimum node configuration. Go to "Step 0400–002"

Step 0400–002: You have determined that the POWER3 SMP High Node has a problem. Return the node to its minimum configuration to isolate the problem.

1. Check the POWER3 SMP High Node firmware levels of the I/O planar (IPLROS and SP code) to ensure they are at the correct levels

    a. Refer to "Installing firmware updates on SP nodes" on page 3-17.

2. Set the POWER3 SMP High Node's circuit breaker to OFF ("0") position.

3. Set the node's inline 48 V cable circuit breakers to OFF ("0") position.

4. Record the slot numbers of PCI adapters.

5. Label and record the location of any cable attached internally or externally to the adapters.

6. Remove all PCI adapters.

7. Remove all SP Expansion I/O Unit interposer cards from the I/O planar slots JR1 through JR7.

8. Remove the SPS MX2 adapter, if present, from POWER3 SMP High Node I/O planar slot J4.

9. Leave **one** CPU planar installed in slot CPU1, remove all other CPU planars.

10. Leave **one** memory card installed in slot MEM1, remove all other memory cards.

11. The remaining memory card should **only** have 8 DIMMs located on connectors:

    - J11A

- J21A

- J31A

- J41A

- J51A

- J61A

- J71A

- J81A

12. Remove all DASD except for the boot DASD (hdisk0).

Check DASD signal cable and DASD power cable at this time

Attention: When you disconnect a SCSI cable from the DASD, it is possible that some of the data required to IPL the node will be unavailable. This can happen if a required filesystem is fully or partially on the disconnected DASD. In this case, the node will only boot to a code in the range **E1F7**, consider this a successful IPL for purposes of this MAP only.

Although boot disk is typically set to *hdisk0* (which is typically the disk located in the lower CPU chassis DASD tray) it is possible that some other disk is defined as the boot disk. You can check the boot disk for this node using `splstdata -b` (then look at address jumpers on the disks). If possible, keep this boot disk in the configuration, even if it means physically moving the boot disk from the I/O expansion chassis to the CPU chassis.

Note: DASD logical volume problems can be alleviated by performing a netboot.

13. Go to "Step 0400–003."

Step 0400–003: Once the components have been removed, check the following cards and cables:

1. Reseat the node supervisor riser card and the node supervisor card

2. Check and secure cable to POWER3 SMP High Node system planar power connector J22

   - Refer to Figure 2-6 on page 2-9 in the POWER3 SMP High Node locations section of this book.

3. Check and secure cables to system planar power control connectors J23 and J24

4. Check and secure two cables to connectors J12, J14 on POWER3 SMP High Node I/O planar for POWER3 SMP High Node I/O bulkhead card

5. Check and secure power cable to POWER3 SMP High Node Node I/O Planar P1 and to docking card connector D3

6. Check and secure power control cable to Node I/O Planar P2 and to docking card connector J7

7. Check and secure SCSI cable to Node I/O Planar connector J15 and to docking card connector J2

8. Check and secure all cables connected to the Node I/O Planar docking card (SCSI, power control and power)

9. Go to "Step 0400–004"

Step 0400–004: Once all the components have been removed and the remaining components have been rechecked, you can begin checking the node to determine which FRU has failed. To resume testing the node:

1. Set the node's inline 48 V cable circuit breakers to ON ("1") position

2. Set the POWER3 SMP High Node circuit breaker to ON ("1") position

3. IPL the node

POWER3 SMP High Node minimum configuration (MAP 0400)

    4. Does the node IPL properly?

- If yes, go to "Step 0400–008" on page 1-33.

- If no:

      a. One of the node components has failed.

      b. Go to "Step 0400–005."

Step 0400–005: You have placed the node into minimum configuration and the node failed to IPL properly. If you deconfigured the minimum required memory or CPU, it would result in the node failing to boot. Therefore, you must check that the minimum configuration you set up meets the memory and CPU requirements.

1. Open a TTY window and access the Service Processor Menus.

2. From the Service Processor menu:

    a. Select the System Information Menu

    b. Read SP Error Log

3. Is there an error recorded in the log?

- If yes, you must determine:

    – If this is the first time you have seen this error code, go to Appendix A, "Messages and codes" on page A-1 and take appropriate action.

    – If this is the same error code that brought to this step, go to "Step 0400–006."

- If no, go to "Step 0400–006."

Step 0400–006: You did not find any errors in the error log. Therefore you must verify that both the memory and the CPUs are configured.

1. Open the Processor Configuration/Deconfiguration Menu.

2. Verify that the CPUs are configured.

- Configure the CPUs if necessary.

3. Open the Memory Configuration/Deconfiguration Menu/

4. Verify Memory is configured.

- Configure the memory if necessary.

5. Once you have verified that the CPU and Memory are both configured and active IPL the node.

6. Does node IPL properly?

- If yes, go to "Step 0400–008" on page 1-33.

- If no, go to "Step 0400–007."

Step 0400–007: To determine which node component has failed you will have to exchange the following components, one at a time, in the order listed. After **each** component is exchanged, you must IPL the node.

Attention: When possible, utilize removed parts as exchange units for problem determination.

1. All eight memory DIMMs

    DIMM Configuration

DIMMS **must** be installed in one of four groups. Each group **must** contain eight DIMMs. The four DIMM groups are: Group 1A, Group 2A, Group 1B, and Group 2B. If you are going to install more than one group of DIMMs, they should be installed in this order:

Table 1-8. POWER3 SMP High Node memory configuration

Installation Priority	DIMM Group Identifier	DIMM Connectors
1	Group 1A	J11A, J21A, J31A, J41A, J51A, J61A, J71A, J81A
2	Group 2A	J12A, J22A, J32A, J42A, J52A, J62A, J72A, J82A
3	Group 1B	J11B, J21B, J31B, J41B, J51B, J61B, J71B, J81B
4	Group 2B	J12B, J22B, J32B, J42B, J52B, J62B, J72B, J82B

2. Memory card

3. CPU card

4. Node I/O Planar

5. Node I/O Planar docking card

6. System planar

7. Fan control card

8. Power cards

9. Power planar

10. Boot DASD

11. DASD cable (2-drop)

12. Node I/O Planar power control flat ribbon cable

13. Node I/O Planar power cable

14. Node I/O Planar bulkhead flat ribbon cables (2)

15. System planar power control flat ribbon cable

16. System planar power cable

Does the node IPL properly?

- If yes:

    1. The last component you replaced was defective.

    2. Go to "Step 0400–008."

- If no:

    1. Replace next component on the list in "Step 0400–007" on page 1-32.

    2. If all components have been replaced, call your next level of support.

Step 0400–008: At this point, you are able to IPL the processor node and you need to determine if any other components need to be replaced.

1. One group at a time, reinstall the components you removed in "Step 0400–002" on page 1-30, including:

    - All DASD units

    - Repopulate the memory card in slot MEM1 with any DIMMs that you may have removed

- Reinstall any memory cards you removed from memory slot 2, 3, or 4
- Reinstall all CPU cards you removed from CPU slot 2, 3, or 4
- Reinstall the SPS MX2 adapter in I/O planar slot J4
- Reinstall any SP Expansion I/O Unit interposer cards removed from I/O planar slots JR1 through JR7
- Reinstall all PCI adapter cards using the slot numbers you recorded
- Reattach all SP Expansion I/O Unit loop cables

2. After **each** group is reinstalled, IPL the node.

3. Does the node IPL properly?

   - If yes, go to "Step 0400–011."
   - If no:

      a. The component you just reinstalled has failed.

      b. Go to "Step 0400–009."

Step 0400–009: After you reinstalled a component group, the node IPL failed. Therefore, a member of the last component group you reinstalled is defective.

1. Remove the entire component group.

2. One at a time, reinstall individual components of the group.

3. IPL the node to identify the failing component.

4. Replace the failed component.

5. IPL the node.

6. Does the node IPL properly?

   - If yes, go to "Step 0400–011."
   - If no, go to "Step 0400–010."

Step 0400–010: The node failed to IPL after you replaced **all** of the individual components of a component group.

1. Replace the planar.

2. IPL the node.

3. Does the node IPL properly?

   - If yes, go to "Step 0400–011."
   - If no, contact your next level of support.

Step 0400–011: After you found and replaced a defective component you were able to IPL the node. The remaining components that were removed for minimum configuration need to be tested.

1. Return to "Step 0400–008" on page 1-33 and reinstall another component from the list.

2. If all components have been reinstalled, go to End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

Step 0400–012:   You arrived at this step from either "Step 0400–001" on page 1-30 or "Step 0400–027" on page 1-41 or because an error code action directed you here.

- If you arrived here from "Step 0400–001" on page 1-30, you determined that there was a problem with an SP Expansion I/O Unit loop. If there is more than one SP Expansion I/O Unit loop, you must determine which loop is causing the problem.

- If you arrived here from "Step 0400–027" on page 1-41, you need to reinstall and test any additional SP Expansion I/O Unit loops.

- If an error code specified a location code or a diagnostic procedure has isolated the suspect SP Expansion I/O Unit loop and sent you to this step, continue problem determination with "Step 0400–013."

1. Select the first untested loop

2. If you came here from:

    - "Step 0400–001" on page 1-30, ensure the SP Expansion I/O Unit is powered Off and reconnect the unit's loop cables to the POWER3 SMP High Node

    - "Step 0400–027" on page 1-41, power Off the POWER3 SMP High Node and all attached SP Expansion I/O Units.

3. Set the inline 48 V cable circuit breakers on the SP Expansion I/O Unit loop to ON ("1") position

4. Set the SP Expansion I/O Unit circuit breaker to the "ON" position

5. Set the POWER3 SMP High Node inline 48 V cable circuit breakers to ON ("1") position

6. Set the POWER3 SMP High Node circuit breaker to the "ON" position and follow proper power-on procedures from control workstation

7. IPL the node

8. Does the node IPL properly?

    - If yes, this loop's SP Expansion I/O Units are not causing the problem

        a. Shutdown and power off the POWER3 SMP High Node

        b. Shutdown and power off the SP Expansion I/O Unit

        c. Begin "Step 0400–012" again with another SP Expansion I/O Unit loop

        d. If **all** SP Expansion I/O Unit loops for this node have been connected and the node IPLs successfully:

            1) Make certain that all elements of the node's configuration are displayed and functionally operating.

                – Refer to "Verifying the POWER3 SMP High Node configuration" on page 3-19.

            2) Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

    - If the node **does not** IPL properly, go to "Step 0400–013."

Step 0400–013:   The POWER3 SMP High Node does not IPL with SP Expansion I/O Unit loops attached and you need to perform the loop isolation procedure.

1. Power On the SP Expansion I/O Unit.

2. Power On the POWER3 SMP High Node.

3. Are the power indicators on all SP Expansion I/O Units normal (green LED = on and yellow LED = off)?

    - If yes, go to "Step 0400–014" on page 1-36.

POWER3 SMP High Node minimum configuration (MAP 0400)

- If no, go to "SP Expansion I/O Unit power (MAP 0420)" on page 1-49.

Step 0400–014: The POWER3 SMP High Node did not IPL but when you powered it On but all SP Expansion I/O Unit power indicators were normal.

1. Did the node IPL when you powered it On with the loop attached?

   - If yes, go to "Step 0400–027" on page 1-41.

   - If no, go to "Step 0400–015."

Step 0400–015: All power indicators are okay but the node **did not** IPL with the loop attached.

1. Make certain that the SP Expansion I/O Unit loop cables are plugged into the node.

2. Are the loop cables properly connected?

   - If yes, go to "Step 0400–016."

   - If no:

      a. Correct all cable problems.

      b. Go to "Step 0400–027" on page 1-41.

Step 0400–016: All power indicators are okay **and** the SP Expansion I/O Unit loop cables are correctly plugged into the node. However, the node **does not** IPL with the loop attached.

1. How many SP Expansion I/O Units are attached to the loop?

   - If the loop has **one** SP Expansion I/O Unit, go to "Step 0400–020" on page 1-38.

   - If the loop has **two** SP Expansion I/O Units, go to "Step 0400–017."

Step 0400–017: A POWER3 SMP High Node will not IPL when attached to an SP Expansion I/O Unit loop with two units attached. This indicates that one of the SP Expansion I/O Units is failing. Determine which unit is failing by eliminating one SP Expansion I/O Unit from the loop.

1. Power Off the POWER3 SMP High Node and both SP Expansion I/O Units.

2. Remove the jumper cable attaching the SP Expansion I/O Units to each other.

3. **At** SP Expansion I/O Unit one, disconnect the cable attaching unit one to the processor node.

4. Form a new loop with only one SP Expansion I/O Unit attached by taking the end of the cable that was going to SP Expansion I/O Unit one and plugging it into the port that had been occupied by the jumper cable on SP Expansion I/O Unit two.

5. Power On SP Expansion I/O Unit two.

6. Power On the POWER3 SMP High Node.

7. Does the node IPL?

   - If yes:

      a. Perform the "Verify Node Configuration Procedure" to make sure all cables, interposer cards and resources on this loop are seen by the node.

      b. If all components are recognized, SP Expansion I/O Unit one may be failing.

      c. Go to "Step 0400–018" on page 1-37.

   - If the node **does not** IPL, go to "Step 0400–019" on page 1-37.

Step 0400–018: SP Expansion I/O Unit two, the interposer cards in the processor node, and both cables attached to the processor node appear to be okay. You must now test SP Expansion I/O Unit one by making a new single unit loop.

1. Power Off the POWER3 SMP High Node and both SP Expansion I/O Units.

2. Remove both cables attaching unit two to the processor node.

3. Form a new single unit loop with SP Expansion I/O Unit one by attaching both cables to SP Expansion I/O Unit one.

4. Power On SP Expansion I/O Unit one.

5. Power On the POWER3 SMP High Node.

6. Does the node IPL?

   - If yes:

     a. Perform the "Verify Node Configuration Procedure" to make sure all cables, interposer cards and resources on this loop are seen by the node.

     b. If all components are recognized, the jumper cable connecting the two SP Expansion I/O Units may be defective.

     c. Replace the jumper cable.

     d. Go to "Step 0400–027" on page 1-41.

   - If no:

     a. SP Expansion I/O Unit one may be failing.

     b. Go to "Step 0400–028" on page 1-41.

Step 0400–019: You created a single unit loop with SP Expansion I/O Unit two and the processor node **would not** IPL. You need to determine if the problem is in the SP Expansion I/O Unit, the node interposer cards, or in the cables.

1. Power Off the POWER3 SMP High Node and both SP Expansion I/O Units.

2. Remove both cables attaching unit two to the processor node.

3. Form a new single unit loop with SP Expansion I/O Unit one by attaching both cables to SP Expansion I/O Unit one.

4. Power On SP Expansion I/O Unit one.

5. Power On the POWER3 SMP High Node.

6. Does the processor node IPL when the loop is routed through unit one?

   - If yes:

     a. Perform the "Verify Node Configuration Procedure" to make sure all cables, interposer cards and resources on this loop are seen by the node.

     b. If all components are recognized when the loop is routed through unit one, then SP Expansion I/O Unit two may be defective.

     c. Remove both cables from unit one and reattach unit two to the processor node.

     d. Go to "Step 0400–028" on page 1-41.

   - If no:

     a. The problem is likely to be in the node interposer cards or in the cables.

     b. Go to "Step 0400–020" on page 1-38.

POWER3 SMP High Node minimum configuration (MAP 0400)

Step 0400–020:   You are unable to IPL a POWER3 SMP High Node that has a single SP Expansion I/O Unit in an attached loop.

1. Power Off the POWER3 SMP High Node and the attached SP Expansion I/O Unit.

2. Remove **both** ends of the cable attaching the SP Expansion I/O Unit to the processor node's **odd** numbered interposer card.

3. Power On the disconnected SP Expansion I/O Unit.

4. Power On the POWER3 SMP High Node.

5. Does the node IPL when the cable to the processor node's odd numbered interposer card is removed?

   - If yes:

        a. One or more of the following **unattached** components may be defective:

            – The SP Expansion I/O Unit interposer card

            – The disconnected cable

            – The processor node's **odd** numbered interposer card

        b. Go to "Step 0400–021."

   - If the node **does not** IPL:

        a. One or more of the following **attached** components may be defective:

            – The **cable** connected to the processor node's **even** numbered interposer card

            – The SP Expansion I/O Unit

            – The processor node's **even** numbered interposer card

        b. Go to "Step 0400–024" on page 1-40.

Step 0400–021:   When you broke the loop on a POWER3 SMP High Node attached to a single SP Expansion I/O Unit, you were able to IPL the node. You must now determine which of the following components are defective:

- The SP Expansion I/O Unit interposer card

- The disconnected cable

- The processor node's **odd** numbered interposer card

Begin by checking the SP Expansion I/O Unit interposer card.

1. Power Off the POWER3 SMP High Node and the partially attached SP Expansion I/O Unit.

2. **At** the SP Expansion I/O Unit, move the single cable attached to the unit from its current interposer card to the unoccupied interposer card on the unit.

3. Power On the partially connected SP Expansion I/O Unit.

4. Power On the POWER3 SMP High Node.

5. Does the processor node IPL?

   - If yes:

        a. The SP Expansion I/O Unit interposer card is okay.

        b. Go to "Step 0400–022" on page 1-39 and test the next component.

   - If no:

a. The SP Expansion I/O Unit interposer card is defective.

b. Replace the SP Expansion I/O Unit interposer card.

c. Go to "Step 0400–027" on page 1-41.

Step 0400–022:   You determined that the SP Expansion I/O Unit interposer card **was not** causing IPL failure on the processor node. This procedure will determine if the problem is in the segment of cable that you totally disconnected from the SP Expansion I/O Unit.

1. Power Off the POWER3 SMP High Node and the partially attached SP Expansion I/O Unit.

2. Completely **remove** the single cable attaching the SP Expansion I/O Unit to the processor node's **even** numbered interposer card.

3. Using the same ports, **install** the cable that had been previously removed from the processor node's **odd** numbered interposer card.

4. Power On the partially connected SP Expansion I/O Unit.

5. Power On the POWER3 SMP High Node.

6. Does the processor node IPL?

   - If yes:

      a. The cable segment is okay.

      b. Go to "Step 0400–023" and test the next component.

   - If no:

      a. The cable is defective.

      b. Replace the cable segment.

      c. Go to "Step 0400–027" on page 1-41.

Step 0400–023:   You determined that the cable **was not** causing IPL failure on the processor node. This procedure will determine if the problem is in the processor node's **odd** numbered interposer card.

1. Power Off the POWER3 SMP High Node and the partially attached SP Expansion I/O Unit.

2. **At** the processor node's **even** numbered interposer card, remove the cable attaching the SP Expansion I/O Unit to the processor node.

3. **Reattach** the cable to the processor node's **odd** numbered interposer card.

4. Power On the partially connected SP Expansion I/O Unit.

5. Power On the POWER3 SMP High Node.

6. Does the processor node IPL?

   - If yes:

      a. The processor node's interposer cards are okay.

      b. The SP Expansion I/O Unit needs to be placed in minimum configuration.

      c. Go to "Step 0400–028" on page 1-41.

   - If no:

      a. The node interposer card is defective.

      b. Replace the interposer card.

      c. Go to "Step 0400–027" on page 1-41.

POWER3 SMP High Node minimum configuration (MAP 0400)

Step 0400–024:   You broke the loop on a POWER3 SMP High Node attached to a single SP Expansion I/O Unit but you **could not** IPL the node. You must now determine which of the following components are defective:

- The cable connected to the processor node's **even** numbered interposer card
- The interposer card in the SP Expansion I/O Unit
- The processor node's **even** numbered interposer card
- The SP Expansion I/O Unit

Begin by checking the **cable** connected to the processor node's **even** numbered interposer card.

1. Power Off the POWER3 SMP High Node and the partially attached SP Expansion I/O Unit.
2. Completely **remove** the cable attaching the SP Expansion I/O Unit to the processor node's **even** numbered interposer card.
3. Using the same ports, **install** the cable that had been previously removed from the processor node's **odd** numbered interposer card.
4. Power On the partially connected SP Expansion I/O Unit.
5. Power On the POWER3 SMP High Node.
6. Does the processor node IPL?

   - If yes:

     a. The cable you just removed is defective.

     b. Install a new cable and return the loop to its original configuration.

     c. Go to "Step 0400–027" on page 1-41.

   - If no, go to "Step 0400–025" and test the next component.

Step 0400–025:   You determined that the **cable** connected to the processor node's **even** numbered interposer card **was not** causing IPL failure on the processor node. This procedure will determine if the problem is in the currently unused SP Expansion I/O Unit interposer card.

1. Power Off the POWER3 SMP High Node and the partially attached SP Expansion I/O Unit.
2. **Disconnect** the cable from the currently used SP Expansion I/O Unit interposer card.
3. **Reconnect** the cable to the unit's other interposer card.
4. Power On the partially connected SP Expansion I/O Unit.
5. Power On the POWER3 SMP High Node.
6. Does the processor node IPL?

   - If yes:

     a. The original SP Expansion I/O Unit interposer card is defective.

     b. Replace the interposer card.

     c. Go to "Step 0400–027" on page 1-41.

   - If no, go to "Step 0400–026" on page 1-41 and test the next component.

Step 0400–026:   You determined that the SP Expansion I/O Unit interposer card **was not** causing IPL failure on the processor node. This procedure will determine if the problem is in the processor node's **even** numbered interposer card.

1. Power Off the POWER3 SMP High Node and the partially attached SP Expansion I/O Unit.

2. **Replace** the processor node's **even** numbered interposer card.

3. Power On the partially connected SP Expansion I/O Unit.

4. Power On the POWER3 SMP High Node.

5. Does the processor node IPL?

   - If yes:

     a. The interposer card you just removed was defective.

     b. Go to "Step 0400–027."

   - If no:

     a. The SP Expansion I/O Unit may be defective.

     b. Go to "Step 0400–028" and place the unit in minimum configuration.

Step 0400–027:   The processor node is now able to IPL with the SP Expansion I/O Unit attached.

1. Power Off the POWER3 SMP High Node and the attached SP Expansion I/O Unit.

2. Properly reconnect all cables from the POWER3 SMP High Node to the SP Expansion I/O Units.

3. Properly reconnect the jumper cable between the SP Expansion I/O Units.

4. Assure that a Qodd-Qeven pair (Q1-Q2, Q3-Q4, Q5-Q6) is used.

5. Power On **all** SP Expansion I/O Units attached to the processor node.

6. Power On the POWER3 SMP High Node.

7. Perform the "Verify Node Configuration Procedure" to make sure all cables, interposer cards and resources on this loop are seen by the node.

8. Is this the last SP Expansion I/O Unit loop attached to the processor node?

   - If yes, go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

   - If no, return to "Step 0400–012" on page 1-35 and continue service procedures.

Step 0400–028:   You have isolated a problem to a **specific** SP Expansion I/O Unit. To test the SP Expansion I/O Unit, you must place the unit into its minimum configuration.

1. Shutdown and power off the POWER3 SMP High Node from the control workstation

2. Shutdown and power off the SP Expansion I/O Unit from the control workstation

3. Set the circuit breaker on the failing SP Expansion I/O Unit to OFF ("0") position

4. Set the node's inline 48 V cable circuit breakers to OFF ("0") position

5. Record the slot numbers of the PCI adapters

6. Label and record the location of all cables attached internally and externally to the adapters

7. Remove all PCI adapters

8. Remove all DASDs

POWER3 SMP High Node minimum configuration (MAP 0400)

9. Make sure that the cable connectors are secure with proper stand-off at the Node I/O Planar and at the SP Expansion I/O Unit

10. Reseat the SP Expansion I/O Unit node supervisor by unplugging, then plugging, the supervisor card

11. Set the SP Expansion I/O Unit inline 48 V cable circuit breakers to ON ("1") position

12. Set the SP Expansion I/O Unit circuit breaker to the "ON" position

13. Set the POWER3 SMP High Node inline 48 V cable circuit breakers to ON position

14. Set the POWER3 SMP High Node circuit breaker to the "ON" position and follow proper power-on procedures from control workstation

15. IPL the node

16. Does the node IPL properly?

- If yes:

    a. The problem is in SP Expansion I/O Unit components you removed.

    b. Go to "Step 0400–029" to determine which component has failed.

- If no:

    a. There is a problem in the SP Expansion I/O Unit minimum configuration.

    b. Go to "Step 0400–033" on page 1-43.

Step 0400–029:   You have determined that the problem is in one of the components you removed from the SP Expansion I/O Unit. You must now determine which components have failed. To do so:

1. One group at a time, reinstall the components you removed in "Step 0400–028" on page 1-41 including:

- Left side PCI adapters

- Right side PCI adapters

- All DASD units

2. After **each** component group is reinstalled, IPL the node.

3. Does the node IPL properly?

- If yes, go to "Step 0400–032" on page 1-43.

- If no:

    a. The component group you just reinstalled has failed.

    b. Go to "Step 0400–030."

Step 0400–030:   After you reinstalled a component group, the node IPL failed. Therefore, a member of the last component group you reinstalled is defective.

1. Remove the entire component group.

2. One at a time, reinstall individual components of the group.

3. IPL the node to identify the failing component.

4. Replace the failed component.

5. IPL the node.

6. Does the node IPL properly?

- If yes, go to "Step 0400–032" on page 1-43.

- If no, go to "Step 0400–031" on page 1-43.

Step 0400–031:   The node failed to IPL after you replaced **all** of the individual components of a component group.

1. Replace the expansion I/O planar.

2. IPL the node.

3. Does the node IPL properly?

    - If yes, go to "Step 0400–032."

    - If no, contact your next level of support.

Step 0400–032:   After you found and replaced a defective component you were able to IPL the node. The remaining components that were removed for minimum configuration need to be tested.

1. Return to "Step 0400–029" on page 1-42 and reinstall another component.

2. If all components have been reinstalled:

    a. Make certain **all** SP Expansion I/O Unit loop cables have been reconnected.

    b. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

Step 0400–033:   Test the minimum configuration of the SP Expansion I/O Unit that failed to IPL. To determine which component failed replace the following components, one at a time, in the order listed. After **each** component is replaced, you must IPL the node.

1. I/O planar

2. Power supply 1

3. Power supply 2

4. Supervisor card

5. DASD controller

6. DASD docking card

7. SCSI cable or SSA cable

8. CB and Power cable assembly

9. SP Expansion I/O Unit interposer cards

10. LED card and cable

Does the node IPL properly?

- If yes:

    1. The last component you replaced was defective.

    2. Go to "Step 0400–029" on page 1-42

- If no:

    1. Replace next component on the list in "Step 0400–033."

    2. If all components have been replaced, call your next level of support.

SP Expansion I/O Unit MAPs

SP Expansion I/O Unit environment (MAP 0410)

Note: Refer to "Service position procedures" on page 3-15 for placing processor nodes into the service position or for removing them from the service position.

Refer to Table 1-9 for a description of the SP Expansion I/O Unit LED indications.

Table 1-9. SP Expansion I/O Unit Supervisor LEDs		
Green LED	**Yellow LED**	**Indicates:**
On	Off	Normal operation
On	On	Power or environmental problem
Off	Flashing	Failure caused by power or environmental problem
Off	Off	Circuit breaker off or 48V input problem

Step 0410–001: You have detected an environmental problem that is affecting a SP Expansion I/O Unit and the information in Processor node diagnostics and descriptions (MAP 0130) in *RS/6000 SP: System Service Guide* directed you to this procedure.

1. Did you use a system message or an observed condition during your initial diagnosis of the environmental problem?

   - If you used a message displayed by the system for your initial diagnosis, go to "Step 0410–002."

   - If you observed a system condition (such as a yellow SP Expansion I/O Unit supervisor LED) that led to your initial diagnosis, go to "Step 0410–005" on page 1-45.

Step 0410–002: A TTY message indicated "rc.powerfail" or when you issued the command **errpt -a | pg** the display indicated "Loss of Electric Power" associated with the SP Expansion I/O Unit.

1. Check the failing node's error log by issuing **errpt -a | pg** on the affected node's AIX window to check for "Loss of Power" or warning messages.

2. Does the message indicate a loss of power or that the power is off?

   - If yes, go to "Step 0410–004" on page 1-45.

   - If the message **does not** indicate that the power is off or that you have a power loss:

     a. If the message is a warning, go to "Step 0410–003."

     b. If the message **is not** a warning, go to "Step 0410–005" on page 1-45.

Step 0410–003: The message you received was a warning.

1. Does the same message occur on more than one unit?

   - If yes, notify the next level of support.

   - If the same message **does not** occur on more than one unit, then no immediate service is required. At this point you can either:

     – Defer the service action until a later date.

     – Perform the service now by going to "Step 0410–004" on page 1-45 and treating the warning message as a "Shutdown" or "Failure" message.

Step 0410–004:   A serious environmental condition has been detected in the SP Expansion I/O Unit.

Note: If service action has just been completed on this SP Expansion I/O Unit, check for loose cables or shorted conditions in the SP Expansion I/O Unit.

Based on the text of the message, use Table 1-10 on page 1-45 to continue service.

Table 1-10. SP Expansion I/O Unit environmental conditions	
Condition	**Action**
Any power loss message	Go to "Step 0410–005."
"...cooling problem..." or fan problem	Go to "Step 0410–007."

Step 0410–005:   You have observed a condition that indicates that a power problem exists.

1. Check the SP Expansion I/O Unit supervisor yellow LED.

2. Is the SP Expansion I/O Unit supervisor yellow LED On or flashing?

    - If the yellow LED is On and it **is not** flashing, go to "Step 0410–006."

    - If the yellow LED is **flashing**, go to Main power (MAP 0450) in *RS/6000 SP: System Service Guide*.

    - If the yellow LED and green LED 1 are both **Off**, go to "POWER3 SMP High Node power (MAP 0380)" on page 1-7.

Step 0410–006:   Yellow LED 5 is On and it **is not** flashing.

1. Check for airflow blockage, fan problems or other cooling problems with the unit.

2. Do any of these problems exist?

    - If yes, go to "Step 0410–007."

    - If no:

        a. This indicates that you may have a power supply card problem.

        b. Go to "Step 0410–010" on page 1-47.

Step 0410–007:   You have detected a cooling or fan problem with a SP Expansion I/O Unit.

1. Run the advanced diagnostics problem determination routine to obtain failure data.

2. Place the unit into the service position.

3. Use Table 1-11 on page 1-46 to replace components.

SP Expansion I/O Unit environment (MAP 0410)

Table 1-11. SP Expansion I/O Unit service actions

Priority	Component	Action
1	Fan 1, 2 **Note:** See Figure 1-2 on page 1-47.	1. Check specified fan for blockage or loose cable connection. Refer to the error log utility on the service processor menu. 2. Fix any obvious problems. If none are found, continue at Priority 2. 3. Continue at "Step 0410–008" on page 1-46.
2	Fan 1, 2 **Note:** See Figure 1-2 on page 1-47.	1. Replace fan and/or cooling module as described in Chapter 4, FRU removals and replacements. Refer to: • "Removing a fan" on page 4-33 • "Replacing a fan" on page 4-34 • The error log utility on the service processor menu. 2. Fix any obvious problems. 3. Continue at "Step 0410–008" on page 1-46.
3	Supervisor Card	1. Replace card 2. Continue at "Step 0410–008" on page 1-46.
4	DASD Controller Card	1. Replace card 2. Continue at "Step 0410–008" on page 1-46.
5	DASD Docking Card	1. Replace card 2. Continue at "Step 0410–008" on page 1-46.
6	DASD power cable assembly	1. Replace assembly 2. Continue at "Step 0410–008" on page 1-46.
7	I/O Planar	1. Replace assembly 2. Continue at "Step 0410–008" on page 1-46.
8	All replaced	Call next level of support.

Step 0410–008: You have replaced a component.

1. Remove the unit from the service position.

2. Reconnect all cables at the rear of the processor node.

3. Put the circuit breakers on processor node into the On ('1') position.

4. Check the error log or SRN.

5. Does the problem still exist?

   • If yes, go to "Step 0410–009" on page 1-47.

   • If no:

      a. You have resolved the problem.

      b. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.
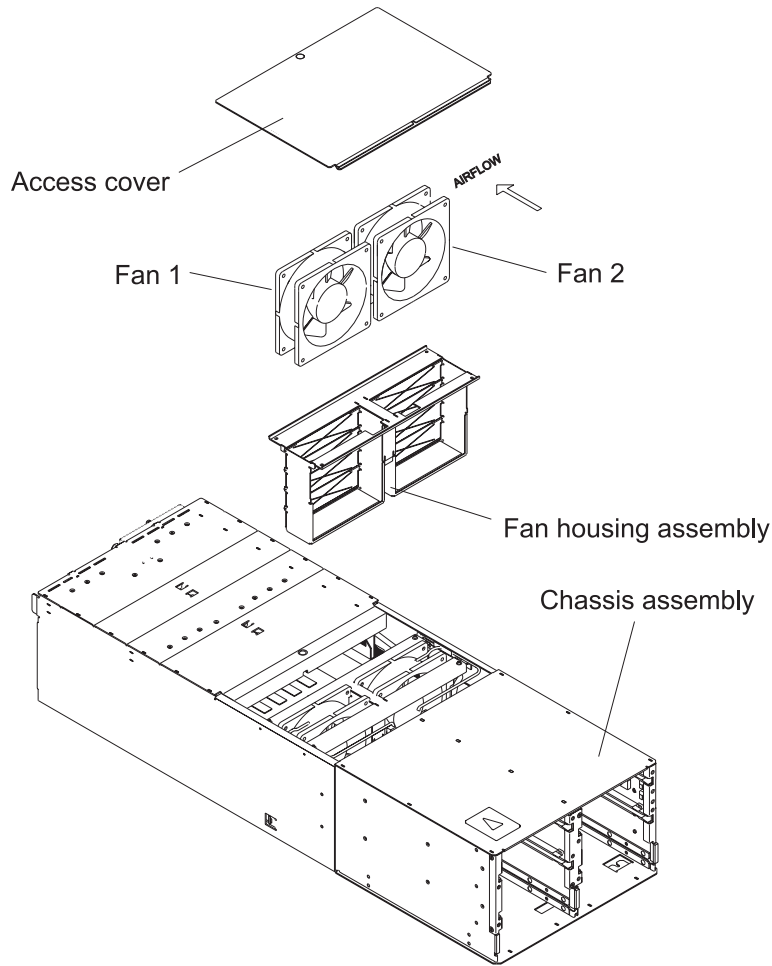
Figure 1-2. SP Expansion I/O Unit fan layout

Step 0410–009: You have replaced a component but the problem still exists.

1. Put SP Expansion I/O Unit's circuit breaker into the Off ('0') position.

2. Reinstall the previously removed component.

3. Return to "Step 0410–007" on page 1-45 to service the next highest priority component listed in Table 1-11.

Step 0410–010: The yellow LED on the SP Expansion I/O Unit supervisor is On and it **is not** flashing but you did not find any obvious cooling problems. This indicates that you may have a problem with a power supply card.

Note: If done one card at a time, SP Expansion I/O Unit power supply cards **are** "hot-plugable" (cards may be removed or inserted while the unit is powered On).

1. Make certain that each power supply card is properly seated.

2. Are all power supply cards properly seated?

   - If yes, go to "Step 0410–011" on page 1-48.

   - If no:

     a. Reseat the power supply cards.

     b. Return to "Step 0410–008" on page 1-46.

SP Expansion I/O Unit environment (MAP 0410)

Step 0410–011:   The yellow LED on the SP Expansion I/O Unit supervisor is On and it **is not** flashing. All power supply cards were properly seated and you did not find any obvious cooling problems.

1. Obtain failure data by running the advanced diagnostics problem determination routine.

2. Do the diagnostics **fail**?

    - If yes, go to "Step 0410–012" on page 1-48.

    - If no, return to "Step 0410–008" on page 1-46.

Step 0410–012:   **All** power supply cards were properly seated but the yellow LED is on and not flashing; this indicates that a power card has failed.

1. Replace the power supply card indicated by the advanced diagnostics routine.

    - Refer to "Removing a power supply" on page 4-36 and "Replacing a power supply" on page 4-36.

        Note: If done one card at a time, SP Expansion I/O Unit power supply cards **are** "hot-plugable" (cards may be removed or inserted while the unit is powered On).

2. Check to see that the yellow LED is Off.

3. Is the yellow LED Off?

    - If yes:

        a. You have resolved the problem.

        b. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

    - If no, "Step 0410–013."

Step 0410–013:   You replaced the power supply card suggested by the advanced diagnostics but the yellow LED is still lit. This indicates that the other power supply card has also failed.

1. Replace the second power supply card.

    - Refer to "Removing a power supply" on page 4-36 and "Replacing a power supply" on page 4-36.

        Note: If done one card at a time, SP Expansion I/O Unit power supply cards **are** "hot-plugable" (cards may be removed or inserted while the unit is powered On).

2. Check to see that the yellow LED is Off.

3. Is the yellow LED Off?

    - If yes:

        a. You have resolved the problem.

        b. Go to the End of call procedures (MAP 0650) in IBM RS/6000 SP: Administration Guide.

    - If no, "Step 0410–014."

Step 0410–014:   You replaced both power supply cards but the yellow LED is still lit.

1. Replace the SP Expansion I/O Unit supervisor card.

2. Remove the SP Expansion I/O Unit from the service position and power the unit On.

3. Check to see that the yellow LED is Off.

4. Is the yellow LED Off?

    - If yes:

        a. You have resolved the problem.

b. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

- If no, go to "Step 0410–015."

Step 0410–015: You replaced SP Expansion I/O Unit supervisor card but the yellow LED is still lit.

1. Replace the DASD docking card.

2. Remove the SP Expansion I/O Unit from the service position and power the unit On.

3. Check to see that the yellow LED is Off.

4. Is the yellow LED Off?

- If yes:

    a. You have resolved the problem.

    b. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

- If no, go to "Step 0410–016."

Step 0410–016: You replaced the DASD docking card but the yellow LED is still lit.

1. Replace the I/O planar.

2. Remove the SP Expansion I/O Unit from the service position and power the unit On.

3. Check to see that the yellow LED is Off.

4. Is the yellow LED Off?

- If yes:

    a. You have resolved the problem.

    b. Go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

- If no, call the next level of support.

SP Expansion I/O Unit power (MAP 0420)

Note: Refer to "Service position procedures" on page 3-15 for placing processor nodes into the service position or for removing them from the service position.

Note: For proper operation, all SP Expansion I/O Units attached to a given node must be powered up **before** power is applied to the node.

Refer to Table 1-12 for a description of the SP Expansion I/O Unit LED indications.

Table 1-12. SP Expansion I/O Unit Supervisor LEDs

Green LED	**Yellow LED**	**Indicates:**
On	Off	Normal operation
On	On	Power or environmental problem
Off	Flashing	Failure caused by power or environmental problem
Off	Off	Circuit breaker off or 48V input problem

SP Expansion I/O Unit power (MAP 0420)

Step 0420–001:   You have arrived at this point because the green power LED on the SP Expansion I/O Unit is not lit and the SP Expansion I/O Unit appears to be powered off.

1. Ensure all circuit breakers associated with the SP Expansion I/O Unit being serviced are in the On position.

   - This includes the circuit breaker on the back of the SP Expansion I/O Unit power assembly and the power cable's 48-volt inline breaker.

2. Any circuit breaker found in the Off position should be turned On.

3. Do any of the circuit breakers go (trip) to the Off position?

   - If yes, go to "Step 0420–005" on page 1-51.

   - If no, go to "Step 0420–002."

Step 0420–002:   When you placed a circuit breaker on the SP Expansion I/O Unit's power assembly or the 48-volt power cable's inline breaker into the On position it **did not** trip to the Off position.

1. Check the SP Expansion I/O Unit's (green) power LED on the front of the SP Expansion I/O Unit **or** on the SP Expansion I/O Unit's Supervisor card in the back of the SP Expansion I/O Unit.

2. Is the SP Expansion I/O Unit's power LED lit?

   - If yes, go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

   - If no, go to "Step 0420–003."

Step 0420–003:   All circuit breakers are on but the SP Expansion I/O Unit's (green) power LED is **not** lit.

1. Ensure that the supervisor cable is properly plugged into the SP Expansion I/O Unit.

2. Ensure that the supervisor harness is properly plugged into the SEPBU.

3. Reset the SP Expansion I/O Unit's supervisor by unplugging and replugging the SP Expansion I/O Unit supervisor cable at the SP Expansion I/O Unit end and observe the LED's on the supervisor card.

4. Do any of the LED's on the supervisor card light?

   - If yes, this indicates that 12-volt power is getting to the supervisor card.

     – If the (green) SP Expansion I/O Unit LED is still Off, go to "Step 0420–011" on page 1-52.

     – If the (green) SP Expansion I/O Unit LED is On, go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

   - If no, go to "Step 0420–004."

Step 0420–004:   You reset the SP Expansion I/O Unit's supervisor but the SP Expansion I/O Unit's (green) power LED is **not** lit.

1. Replace the SP Expansion I/O Unit's supervisor card.

2. Do any of the LED's on the supervisor card light?

   - If yes, this indicates that 12-volt power is getting to the supervisor card.

     – If the (green) SP Expansion I/O Unit LED is still Off, go to "Step 0420–011" on page 1-52.

     – If the (green) SP Expansion I/O Unit LED is On, go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

   - If no, go to Scalable Electrical Power Base Unit diagnostics (MAP 0540) in *RS/6000 SP: System Service Guide*.

Step 0420–005:   You have arrived at this point because one of the circuit breakers associated with the suspect SP Expansion I/O Unit has tripped and cannot be reset.

Attention:

The 48-volt power cable has an inline circuit breaker. Ensure that **both** the inline circuit breaker **and** the circuit breaker on the back of the SP Expansion I/O Unit are in the **Off** position before connecting or disconnecting the 48-volt power cable from the SP Expansion I/O Unit.

1. Confirm that the 48-volt power supply cable is connected at both ends.

2. Check the 48-volt bulk power harness at the back of the SP Expansion I/O Unit and the SEPBU and the 48-volt bulk power connections for any obvious problems which might cause a short.

3. Does everything appear to be okay?

   - If yes, go to "Step 0420–006."

   - If no:

      a. Fix any obvious problems.

      b. Return to "Step 0420–001" on page 1-50.

Step 0420–006:   A circuit breaker associated with the suspect SP Expansion I/O Unit cannot be reset and all power cables appear to be okay.

1. Disconnect the 48-volt power cable from the SP Expansion I/O Unit.

2. Using a multimeter, check for an electrical short between pins J1-1 and J1-3 on the SP Expansion I/O Unit back panel.

   - If this is the **first** time through this MAP and you **detected** an electrical short, go to "Step 0420–008" on page 1-52.

   - If this is the **first** time through this MAP and you **did not** detect an electrical short, go to "Step 0420–007."

   - If this is the **second** time through this MAP, **replace** the 48-volt power cable even if a shorted condition does not exist, then return to "Step 0420–001" on page 1-50.

Step 0420–007:   The first time you went through "Step 0420–006," you   **did not** detect an electrical short between the pins on the SP Expansion I/O Unit's back panel.

1. Disconnect the 48-volt power cable from the SEPBU back panel.

2. Place the inline circuit breaker in the On position.

3. Using a multimeter, check for an electrical short in the 48-volt power cable.

4. Was an electrical short detected?

   - If yes:

      – Replace the 48-volt power cable.

         Attention:

         The 48-volt power cable has an inline circuit breaker. Ensure that **both** the inline circuit breaker **and** the circuit breaker on the back of the SP Expansion I/O Unit are in the **Off** position before connecting or disconnecting the 48-volt power cable from the SP Expansion I/O Unit.

      – Return to "Step 0420–001" on page 1-50.

SP Expansion I/O Unit power (MAP 0420)

- If no, return to "Step 0420–001" on page 1-50.

Step 0420–008: The first time you went through "Step 0420–006" on page 1-51, you **detected** an electrical short between the pins on the SP Expansion I/O Unit's back panel.

1. Ensure the circuit breaker on the back of the SP Expansion I/O Unit is in the Off position.

2. Place the SP Expansion I/O Unit in the service position.

3. Perform the first **four** steps in "Removing the circuit breaker and power cable" on page 4-35.

4. Unplug P13 from the I/O planar but **do not** remove the circuit breaker.

5. Using a multimeter, check if the electrical short between pins J1-1 and J1-3 on the SP Expansion I/O Unit's back panel still exists.

6. Was an electrical short detected?

   - If yes, go to "Step 0420–010."
   - If no, go to "Step 0420–009."

Step 0420–009: The first time you went through "Step 0420–006" on page 1-51, you **did** detect an electrical short. However, after you unplugged P13 from the I/O planar, you were **not able** to detect the electrical short between pins J1-1 and J1-3.

1. Replace the I/O planar assembly in the SP Expansion I/O Unit.

   - Refer to"Removing the I/O planar" on page 4-45 and "Replacing the I/O planar" on page 4-46.

2. Reconnect all cables at the back of the SP Expansion I/O Unit and on the SEPBU.

3. Return to "Step 0420–001" on page 1-50.

Step 0420–010: The first time you went through "Step 0420–006" on page 1-51, you detected an electrical short and after you unplugged P13 from the I/O planar, the electrical short was still present.

1. Replace the SP Expansion I/O Unit circuit breaker and power cable assembly.

   - Refer to "Removing the circuit breaker and power cable" on page 4-35 and "Replacing the circuit breaker and power cable" on page 4-35.

2. Using a multimeter, confirm that the electrical short between the 48-volt input connector pins J1–1 and J1–3 on the SP Expansion I/O Unit back panel is gone.

3. Reconnect all cables at the back of the SP Expansion I/O Unit and on the SEPBU.

4. Return to "Step 0420–001" on page 1-50.

Step 0420–011: You have arrived at this point because **all** circuit breakers associated with the SP Expansion I/O Unit are in the On position and a visual examination of the SP Expansion I/O Unit's supervisor card (green) LED shows the (green) LED is Off. This indicates that the 48-volt power is not getting to the SP Expansion I/O Unit.

1. Make certain that the 48-volt power cable is properly plugged into both the SP Expansion I/O Unit and into the SEPBU.

   - If the 48-volt power cable **is not** properly plugged in, correct the problem and return to "Step 0420–001" on page 1-50.

   Attention:

The 48-volt power cable has an inline circuit breaker. Ensure that **both** the inline circuit breaker **and** the circuit breaker on the back of the SP Expansion I/O Unit are in the **Off** position before connecting or disconnecting the 48-volt power cable from the SP Expansion I/O Unit.

2. If the 48-volt power cable was connected properly, disconnect the cable at both ends.

3. Place the inline circuit breaker on the 48-volt power cable in the On position.

4. Using a multimeter, check the continuity of each wire.

5. Do all wires in the cable have continuity from end to end?

   - If yes, go to "Step 0420–013."

   - If no, go to "Step 0420–012."

Step 0420–012: The 48-volt power cable **does not** have continuity from end to end. This indicates that the cable is defective.

1. Replace the 48-volt power cable.

   Attention:

   Ensure that **both** the inline circuit breaker **and** the circuit breaker on the back of the SP Expansion I/O Unit are in the **Off** position before connecting or disconnecting the 48-volt power cable from the SP Expansion I/O Unit.

2. Return to "Step 0420–001" on page 1-50.

Step 0420–013: All circuit breakers associated with the SP Expansion I/O Unit are in the On position but 48-volt power is not getting to the SP Expansion I/O Unit even though the 48-volt power cable has continuity on all wires.

1. Reconnect the 48-volt power cable to the SEPBU in the same connector location from which it was removed.

   Attention:

   Ensure that **both** the inline circuit breaker **and** the circuit breaker on the back of the SP Expansion I/O Unit are in the **Off** position before connecting or disconnecting the 48-volt power cable from the SP Expansion I/O Unit.

2. Switch the power cable's inline circuit breaker to the On position.

3. Measure the voltage at the SP Expansion I/O Unit end of the cable.

4. Does the voltage measure 48-volts?

   - If yes, go to "Step 0420–014."

   - If no:

     a. Place the 48 power cable's inline circuit breaker in the Off position.

     b. Go to Scalable Electrical Power Base Unit diagnostics (MAP 0540) in *RS/6000 SP: System Service Guide*.

Step 0420–014: You found that the 48-volt power cable had continuity from end to end and after you reconnected it to the SEPBU, you were able to measure 48-volts at the SP Expansion I/O Unit end of the cable.

1. Place the 48-volt power cable's inline circuit breaker in the Off position.

2. Make certain that the circuit breaker on the back of the SP Expansion I/O Unit is in the Off position.

3. Place the SP Expansion I/O Unit in the service position.

4. Perform the first **four** steps in "Removing the circuit breaker and power cable" on page 4-35.

5. Unplug P13 from the I/O planar but **do not** remove the circuit breaker.

6. Put the circuit breaker on the back of the SP Expansion I/O Unit into the On position.

7. Using a multimeter, check each wire in the circuit breaker assembly for continuity.

8. Does the breaker assembly have continuity from end to end?

- If yes:

  a. Replace the SP Expansion I/O Unit's I/O planar assembly

    – Refer to "Removing the I/O planar" on page 4-45 and "Replacing the I/O planar" on page 4-46.

  b. Reinstall the SP Expansion I/O Unit and all associated cables.

  c. Return to "Step 0420–001" on page 1-50.

- If no, go to "Step 0420–015."

Step 0420–015: The circuit breaker and cable assembly **did not** have continuity from end to end.

1. Replace the SP Expansion I/O Unit circuit breaker and power cable assembly.

  - Be sure to switch all circuit breakers associated with this SP Expansion I/O Unit to the Off position prior to reinstalling the circuit breaker assembly and the power cable.

  - Refer to "Removing the circuit breaker and power cable" on page 4-35 and "Replacing the circuit breaker and power cable" on page 4-35.

2. Reinstall the SP Expansion I/O Unit and all associated cables.

3. Return to "Step 0420–001" on page 1-50.

Bridge isolation procedure (MAP 0430)

Identify which node I/O bridge causing the problem (Bridge 0 or Bridge 1).

Bridge 0 controls PCI adapters I1, I2, I3, I4, I5 and SP Expansion I/O Unit ports Q1 and Q2

Bridge 1 controls SP Expansion I/O Unit ports Q3, Q4, Q5 and Q6.

Prior to connecting or disconnecting any SP Expansion I/O Unit cables or removing any logic or power parts, ensure the node is shutdown and powered Off from the control workstation. Switch off the 48-volt inline circuit breakers to the affected SP Expansion I/O Units and the node.

Table 1-13. Bridge isolation error codes		
Error code	**Bridge**	**Go to**
45800002	0	"Step 0430–001" on page 1-55
45800003	1	"Step 0430–008" on page 1-56
45800005	0	"Step 0430–001" on page 1-55

Step 0430–001:   One of two conditions sent you to this location. Either:

1. You received error code 45800002 or 45800005. This indicates that you have a problems with Bridge 0 and Table 1-13 sent you to this step.

2. You were not able to IPL the node in "Step 0430–008" on page 1-56.

1. Remove the SP Expansion I/O Unit cables from connectors Q1 and Q2 at the rear of the POWER3 SMP High Node.

2. Switch on the 48-volt inline circuit breakers to the node.

3. Does the node IPL?

   - If yes, problem appears to be in the SP Expansion I/O Unit loop. Go to "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.

   - If no, problem appears to be in the node. Go to "Step 0430–002."

Step 0430–002

1. Record and remove the PCI adapter cards in location I1, I2, I3, I4, and I5.

2. Switch on 48-volt inline circuit breakers to the node.

3. Does the node IPL?

   - If yes, the problem appears to be in one of the adapters you removed. Go to "Step 0430–003."

   - If no, the problem appears to be in the node I/O planar. Go to "Step 0430–006" on page 1-56.

Step 0430–003

1. Reinstall the adapters, one group at a time (I1, I2, I3) (I4, I5).

2. Switch on 48-volt inline circuit breakers to the node.

3. Does the node IPL?

   - If yes, the problem was not in this group. Go to "Step 0430–007" on page 1-56.

   - If no, the problem was in one of the adapters in the reinstalled group. Go to "Step 0430–004."

Step 0430–004

1. Remove the adapter group and install one adapter at a time.

2. Switch on 48-volt inline circuit breakers to the node.

3. Does the node IPL?

   - If yes, problem was not with this adapter.

     a. Reinstall the next adapter.

     b. Repeat "Step 0430–004."

     c. If you have reinstalled all adapters, return to "Step 0430–003."

   - If no, the problem was with this adapter. Go to "Step 0430–005" on page 1-56.

Bridge isolation (MAP 0430)

Step 0430–005

1. Replace the adapter that failed.
2. Switch on 48-volt inline circuit breakers to the node.
3. Does the node IPL?
    - If yes, problem has been resolved with **this** adapter.
        a. Reinstall the next adapter.
        b. Repeat "Step 0430–004" on page 1-55.
    - If no, the problem is not with this adapter. Go to "Step 0430–006."

Step 0430–006

1. Replace the node I/O planar.
2. Switch on 48-volt inline circuit breakers to the node.
3. Does the node IPL?
    - If yes, the problem has been resolved with **this** I/O planar.
        a. Reinstall the next adapter group.
        b. Repeat "Step 0430–004" on page 1-55.
    - If no, go to "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.

Step 0430–007

1. Reinstall the next adapter group.
2. Repeat "Step 0430–003" on page 1-55.
3. If all adapter groups have been reinstalled, reconnect SP Expansion I/O Unit cables to Q1 and Q2.
4. Does the node IPL?
    - If yes, problem has been resolved. Go to End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.
    - If no, SP Expansion I/O Unit causing the problem. Go to "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.

Step 0430–008: You received error code 45800003. This indicates that you have a problems with Bridge 1 and Table 1-13 on page 1-54 sent you to this step.

1. Remove the SP Expansion I/O Unit cables from connectors Q3, Q4, Q5, and Q6 at the rear of the POWER3 SMP High Node.
2. Switch on the 48-volt inline circuit breakers to the node.
3. Does the node IPL?
    - If yes, the problem may be in one of the SP Expansion I/O Unit loops. Go to "Step 0400–012" on page 1-35.
    - If no, the problem may be in the node. Go to "Step 0430–001" on page 1-55.

Chapter 2. Locations

Naming standard for RS/6000 SP components

The purpose of this section is to define a naming standard for all components in the RS/6000 SP system. This standard provides a consistent, logical naming convention system necessary for documentation including details, assembly drawings, schematics, manufacturing documents, service documents, and customer publications.

Format structure

The RS/6000 SP system is structured in a modular fashion with different levels of assembly which can be independently described. These levels are:

1. System level
2. Frame level
3. Major assembly level (e.g. processor node).
4. Sub-Assembly level (e.g. cards, fan assembly).

The format structure is used to individually identify any connection location at any level in the assembly. The main use of this format is to describe connector, cabling, and schematic locations shown in tables and diagrams throughout this manual.

Example of format structure: **Format:** `FRAME(WWW) - MAJOR ASSEMBLY(XXX) - SUBASSEMBLY(YY) - CONNECTOR NUMBER (ZZZZ)`

Frame (WWW)

- 1st character is the frame type:

    - E for RS/6000 SP frame

    - L for logical RS/6000 SP frame (used for models 30X and 40X)

    - S for multi-switch frame

    - C for control workstation

    - Z for another frame such as a server

- 2nd and 3rd characters are the frame number:

    - 00 for any/all frames (designates location inside any/all frames)

    - 01 - 99 for frames 1-99 (specific to that frame)

2-1

Notes:

1. E01 designates RS/6000 SP physical frame 1

2. L00 designates any/all RS/6000 SP logical frames

3. S00 designates any/all RS/6000 SP multi-switch frames

4. For locations inside a frame, the Frame (WWW) and/or Major Assembly (XXX) strings may be omitted, making the format YY-ZZZ

Major assembly (XXX)

- 1st character is the major assembly type (all three characters if the assembly occurs only once in a frame):
  - N for processor node assembly
  - S for switch assembly
  - PDU for power distribution unit assembly
  - ADC for ac/dc Converter assembly
  - FRA for frame
- 2nd and 3rd characters are the major assembly number:
  - 00 for any/all major assemblies (designates location inside any/all major assemblies)
  - 01 - 99 for major assembly 1-99 (specific to that major assembly)

Sub-assembly (YY):   1st and 2nd characters are the assembly designation inside the major assembly. (This string may be omitted in some cases.)

Refer to the lists of two-character designations associated with each major assembly throughout this chapter.

Example: SC denotes a switch card.

Connection location (ZZZZ)

- 1st character is the connection type:
  - P for plug (cable side)
  - J for jack (card/component side)
  - G for chassis ground connection
- 2nd, 3rd, and 4th characters are number identifiers. Leading zeroes may be omitted.

  Example: P102 is plug 102

Examples for using complete levels of nomenclature: To describe the jack 23 on the switch assembly bulkhead in the second RS/6000 SP frame in a four-frame configuration, designate as:

E02-S01-BH-J23

To describe plug 1 on the power card of the any switch assembly of any RS/6000 SP frame in any size system configuration, designate as:

E00-S00-PC-P1 or just PC-P1

Location diagrams of the RS/6000 SP components

See Figure 2-1 on page 2-3, Figure 2-2 on page 2-4, and Figure 2-4 on page 2-6, in the pages that follow, for views of the RS/6000 SP frame locations. Refer to the diagrams included in this section for specific views and cabling of the main component sections in the RS/6000 SP frame.

Front and rear views of RS/6000 SP frame

Figure 2-1 shows a front view of the RS/6000 SP frame locations. "Frame (FRA)" on page 2-6 describes the assembly designations for the RS/6000 SP frame.

SP Frame locations (2.01 m and 1.93 m frames) - front view

(Front cover, skirt, and air filter removed)

Figure 2-1. Front view of frame locations. See notes below.

Figure notes:

1. Wide processor nodes take up an entire shelf position (two thin processor node slots). They are identified by the odd numbered position.

2. In a F/C 2030/1 frame, switch assemblies take up an entire shelf partition. (They are identified by the even-numbered position.)

3. Processor node slots are numbered up to N16.

4. A High node or SMP High node takes up 2 shelf positions (slots). It is identified by the least odd number position of the occupied slots.

Figure 2-2 shows a front view of the RS/6000 SP multi-switch frame.

SP Switch Frame Locations - Front View

(Front Cover and Skirt, and Air Filter Removed)
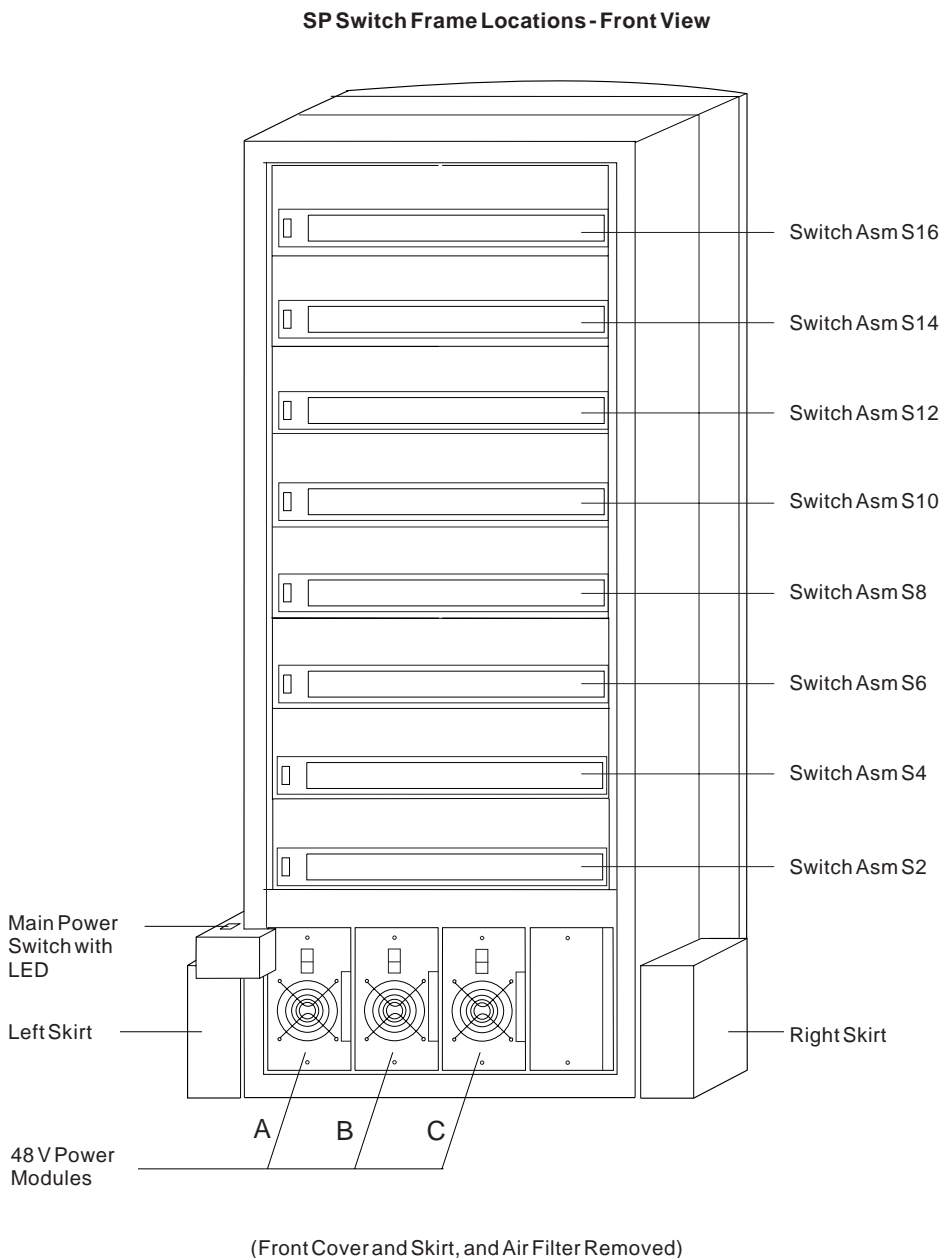
Figure 2-2. Front view of multi-switch frame locations

Figure 2-3 on page 2-5 shows a front view of the Model 3AX (1.25 m) frame.

SP Frame locations (1.25 m and 1.4 m frames) – front view

Thin Processor Node 7
(slot 7)

Thin Processor Node 8
(slot 8)

Wide Processor Node 5
(slots 5 and 6)

High Processor Node 1
(slots 1-4)

Switch assembly
(slot 17)

C (Optional)   D

48 V power module
locations

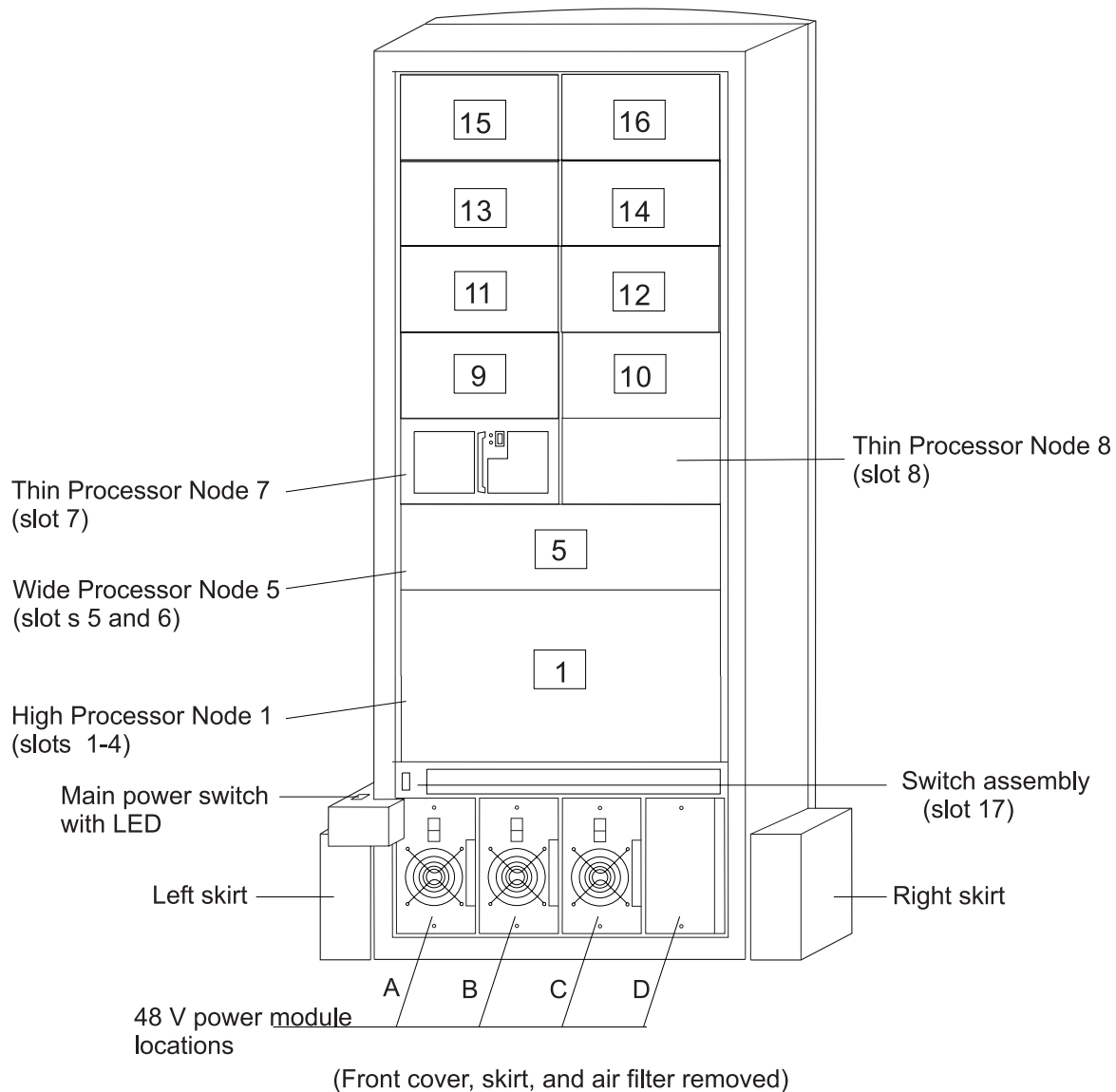(Air filter removed)
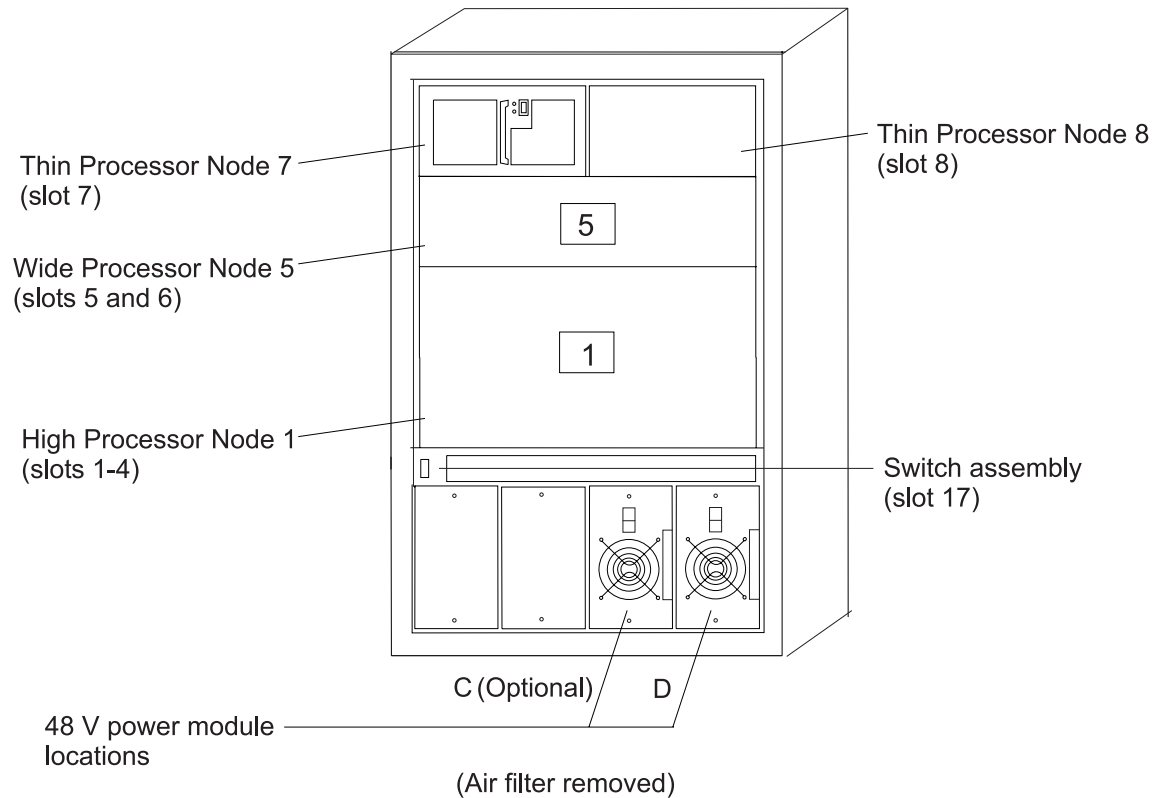
Figure 2-3. Front view of 1.25 m frame locations. See notes below.

Figure notes:

1. Wide processor nodes take up an entire shelf position (two thin processor node slots). They are identified by the odd numbered position.

2. In a F/C 2030/1 frame, switch assemblies take up an entire shelf partition. (They are identified by the even-numbered position.)

3. Processor node slots are numbered up to N8.

4. The single-phase SEPBU power unit must have a power module in position "D" (right-most slot). For N+1 operation, a power module may be installed in position "C" (next to slot "D").

5. There are no skirts on the 1.25 m frame.

6. A High node or SMP High node takes up 2 shelf positions (slots). It is identified by the least odd number position of the occupied slots.

7. The switch assembly is not available in the 1.36 m frame.

Figure 2-4 on page 2-6 shows a rear view of the RS/6000 SP frame locations.
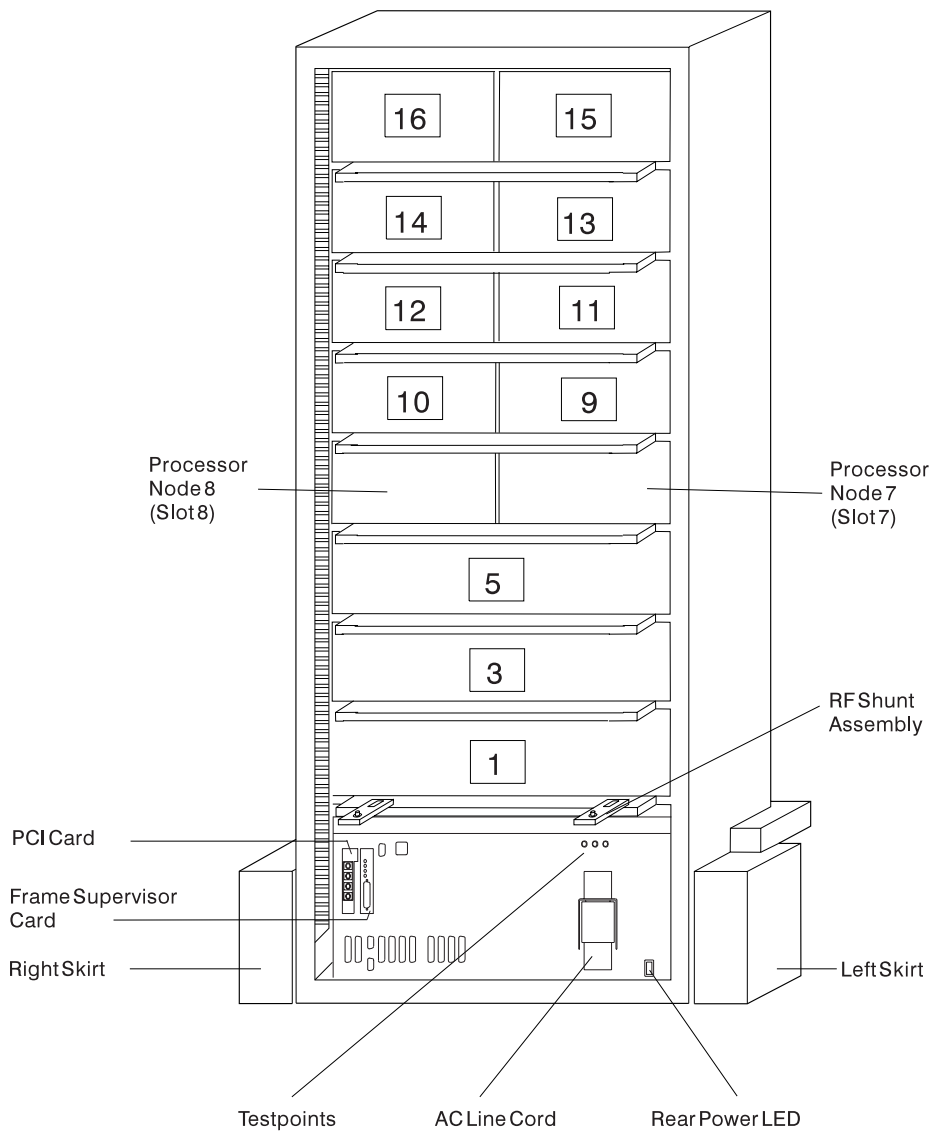
Figure 2-4. Rear view of frame locations

Note: See notes under Figure 2-1 on page 2-3 for processor node/switch assembly numbering.

Frame locations

Figure 2-1 on page 2-3 shows a front view of the RS/6000 SP frame locations, with numbered processor nodes, and the three phase SEPBU.

Frame (FRA): This list shows the designations specifically for the RS/6000 SP frame:

G1:   Right-hand rear ground

G2:   Left-hand rear ground

G3:   PDU ac ground

G4:   PDU dc ground

G5:	Input cable ground
G6:	Front door ground
G7:	Rear door ground
G8:	Ground
SW:	Power-on switch
LD:	LED card
FC:	Front cover
RC:	Rear cover

Example: E01-FRA-G1

POWER3 SMP High Node locations

Figure 2-5 on page 2-8 shows a high level component diagram of a RS/6000 SP POWER3 SMP High Node and Figure 2-6 on page 2-9 shows a top view.

Power Cards

Fan Control Card

I/O Docking Card

Riser Card

SP Expansion
I/O Interposer

Power Planar

Power Chassis

DASD Tray

DASD

Supervisor
Card

Node I/O Planar

Memory
Card

Node I/O Chassis

CPU Card

Bulkhead I/O Card

1

4

2

3

5

6

Processor Assembly
(Front half of node chassis)

System Planar

Cooling Assembly

Fan

Filter Cover

Figure   2-5. POWER3 SMP High Node high level component diagram

Power Planar (P3) (Above I/O Planar)

Power Cards

V10 V9

V8 V7 V6

V5 V2 V1

Fan Control (X1)

J10

J8 J9

V3

V4 J6

J7

J5 J4 J3

Supervisor Card (X1.1)

Bulkhead
Card

Q6 Q4 Q7 Q1
Q5 Q3 Q2

Supervisor Riser Card (X1)

SP Expansion
I/O Interposers

J9

I5 I4 I3 I2 I1

SPSMX2
Adapter (W2)

64-Bit
PCI Slots

32-Bit
PCI Slot

I/O Planar (P2)

J22

M1 M2 C1 C2 C3 C4 M3 M4

J24

Memory
Cards

CPU
Cards

CPU
Cards

Memory
Cards

J23

System Planar (P1)

Figure   2-6. Top view of POWER3 SMP High Node

Figure 2-7. POWER3 SMP High Node Node front view

Figure 2-8. POWER3 SMP High Node Node rear view
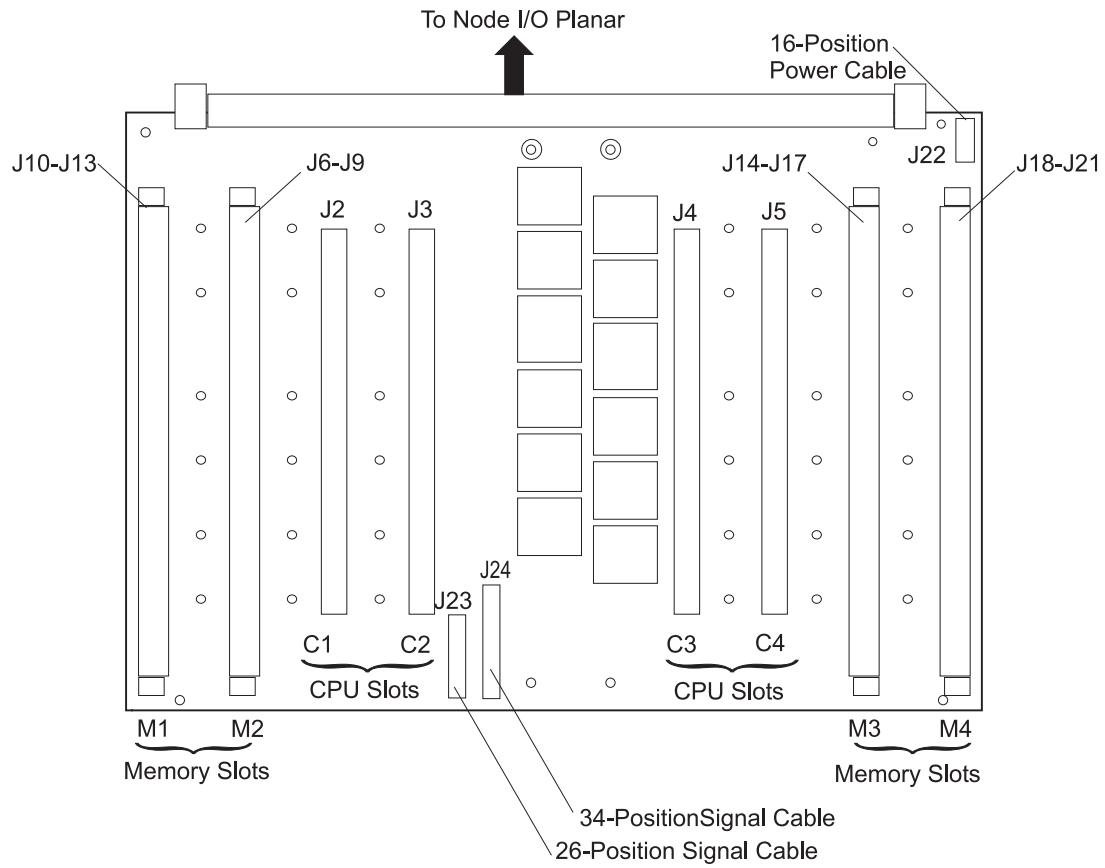
Figure   2-9. POWER3 SMP High Node system planar
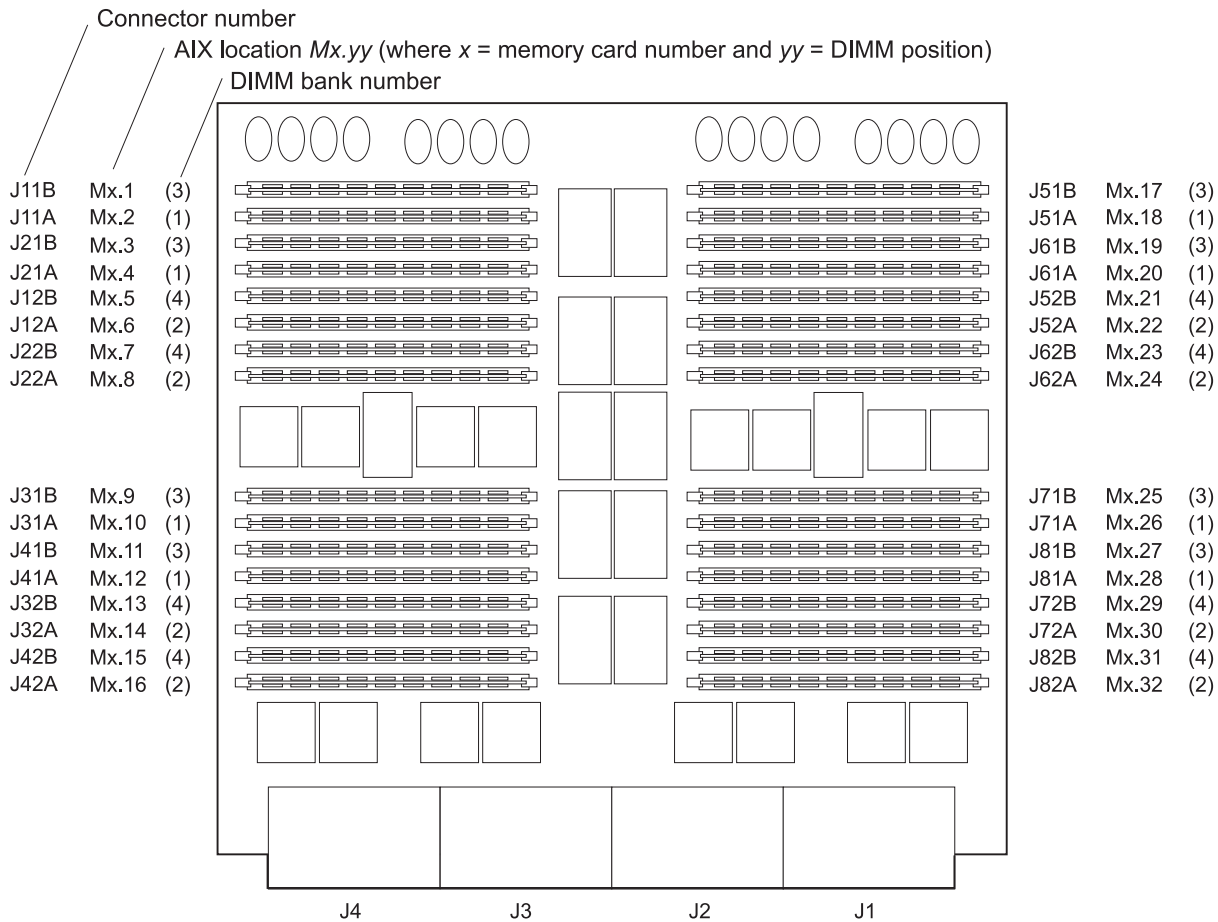
Figure 2-10. POWER3 SMP High Node memory card

Connector number
AIX location *Mx.yy* (where *x* = memory card number and *yy* = DIMM position)
DIMM bank number

J11B Mx.1 (3)
J11A Mx.2 (1)
J21B Mx.3 (3)
J21A Mx.4 (1)
J12B Mx.5 (4)
J12A Mx.6 (2)
J22B Mx.7 (4)
J22A Mx.8 (2)

J31B Mx.9 (3)
J31A Mx.10 (1)
J41B Mx.11 (3)
J41A Mx.12 (1)
J32B Mx.13 (4)
J32A Mx.14 (2)
J42B Mx.15 (4)
J42A Mx.16 (2)

J51B Mx.17 (3)
J51A Mx.18 (1)
J61B Mx.19 (3)
J61A Mx.20 (1)
J52B Mx.21 (4)
J52A Mx.22 (2)
J62B Mx.23 (4)
J62A Mx.24 (2)

J71B Mx.25 (3)
J71A Mx.26 (1)
J81B Mx.27 (3)
J81A Mx.28 (1)
J72B Mx.29 (4)
J72A Mx.30 (2)
J82B Mx.31 (4)
J82A Mx.32 (2)

J4   J3   J2   J1

DIMM Configuration

DIMMS **must** be installed in one of four groups. Each group **must** contain eight DIMMs. The four DIMM groups are: Group 1A, Group 2A, Group 1B, and Group 2B. If you are going to install more than one group of DIMMs, they should be installed in this order:

Table 2-1. POWER3 SMP High Node memory configuration		
Installation Priority	DIMM Group Identifier	DIMM Connectors
1	Group 1A	J11A, J21A, J31A, J41A, J51A, J61A, J71A, J81A
2	Group 2A	J12A, J22A, J32A, J42A, J52A, J62A, J72A, J82A
3	Group 1B	J11B, J21B, J31B, J41B, J51B, J61B, J71B, J81B
4	Group 2B	J12B, J22B, J32B, J42B, J52B, J62B, J72B, J82B

Figure   2-11. POWER3 SMP High Node I/O planar
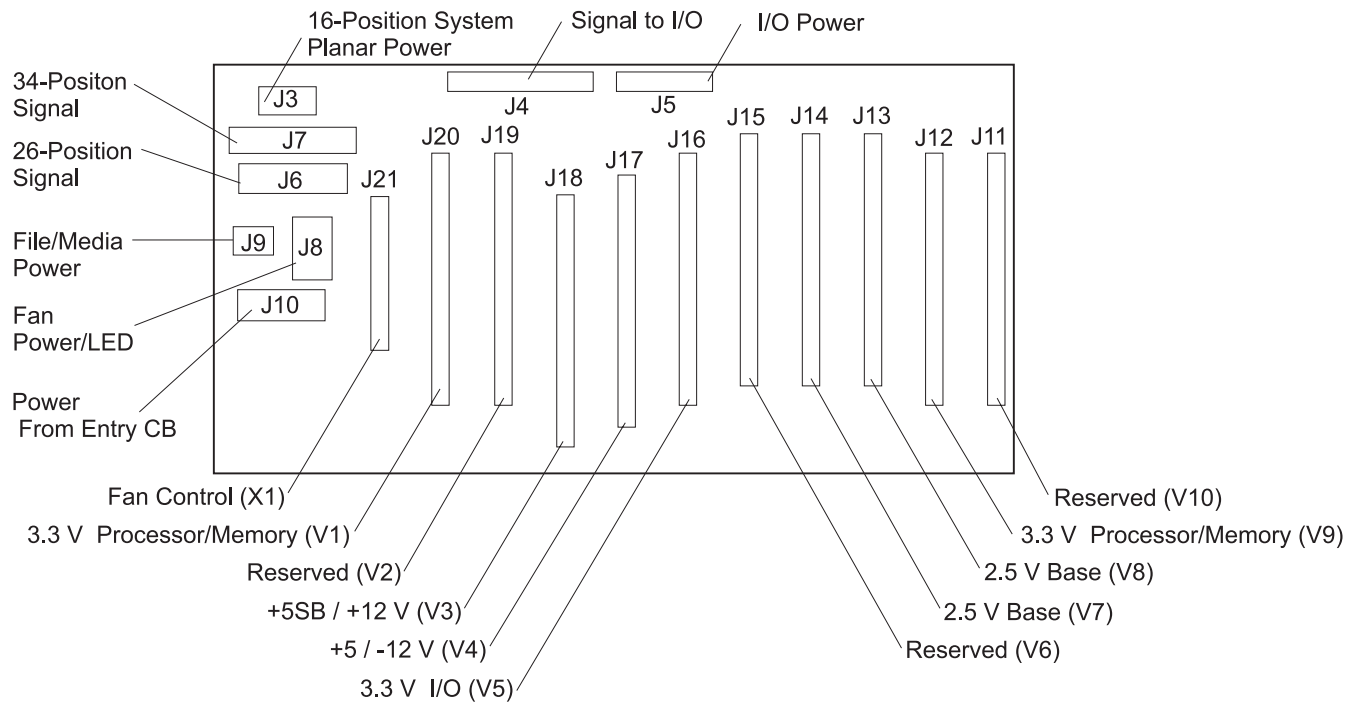
Figure   2-12. POWER3 SMP High Node power planar

SP Expansion I/O Unit locations

Figure 2-13 on page 2-14 shows a high level component diagram of a SP Expansion I/O Unit and Figure 2-16 on page 2-17 shows a top view.
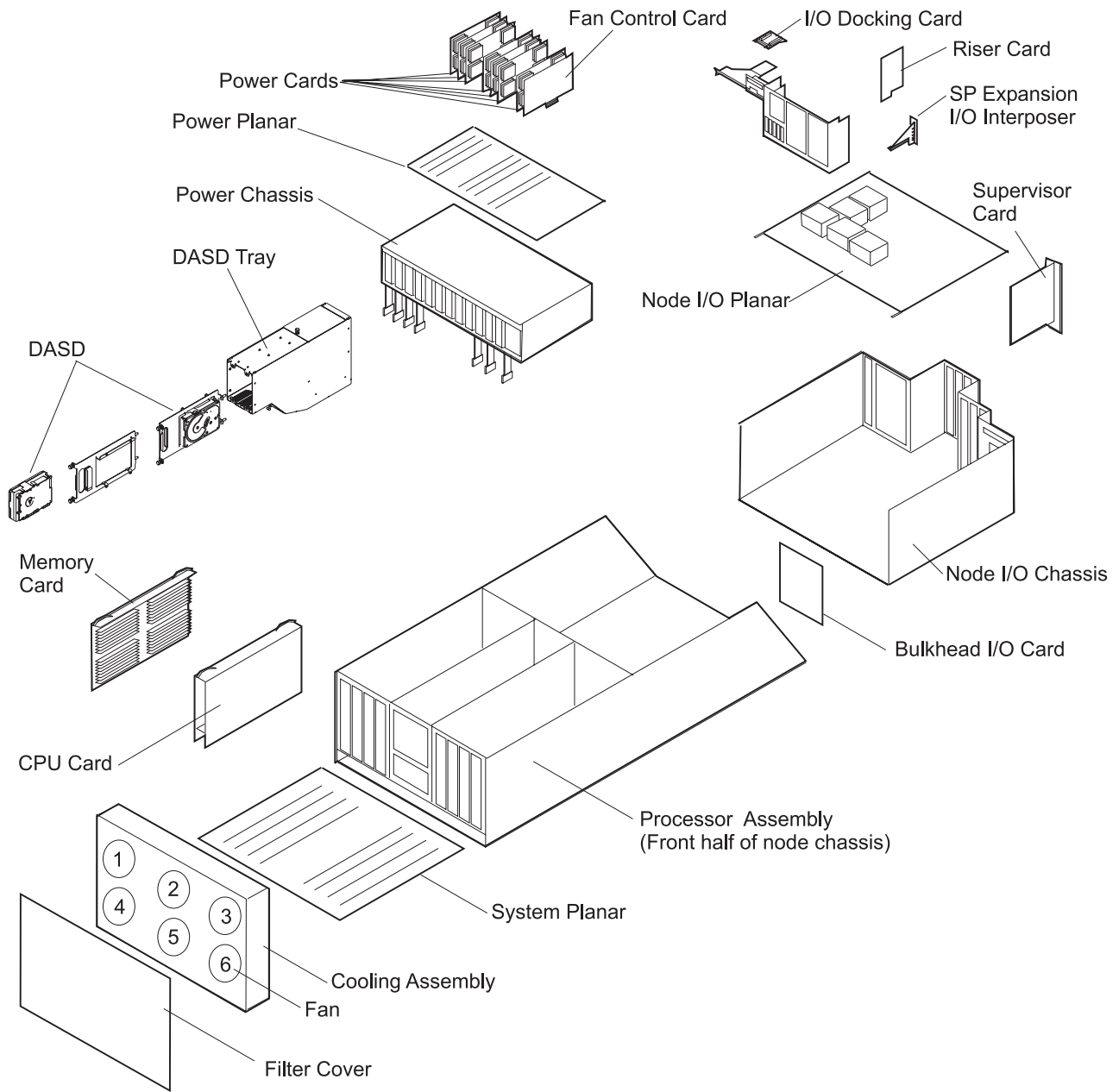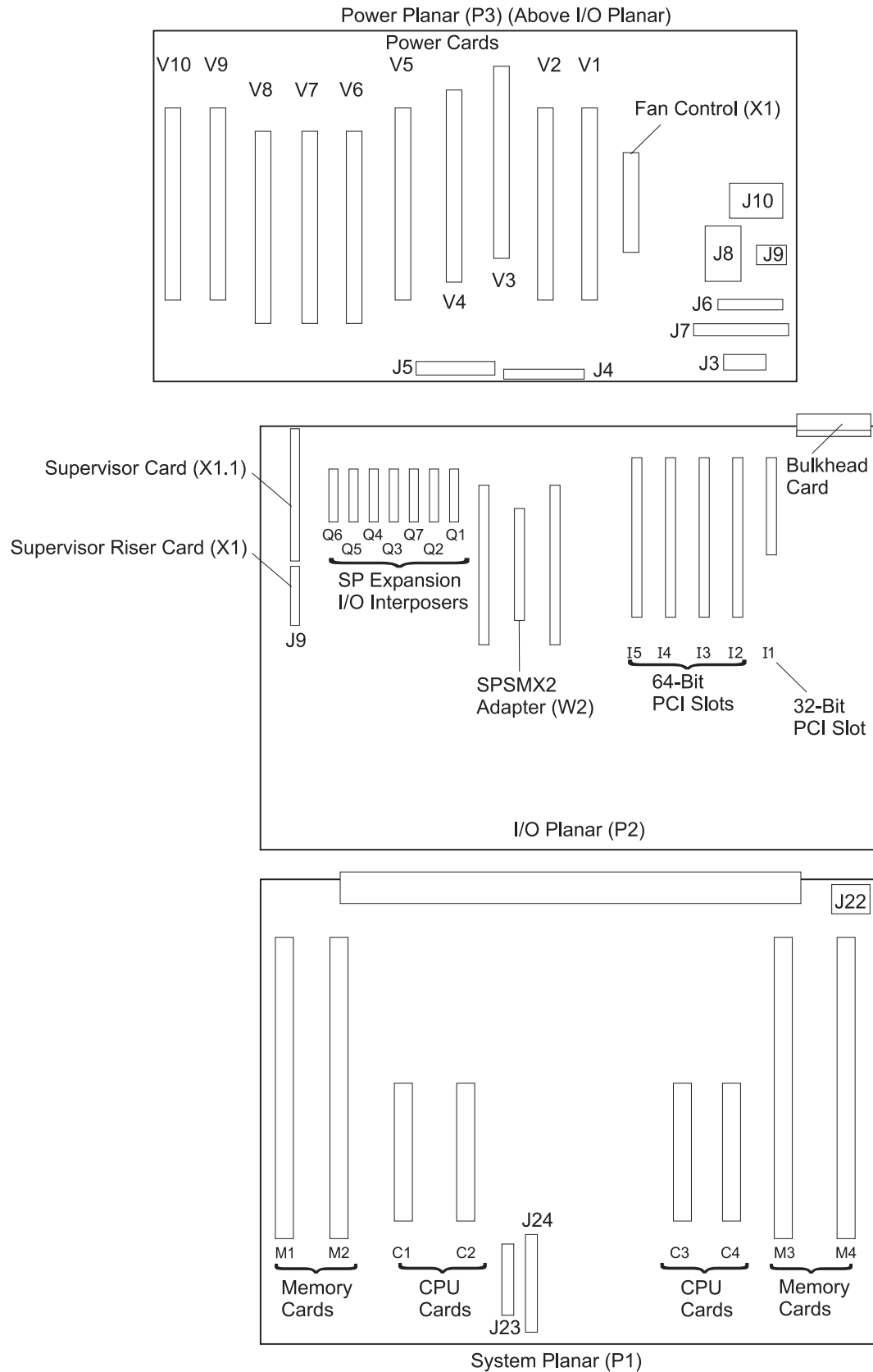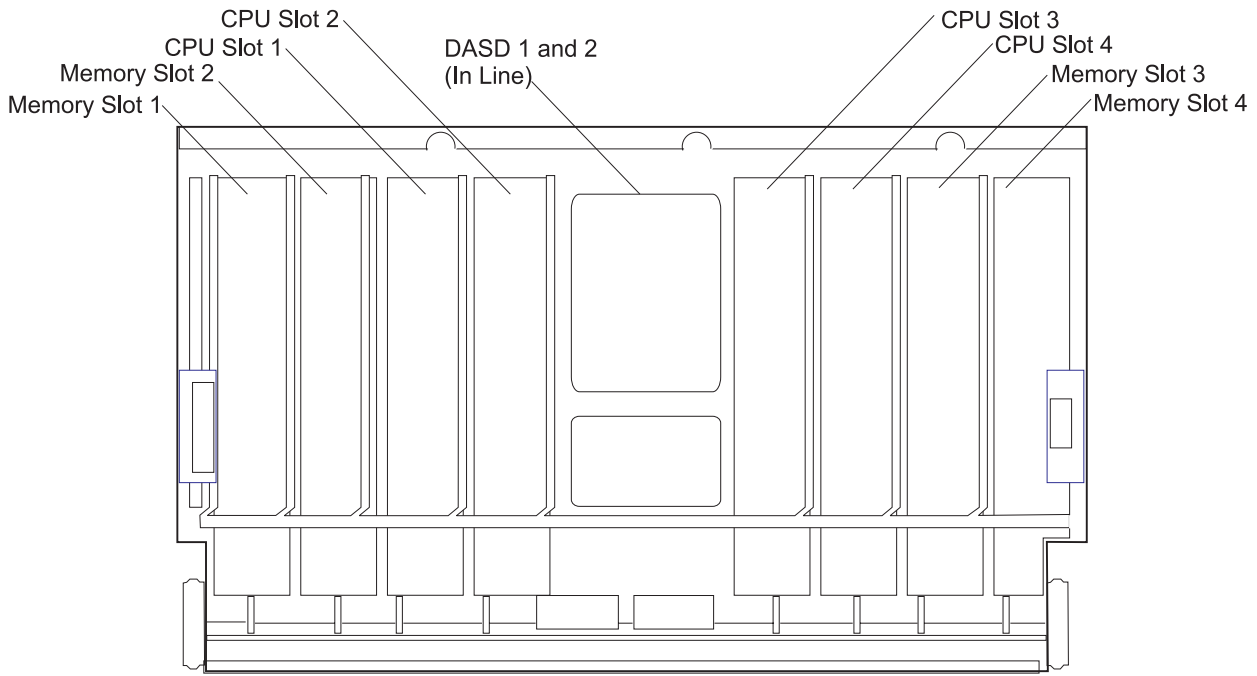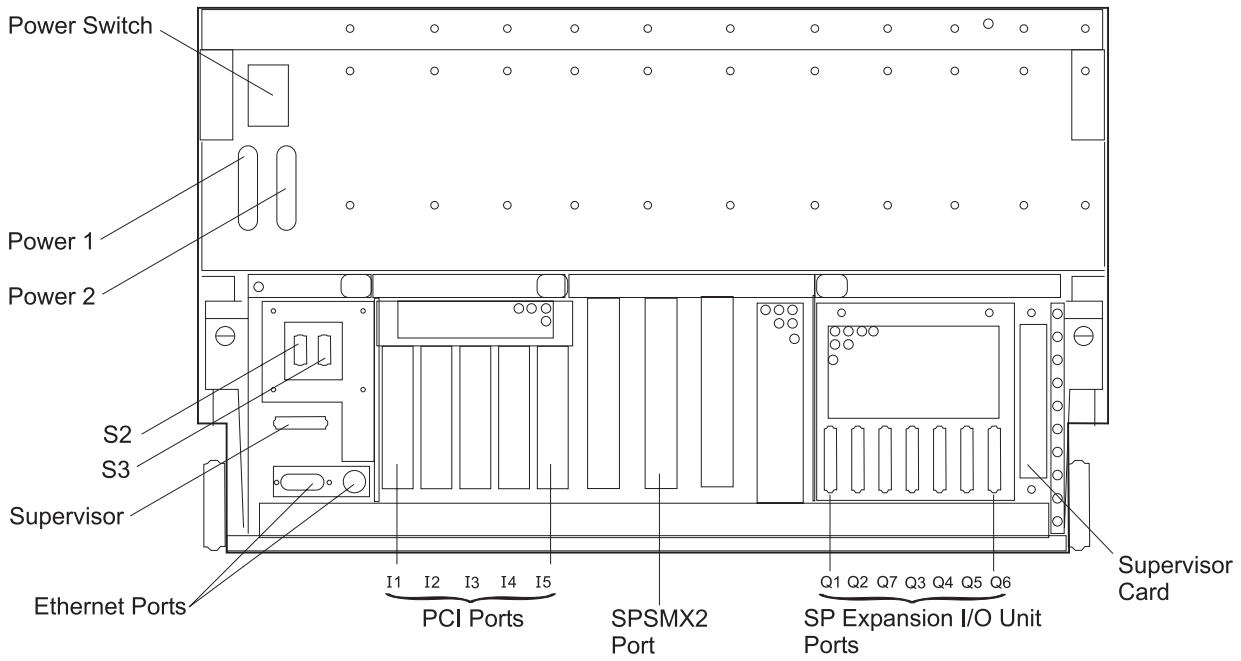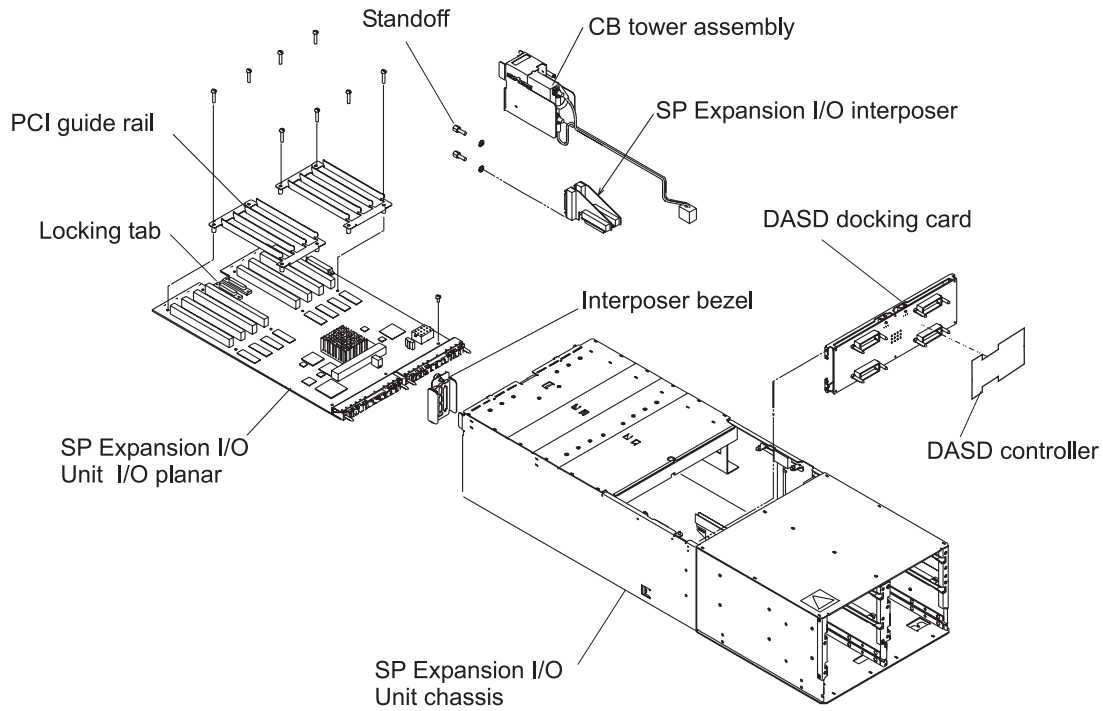
Figure 2-13. SP Expansion I/O Unit high level component diagram (1 of 2). SCSI Enclosure Services (SES) includes the DASD docking card and the DASD controller.
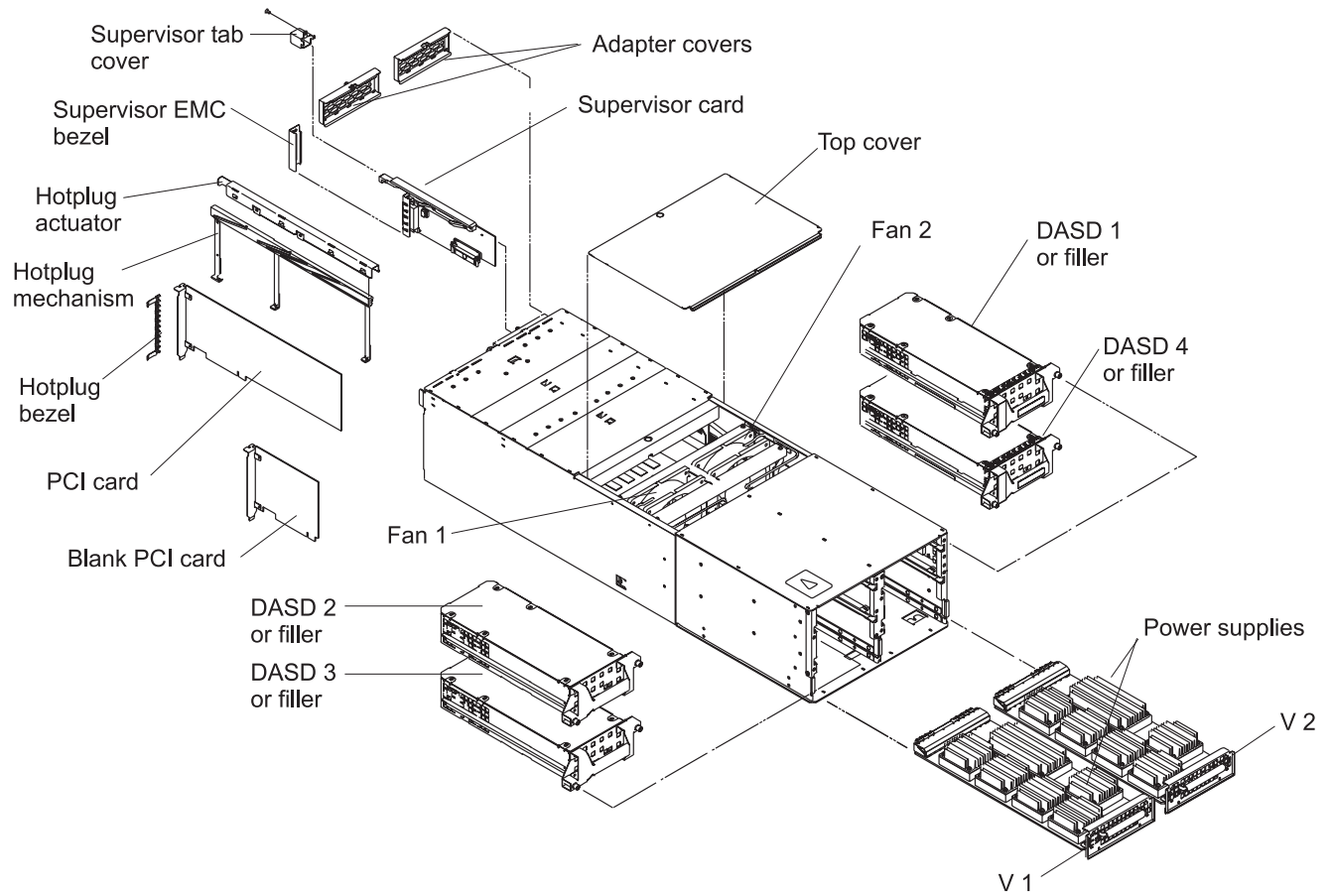
Figure 2-14. SP Expansion I/O Unit high level component diagram (2 of 2)

POWER3 SMP High Node
(rear view)

PCI slot   I1 I2 I3 I4 I5

Q1 Q2   Q3 Q4 Q5 Q6   SP Expansion I/O
interposers

PCI bus   0   1

PCI slot   I1 I2 I3 I4   I5 I6 I7 I8

PCI bus   1   0   3   2

SP Expansion I/O   Q1 Q2
interposers

SP Expansion I/O Unit
(single-unit loop, rear view)

SP Expansion I/O Units
(double-unit loop, rear view)

SP Expansion I/O Units
(double-unit loop, rear view)
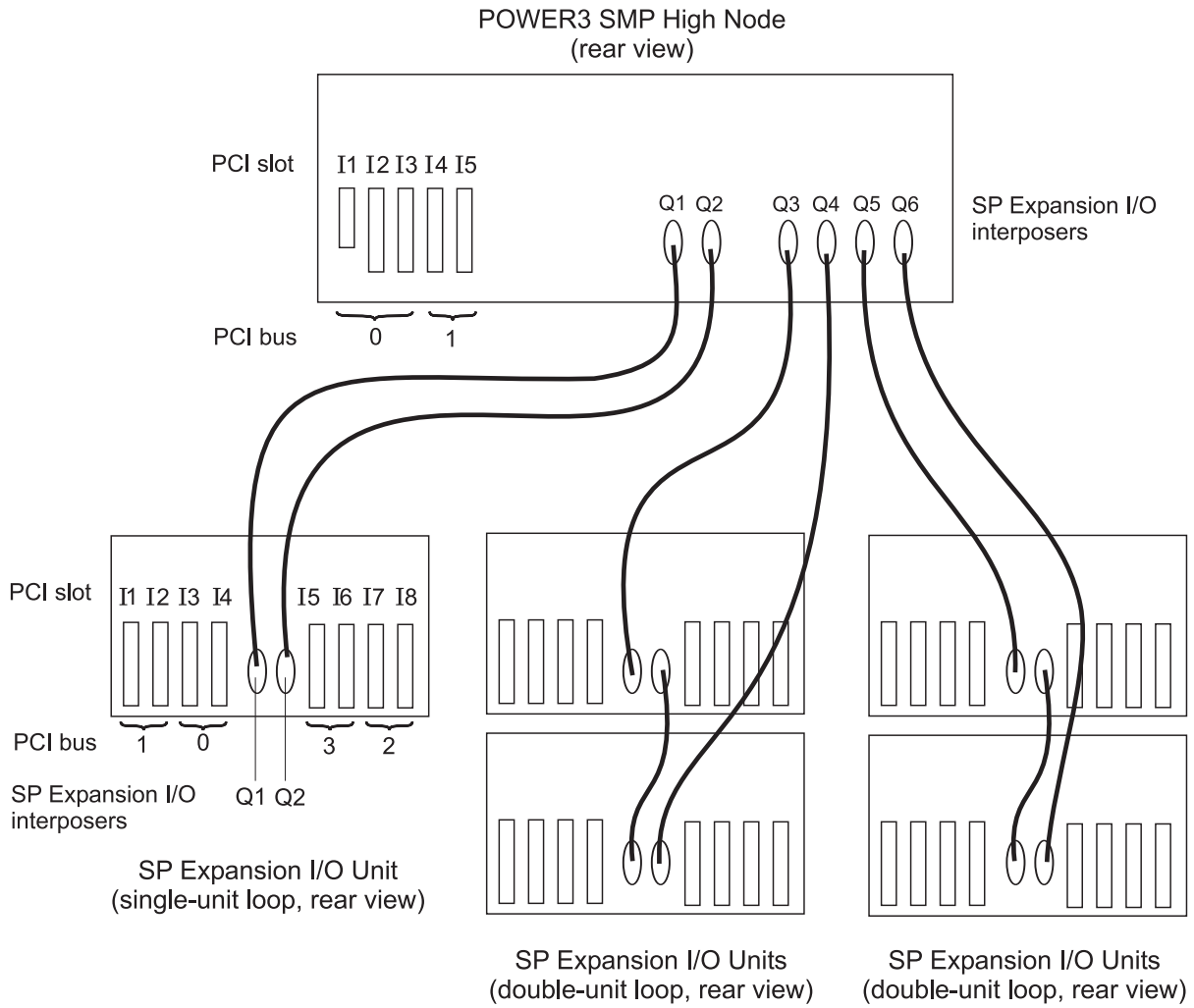
Figure   2-15. SP Expansion I/O Unit cable loop diagram
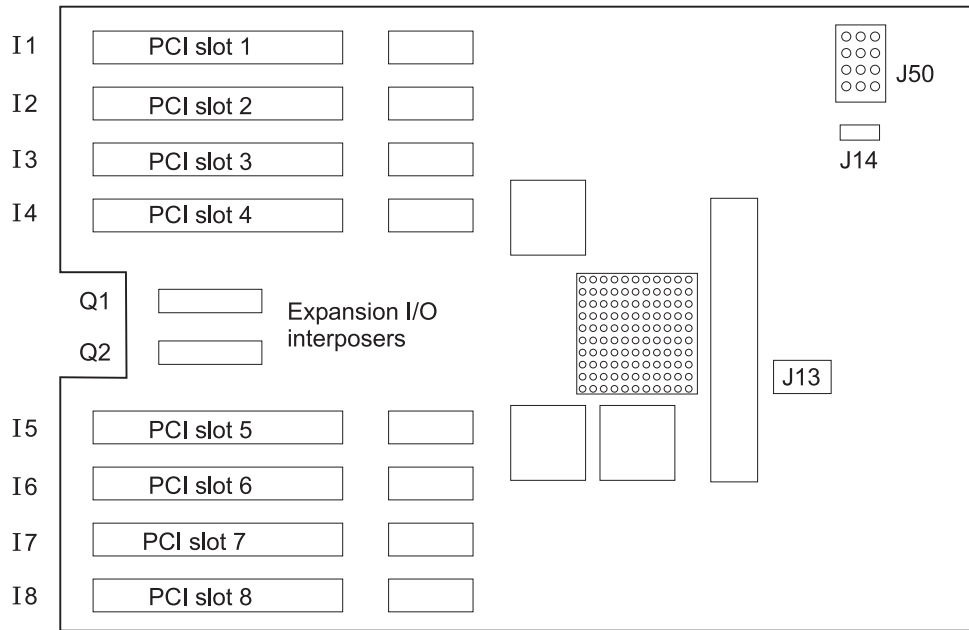
Figure 2-16. Top view of SP Expansion I/O Unit I/O planar
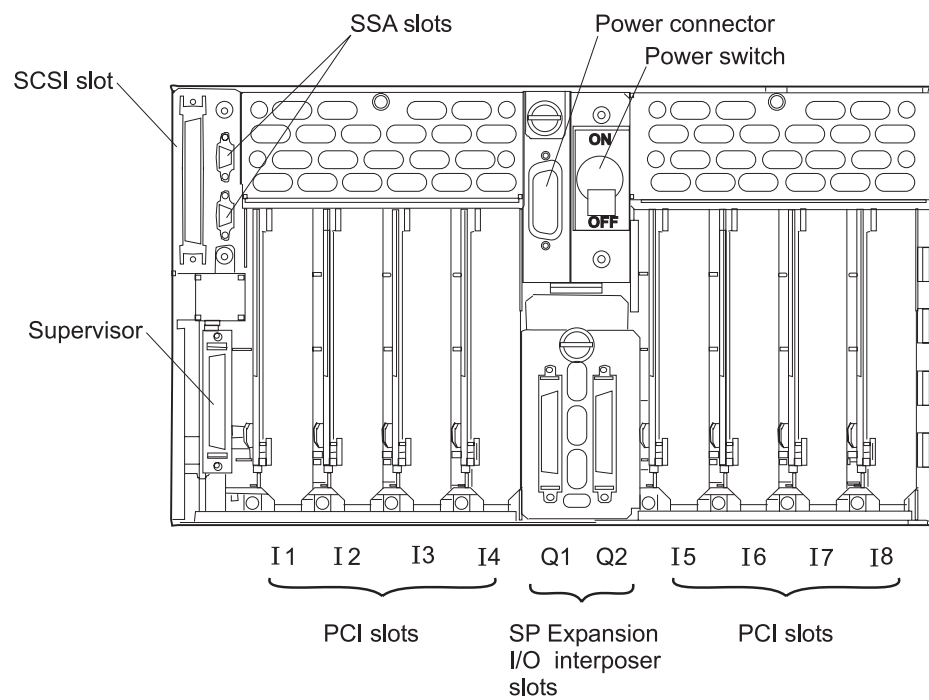
Figure 2-17. SP Expansion I/O Unit rear view

DASD 2
or filler

DASD 1
or filler

DASD 3
or filler

DASD 4
or filler

Power supply 1

Power supply 2
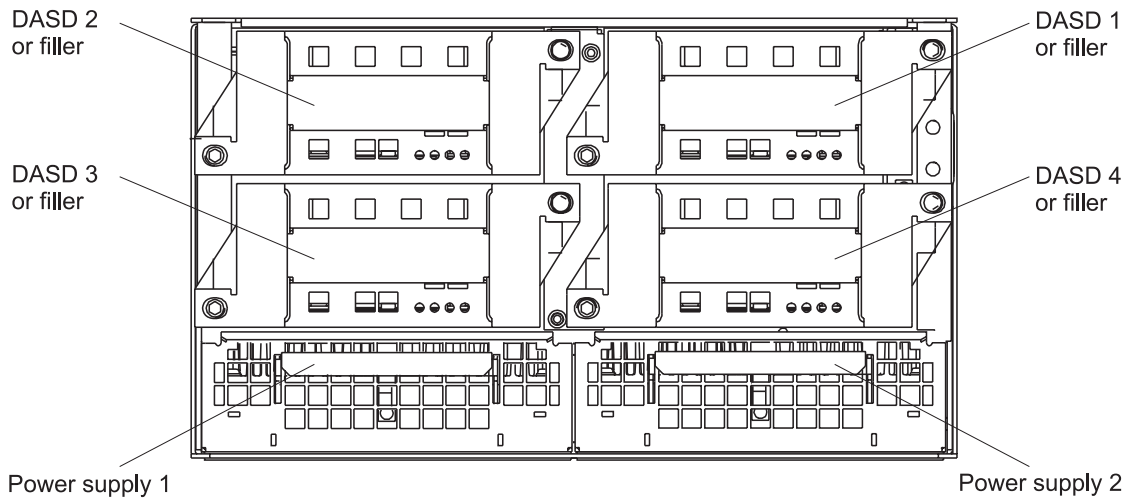
Figure   2-18. SP Expansion I/O Unit I/O planar

Connector details

Figure 2-19 on page 2-19 shows RS/6000 SP component connector details.
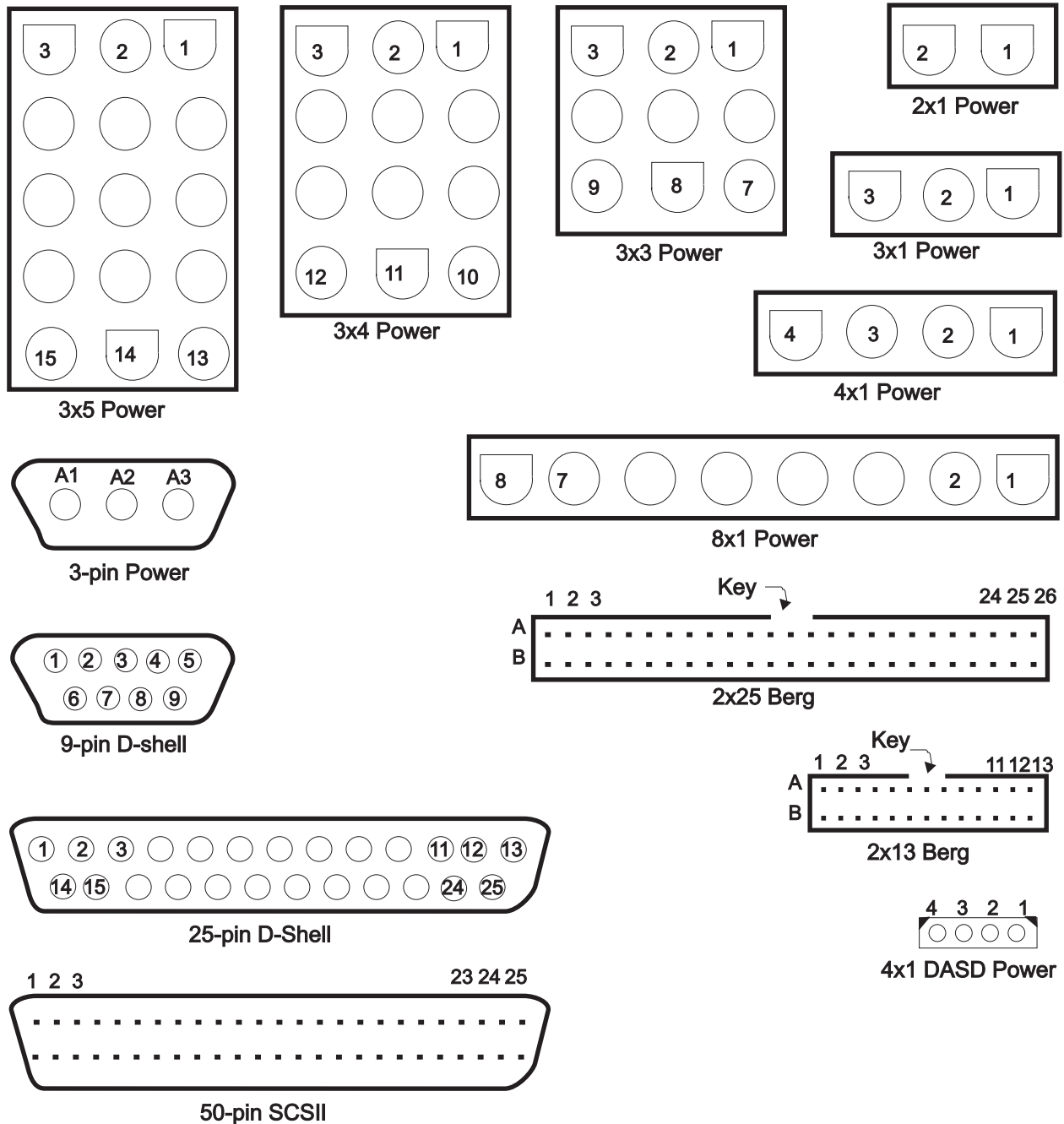
Figure   2-19. RS/6000 SP connector details (as seen at receiving ends, not at cable ends)

Cable routing

Figure 2-20 on page 2-20 and Figure 2-21 on page 2-20 show back views of the RS/6000 SP frame, showing the horizontal and vertical paths of cable routing from connector-to-connector, with the depth amplified on the drawing.

Note: When attaching exterior and interior cables to a POWER3 SMP High Node allow for enough cable for a 2-foot service loop for node movement into service position.
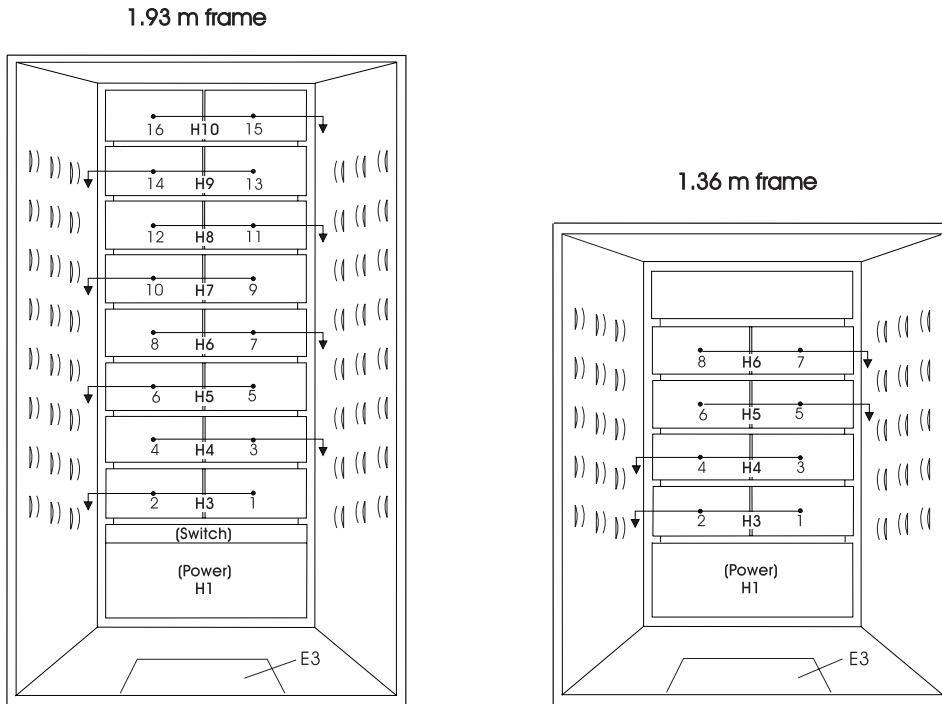
Figure 2-20. Frame cabling routing path in rear of RS/6000 SP frame — 1.93 m and 1.36 m frames
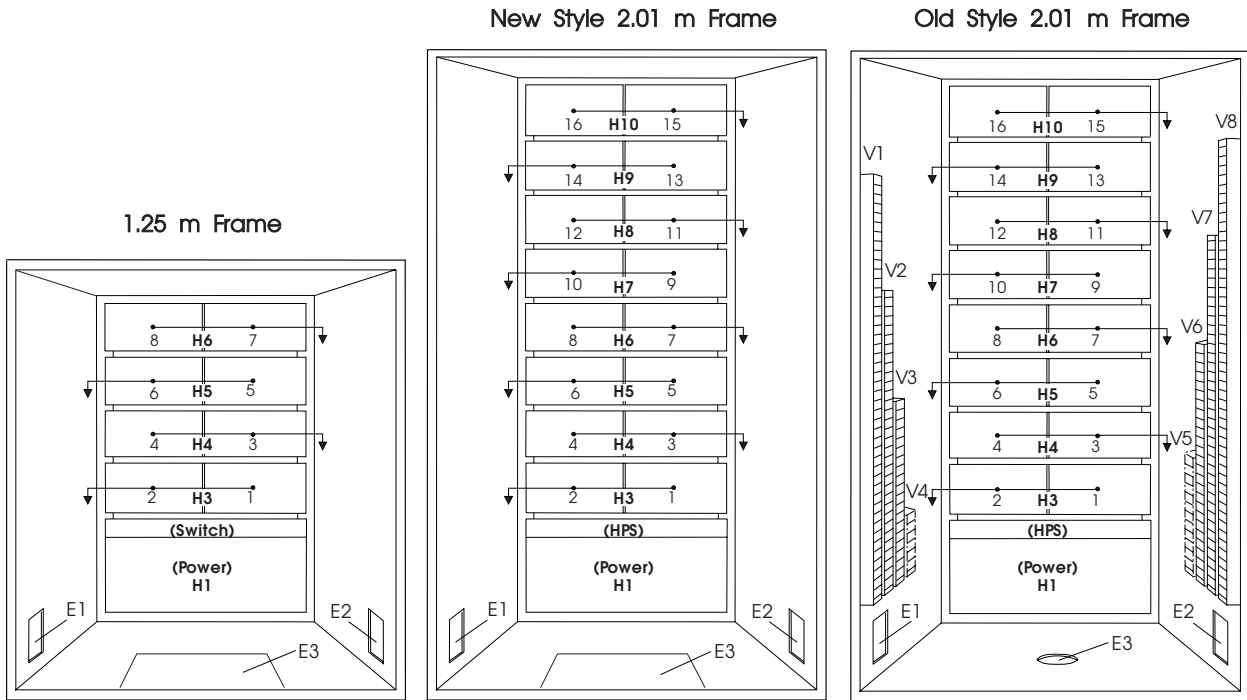
Figure 2-21. Frame cabling routing path in rear of RS/6000 SP frame — 2.01 m and 1.25 m frames

Note: For a multi-switch frame (F/C 2030/1), refer to Figure 2-20.

Table 2-2 on page 2-21 shows external cable routing in a RS/6000 SP frame populated with 16 processor nodes. (Refer to "Cable routing" on page 2-19 to see the routing paths.)

Slot Number (Node)	Cable Budget millimeters (inches)	Frame Entrance (New Style)	Frame Entrance (Old Style)	Vertical Routing (Old Style)	Horizontal Routing (Old Style)
1	1800 (71)	E3	E1	V4	H3
2	1500 (59)	E3	E1	V4	H3
3	1680 (66)	E3	E2	V5	H4
4	1980 (78)	E3	E2	V5	H4
5	2160 (85)	E3	E1	V3	H5
6	1850 (73)	E3	E1	V3	H5
7	2030 (80)	E3	E2	V6	H6
8	2340 (92)	E3	E2	V6	H6
9	2510 (99)	E3	E1	V2	H7
10	2210 (87)	E3	E1	V2	H7
11	2390 (94)	E3	E2	V7	H8
12	2690 (106)	E3	E2	V7	H8
13	2870 (113)	E3	E1	V1	H9
14	2570 (101)	E3	E1	V1	H9
15	2740 (108)	E3	E2	V8	H10
16	3050 (120)	E3	E2	V8	H10

Table 2-2. External cable routing

Chapter 3. Service procedures

Running diagnostics in a processor node

Use the following procedures for processor nodes that can be IPLed in NORMAL or SERVICE mode.

Note: If resource is not available, you must use "SERVICE mode (from disk)" or "Basic stand-alone mode (from network boot)" on page 3-3 to test the device.

Note: If you are having a problem running diagnostics and the diagnostics hang, go to *Diagnostic Information for Multiple Bus Systems* and refer to MAP 0020. After completing the problem determination procedure, return to this service guide for removal and replacement instructions.

NORMAL mode (concurrent diagnostics)

Use the following procedure for processor nodes that have already been IPLed in NORMAL mode.

Note: If the processor node has a *root* password, that password is required to perform Step 2 below. Running diagnostics from SERVICE modes does not require a *root* password.

1. Open a TTY console or telnet session to this processor node.

   TTY console:
   a. From the Hardware Perspectives screen, select the processor node
   b. Click "Actions" on the tool bar
   c. Click on the "Open TTY" button

   Telnet session:
   a. From the control workstation, find an available AIX window
   b. Click on the AIX window, then type "telnet *nodename*" and press **ENTER**
2. Log on as *root*. Ask the customer to supply or type the password, if required
3. Type "export TERM=aixterm" and press **ENTER**
4. Type "diag" and press **ENTER**
5. Press **ENTER** to continue
6. To run advanced diagnostics against a device/system, follow these procedures:
   a. Select "Advanced Diagnostic Routines" option, then press **ENTER**
   b. Select "System Verification" option, then press **ENTER**
   c. Select the device from the system, then press **ENTER**
7. Return to the MAP you came from.

SERVICE mode (from disk)

Use the following procedure for processor nodes that can be IPLed in SERVICE mode or booted using a "maintenance" image.

Note: If node is currently in use (IPLed in NORMAL mode), ask the customer to remove it from the active configuration before continuing.

1. Open a TTY console on the control workstation using the Perspectives display:
    a. Select the applicable "Node Number" in the correct frame
    b. Select "Notebook"
    c. Select "Node Status"
2. Boot from local disk:
    a. For POWER3 SMP High nodes:
        1) Reboot the node (power the node off, wait briefly, then power the node on)
        2) Immediately after the words "memory" and "keyboard" are displayed, press and hold the **6** key (for a few seconds) on the TTY console
        3) Enter any requested passwords
        4) When the diagnostic menu appears, it might ask you to set the terminal type. If so, select "Initialize Terminal" option, and define the terminal type as "LFT".
3. If booting from Ethernet LAN ("maintenance" image), make sure that the processor node has been set up to boot using a "maintenance" image. See "Selecting a processor node boot response" on page 3-6.

    a. If necessary, open the TTY console by clicking on the "Open TTY" button

    b. When the diagnostic menu appears, it might ask you to set the terminal type. If so, select "Initialize Terminal" option, and define the terminal type as "LFT".

    c. To run advanced diagnostics against a device/system, go to step 6 in "NORMAL mode (concurrent diagnostics)" on page 3-2

Basic stand-alone mode (from network boot)

Note: Use this method for AIX 4.1.3 or higher along with PSSP 2.1 and higher.

The following procedure describes how to perform a verification test of most devices on one or more processor nodes.

This procedure should be performed from a window on the control workstation.

1. From the Hardware Perspectives screen, select the processor node
2. If booting from Ethernet LAN ("diag" image), make sure that the processor node has been set up to boot using a "diag" image. See "Selecting a processor node boot response" on page 3-6.

    Note: The command should be:

    > **spbootins -r diag** *frame# slot#* **1**

3. Make sure the TTY console is closed
4. From the Hardware Perspectives window:
    a. Make sure that no processor nodes are selected, then click on the processor node(s) which you are going to verify
    b. Click on "Network Boot" button
    c. Click on "Apply" button
5. Open TTY console by clicking on the "Open TTY" button from the "Actions" tool bar for this processor node
6. A diagnostic menu appears when the processor node has completed IPL
7. When you have completed diagnostics, you can power off the processor node
8. After completion, you can set the boot response for the processor node(s) to an appropriate value. Refer to "Selecting a processor node boot response" on page 3-6 for more information.

Extended stand-alone mode (from network boot)

Note: Use this method for nodes running AIX 3.2.5 or lower.

The following section describes how to load and use an extended diagnostics image. This procedure requires additional software (shipped on an EC tape). Use only under the direction of support personnel; it might also require permission of customer to perform certain steps.

Supported functions: This image is designed specifically to support functions that cannot be provided by any other method:

1. Diagnostics on HIPPI adapters
2. Diagnostics on S/370 Channel Emulator adapters
3. Disk Format/Certify of DASD
4. Microcode download

Loading image from tape to control workstation: Perform the following procedures to load image from tape to control workstation:

1. Make sure tape drive is connected to the control workstation, and both are powered on
2. Determine the *device_name* of this tape drive (for example, rmt0)
3. Insert the EC tape into tape drive
4. From an available AIX window, type the following commands:

   cd /usr/lib/boot   tar -xvf /dev/*device_name*

5. The files then load from the tape drive
6. When complete, check file by typing:

   ls -l net.image.console

   The result is:

   ```
   -rw-r--r--    1 root    system  5592064 May 19 14:01 net.image.console
   -rwxr-xr-x    1 root    system  1228    Mar 30 13:57 net.image.console.README
   ```

Setting up the boot server: Perform the following procedures to set up the boot server:

1. From the control workstation, enter:

   splstdata -a

2. For each processor node, look under the column labeled "server" or "srvr" for the boot server number
3. If number is '0', skip to step 7
4. Find the node number corresponding to this number, and get its host name
5. Telnet to this boot server host name:

   tn *hostname*

6. FTP the file from the control workstation:

   cd /usr/lib/boot
   ftp *CWS_hostname*
           image
           cd /usr/lib/boot
           mget net.image.console*
           quit

7. Export the following directories:
   - **/etc/lpp**
   - **/etc/SP** (probably already exported)

- **/usr/lib**
- **/usr/lpp**
- **/usr/share/lib**

a. Enter:

   `smitty mknfsexp`

b. For each processor node and for each directory in the above list, enter the following:

   [Entry Fields]

   * **PATHNAME of directory to export [***directory***]**

   * **MODE to export directory read-mostly**

     HOSTNAME list. If exported read-mostly [*nodename***]**

     Anonymous UID [-2]

     HOSTS allowed root access [*nodename***]**

     HOSTS & NETGROUPS allowed client access []

     Use SECURE option? [no]

   * **EXPORT directory now, system restart or both [now]**

     PATHNAME of Exports file if using HA-NFS []

Using image on processor nodes: Perform the following procedures to use image on processor node(s):

1. Make sure the processor node(s) is off
2. Edit "/etc/bootptab" file to select this image by:
   a. Enter:

      `vi /etc/bootptab`

   b. Find the line(s) for the processor node(s) you are going to boot, then change the field:

      `... :bf=/tftpboot/NODE_IP_ADDRESS: ...`

      to:

      `... :bf=/usr/lib/boot/net.image.console: ...`

   c. Make sure to remove any "#" characters from the beginning of the lines
3. Perform "IPLing processor nodes from network device (two methods)" on page 3-7, using the manual method
4. From the TTY console(s), you might have to press the **1** and **Enter** keys to enable the console
5. In this TTY console, enter the following command:

   `diag`

6. Continue with diagnostic menus. Some additional information:
   - **HIPPI MCA**: Appears as "hippi0" in device list
   - **S/370 Channel Emulator MCA**: Appears as "chna0" in device list
   - **Disk Format/Certify**: Select "Service Aids", select "Disk Media", select "Format Disk" or "Certify Disk", select appropriate device from list
   - **Microcode Download**: Select "Service Aids", select "Microcode Download", select appropriate device from list, then select "Download the latest level of microcode"
7. When you have completed diagnostics, you might need to power off the processor node. No shutdown is required

Cleaning up the control workstation: Perform the following procedures to return the control workstation to its original state:

1. Unexport the directories:
   a. Enter:

   ```
   smitty rmnfsexp
   ```

   b. For each directory except **/etc/SP**, enter the directory name
2. Set the boot response for the processor node(s) to an appropriate value. Refer to "Selecting a processor node boot response" for more information
3. You might have to optionally remove the diagnostic boot image by entering:

   ```
   rm /usr/lib/boot/net.image.console
   ```

Selecting a processor node boot response

The following procedure describes how to select the boot response for a single processor node.

1. Determine the physical frame number (*frame#*) and slot number (*slot#*) of the processor node you want to change by entering:

   ```
   splstdata  -n
   ```

2. Check the current boot response for this processor node boot by entering:

   ```
   splstdata  -b
   ```

   For this processor node, check for a *response* field with a value from the table below; make note of this value, so you can return the processor node to this original value
3. If the *response* field is "disk", check the *install_disk* field to determine which disk it will IPL from.
4. Determine which boot response (*response*) you need to use:

response	Description
Table 3-1. Selectable processor node boot responses	
disk	Configures the processor node to boot from its local disk.
install	Configures the processor node to: boot over the Ethernet LAN, install AIX on the local disk, customize the processor node, then reboot from its target disk. **Note:** Ensure that the target disk is functioning.
customize	Configures the processor node to update node-specific information on its local disk, i.e. IP addresses.
maintenance	Configures the processor node to boot over the Ethernet LAN in maintenance mode. A maintenance menu is then displayed from which the user can select further actions.
diag (see note)	Configures the processor node to boot over Ethernet LAN in diagnostics mode. A diagnostics menu is then displayed from which the user can select further actions: • Diagnostic Routines • Service Aids • Advanced Diagnostic Routines
Note: Supported only with AIX 4.1.3 or higher and PSSP 2.1 or higher.	

5. From an available window on the control workstation, enter the following command, filling in the variables (in *italics*) with the appropriate values:

   ```
   spbootins  -r response  frame#  slot#  1
   ```

6. Make sure that the tty is closed before performing the network boot.

7. If selecting a response of "install", "customize", "diag", or "maintenance": From the "Global Controls" panel on the control workstation, click on the "Net Boot" button, click on this processor node, then click on the "Do Command" button.
8. If selecting a response of "disk": From the system monitor, power off/on processor node.
9. The processor node should now boot using the selected boot response.

Note: Remember to set the *response* field back to the original value from Step 2 once you have completed service. To do so, enter the following command, where *response* is the original value:

```
spbootins -r response frame# slot# 1
```

You can check the current *response* value by repeating step 2.

Examples of **spbootins** command:

- To configure frame# 2, slot# 2 to boot in diagnostics mode:

```
spbootins -r diag 2 2 1
```

- To configure frame# 1, slot# 4 to boot from its local disk:

```
spbootins -r disk 1 4 1
```

IPLing processor nodes from network device (two methods)

Perform one of the following procedures to make a processor node IPL from network:

Method one: network boot method

1. From the SP Perspectives Launch Pad, select "Hardware Perspectives"

2. Select the processor nodes you are going to boot from a network

3. Click the "Actions" option on the menu bar

4. Click the "Network Boot..." option

   - The Network Boot dialog box opens

5. In the dialog box, verify the nodes selected, then click "Apply"

6. IPL from network device begins

   Note: On POWER3 SMP High Nodes, the LED/LCD value stops at **E1F1** for an extended time and will appear to be hung. This is a normal stop. If necessary to monitor and verify activity, open a read-only TTY connection to that node.

   Note: If Packets Received always shows "00000", there is a network or configuration problem.

Method two: manual (hand-conditioning) method

1. If applicable, have customer shutdown the processor node (or nodes)
2. From the SP Perspectives Launch Pad, select "Hardware Perspectives"
3. Click on the processor nodes you are going to network boot
4. From the "Actions" button, select "Change Key Switch" and "Secure", then click on "Apply" button
5. From the "Actions" button, select "LCD and LED Display"
6. From the "Actions" button, select "Power on...." for the node
7. From the "Actions" button, select "Open TTY" for the node
8. When the LEDs reach **200**
   a. Select "Change Key Switch" from the "Actions" button on the tool bar
   b. Change the key to "Service" and click the "Apply" button

c. Then **immediately** click on "Actions", "Power off, Reset...". Select "Reset" then click on "Apply" button.
9. The LEDs should show **1xx**, then proceed to **26x**.
10. From the TTY console, look for "MAIN MENU". If you get a "SELECT LANGUAGE" screen, select language if necessary, then enter "99" to return to main menu.

POWER3 SMP High Node

1. Open TTY connection to the node
2. Switch on node power
3. When the RS/6000 banner scrolls across the screen, immediately press **1** after the word "Keyboard" shows on the bottom line

   Note: Only press the **1** key one time.

4. Select option **3** "Remote Initial Program Load Setup"
5. Select option **1** to set IP parameters. The parameters are normally found in the customers */etc/hosts* file
6. Select option to verify adapter setup. This option helps verify the data rate is set correctly
7. Select option **3** to do a test "ping"

   If all parameters are set correctly, the test ping returns the message "Ping Success"
8. Return to the Main Menu and select option **8** "Multiboot"
9. At the prompt, enter **5** "OK Prompt" and answer **yes** to the question
10. At the **0>** prompt, enter **boot** and press **Enter**

The packet count advances and a screen defining the system console appears. Follow normal diagnostic procedures.

---

11. Enter "1" to "Select BOOT (Startup) Device".
12. From the "SELECT BOOT (STARTUP) DEVICE" menu, select the number corresponding to the network that you will be IPLing from.

    Note: For POWER3 SMP High Nodes, this is usually done over the built-in Ethernet.

13. When you get to the "SET OR CHANGE NETWORK ADDRESSES" menu, make sure that either all addresses show "000.000.000.000" (IPL from anywhere) **or** the "Client address" (node IP address), "BOOTP server address" (IP address of workstation containing IPL image), and optional "Gateway address" are correct.

    Note: If IP addresses are modified, make sure to later reset them to appropriate values; otherwise, Network Boot function might not work properly.

14. When you have completed this menu, enter "99" to return to the main menu.
15. From the "MAIN MENU", you might optionally run the step "Send Test Transmission (PING)" to test network connection. The test requires that you supply IP addresses.
16. From the "MAIN MENU", enter "4" to "Exit Main Menu and Start System (BOOT)".
17. From the node front panel, put the processor node in NORMAL mode by clicking on the "Normal" button.
18. From the "STARTING SYSTEM (BOOT)" menu, press ENTER to continue.
19. IPL from network device should now begin. LEDs will remain at **231** until IPL image has completed transfer.

    Note: If Packets Received always shows "00000", there is a network or configuration problem.

Updating the Ethernet hardware address

Perform the following steps to update the Ethernet hardware address:

1. If necessary, have customer shut down and power off the processor node.
2. Close the console TTY window (if opened).
3. Delete node entry from **/etc/bootptab.info** file on the control workstation. (Do this if the file exists and the node entry in the file exists.)
4. Use the **sphrdwrad** command to obtain the new Ethernet hardware address:
   a. Determine *frame#* and *slot#* of this processor node.
   b. Issue the following command from the control workstation:

   sphrdwrad *frame#* *slot#* **1**

5. Copy the collected address into **/etc/bootptab.info**
6. If the node was powered down, power it back on.

Checking errors using "errpt"

The following section describes how to use the **errpt** command to access error log information and how to interpret the information in the error log.

Using the "errpt" command

Note: You can also use **smit errpt**.

errpt −**?**   Will return a list of various parameters with descriptions.

errpt −**a** −**N sphwlog** │ **pg**
          Shows detailed list of RS/6000 SP-specific hardware errors.

errpt −**a** −**N sphwlog** −**T PERM** │ **pg**
          Shows detailed list of RS/6000 SP-specific hardware failures requiring service action (for example, shutdown condition)

errpt −**a** −**N sphwlog** −**T TEMP** │ **pg**
          Shows detailed list of RS/6000 SP-specific hardware warnings.

Interpreting "errpt" output for "sphwlog" errors

The following describes how to read various relevant sections of the results of an "errpt –a ..." command. For an example, refer to "Sample "errpt –a ..." output report" on page 3-10.

Date/Time   Date and time that event was logged.

Node Id   Workstation where the information was logged; not processor node.

Type   Indicates status/priority of the error. For hardware errors:

   - PERM (Permanent)—Used to indicate higher priority errors where service is required (for example, shutdown condition or frame supervisor not responding)
   - TEMP (Temporary)—Used to indicate lower priority errors, where a momentary or minimal impact condition has occurred; maintenance could be deferred (for example, warning condition)
   - UNKN (Unknown)—Used for informational messages (for example, node has been powered off)
   - PEND (Pending)—Used to indicate conditions expected to impact system availability soon.

Resource Name

"sphwlog" refers to items logged for RS/6000 SP-specific errors.

Error Description/Probable Causes/Failure Causes/Recommended Actions

Use this section for quick reference; however, Maintenance Analysis Procedures (MAPs) in Volume 2 should be used to perform full service action since they provide more detailed analysis and procedures.

Diagnostic Explanation

To interpret, look for the following key items:

1. "Condition cleared" (end of line)—indicates error condition no longer present. Error has been fixed or has cleared on its own; check for intermittent conditions.
2. Severity:
   - "Failure"—indicates higher priority problem, (for example, shutdown)
   - "Warning"—indicates lower priority problem.
3. Component:
   - "Frame #:0"—indicates error concerns frame #.
   - "Node #:#" — indicates error concerns frame #, node in slot address #, respectively.
   - "Switch #:#" — indicates error concerns frame #, switch in slot address #, respectively.
4. Variable—refers to specific variable on which condition was detected (for example, "nodefail1").
5. Error message—specific message indicating the problem that was detected (for example, "Supervisor not responding for slot."). This message is used by the MAPs to help isolate and service this error.

Sample "errpt −a ..." output report

```
ERROR LABEL:     SPMON_EMSG101
ERROR ID:        A1843F1E

Date/Time:       Wed Sep 14 13:29:38
Sequence Number: 9217
Machine Id:      000016691C00
Node Id:         workstn3
Class:           H
Type:            PERM
Resource Name:   sphwlog
Resource Class:  NONE
Resource Type:   NONE
Location:        NONE


Error Description
UNABLE TO COMMUNICATE WITH REMOTE NODE

Probable Causes
SYSTEM I/O BUS

Failure Causes
SYSTEM I/O BUS


        Recommended Actions
        CHECK CABLE AND ITS CONNECTIONS


Detail Data
DETECTING MODULE
LPP=PSSP,Fn=splogd.c,SID=1.8,L#=666,
DIAGNOSTIC EXPLANATION
0026-101 Failure; Frame 1:0; nodefail1; Supervisor not responding for slot.
------------------------------------------------------------------------
```

Node supervisor self-test

The following procedures will help you perform self-test on the node supervisor cards. Upon completion of this test, return to the procedure that sent you here.

1. Disconnect the node supervisor cable from the rear of the node.
2. Locate LED 5. See Figure 3-1 on page 3-12.

48 Volt "B" Present (On = Yes)	4 ◯	◯ 8	Not Used
48 Volt "A" Present (On = Yes)	3 ◯	◯ 7	Not Used
Supervisor Power (On = Yes)	2 ◯	◯ 6	Not Used
Node Power Status (On = OK)	1 ◯	◯ 5	Environment Status or Base Code Active (On = Problem)
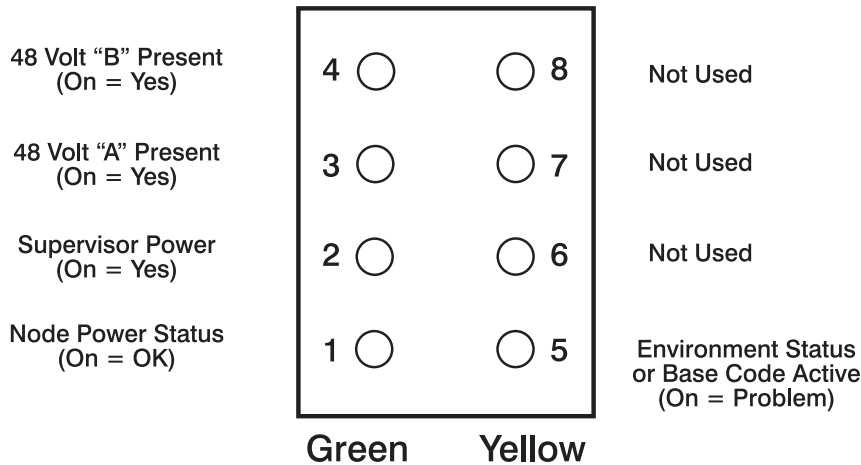
Green   **Yellow**

Figure 3-1. POWER3 SMP High Node LEDs

3. Reconnect the node supervisor cable at the rear of the node.
4. Check the green and yellow LEDs on the node supervisor card.

This self-test should indicate one of the following conditions for the processor node:

Self-test Conditions

Pass sequence

1. All 8 LEDs will be on for 10 seconds
2. LED 5 will flash node address
3. All 8 LEDs will be on for 1 second

Fail conditions

- Green and Yellow LEDs never light
- LED 5 flashes wrong address

Base Code

1. All 8 LEDs will be on for 10 seconds
2. LED 1 will flash node address
3. LED 5 is On

Verification tests using Perspectives

This section gives you the basic information needed to check the supervisor cards on a single node, frame, or switch.

Node supervisor verification

From the Hardware Perspectives window:

1. The Hardware Perspective should open with a node pane displayed. If it does not, or if you would like to open an additional node pane:

   a. Click the "Add Pane" icon on the tool bar

      - The Add Pane dialog box opens

    b. From the "Pane Type" pulldown, select "Nodes"

    c. Select your choice of adding the pane to the current window or to a new window

    d. If desired, enter a new pane title

    e. Click "OK" to open the pane and close the dialog box

2. In the Node pane, click the icon of the node you want to verify
3. Click the "Notebook" icon on the tool bar

    • When the Notebook window opens, make certain that the "Node Status" tab is selected

4. The "Node failure:" attribute displays the status of the node supervisor

    • "No" displayed in a **green** box indicates that the node supervisor **has not failed** and the supervisor is responding

    • "Yes" displayed in a **red** box indicates that the node supervisor has failed and it **is not responding**

    Note: Clicking "Help" in the Notebook window's lower right corner displays attribute descriptions.

Frame supervisor verification

From the Hardware Perspectives window:

1. Unless you have saved display settings, the Hardware Perspective does not open with a frame pane displayed. To open a frame pane:

    a. Click the "Add Pane" icon on the tool bar

      • The Add Pane dialog box opens

    b. From the "Pane Type" pulldown, select "Frames and Switches"

    c. Select your choice of adding the pane to the current window or to a new window

    d. If desired, enter a new pane title

    e. Click "OK" to open the pane and close the dialog box

      • You may repeat these steps to add additional frame panes

2. In the Frame and Switch pane, click the icon of the frame you want to verify
3. Click the "Notebook" icon on the tool bar

    • When the Notebook window opens, make certain that the "Frame Status" tab is selected

4. The "Controller responds:" attribute displays the status of the frame supervisor

    • "OK" displayed in a **green** box indicates that the frame supervisor **is responding**

    • "No response" displayed in a **red** box indicates that the frame supervisor **is not responding**

    Note: Clicking "Help" in the Notebook window's lower right corner displays attribute descriptions.

Switch supervisor verification

From the Hardware Perspectives window:

1. Unless you have saved display settings, the Hardware Perspective does not open with a switch pane displayed. To open a switch pane:

    a. Click the "Add Pane" icon on the tool bar

- The Add Pane dialog box opens

  b. From the "Pane Type" pulldown, select "Frames and Switches"

  c. Select your choice of adding the pane to the current window or to a new window

  d. If desired, enter a new pane title

  e. Click "OK" to open the pane and close the dialog box

- You may repeat these steps to add additional switch panes

2. In the Frame and Switch pane, click the icon of the switch you want to verify

- A switch icon is displayed next to the frame icon **only if** a switch is installed in the frame

3. Click the "Notebook" icon on the tool bar

- When the Notebook window opens, make certain that the "Switch Status" tab is selected

4. The "Node failure:" attribute displays the status of the **switch** supervisor.

- "No" displayed in a **green** box indicates that the switch supervisor **has not failed** and the supervisor is responding to communication from the frame supervisor.

- "Yes" displayed in a **red** box indicates that the switch supervisor has failed and it **is not responding** to the frame supervisor.

  Note: Clicking "Help" in the Notebook window's lower right corner displays attribute descriptions.

Base code verification

Perform the following procedure to check for supervisor conditions that require action.

1. From the control workstation window, enter:

    `smitty supervisor`

2. The following menu is displayed:

```
    Check For Supervisors That Require Action (Single Message Issued)
>   List Status of Supervisors (Report Form)
    List Status of Supervisors (Matrix Form)
    List Supervisors That Require Action (Report Form)
    List Supervisors That Require Action (Matrix Form)
    Update *ALL* Supervisors That Require Action (Use Most Current Level)
    Update Selectable Supervisors That Require Action (Use Most Current Level)
```

  Select the second option, "List Status of Supervisors (Report Form)"

3. A frame, similar to the following example, is displayed:

```
spsvrmgr: Frame   Slot   Supervisor   Media         Installed      Required
                         State        Versions      Version        Action
          _____  _____  _____   _____    _____     _____
          1       0      Active       u_10.3c.0706  u_10.3c.0709   None
                                      u_10.3c.0707
                                      u_10.3c.0709

          _____  _____  _____   _____    _____     _____
                  4      Active       u_10.36.0700  u_10.36.0703   None
                                      u_10.36.0701
                                      u_10.36.0703

          _____  _____  _____   _____    _____     _____
                  7      Active       u_10.3e.0700  u_10.3e.0703   None
                                      u_10.3e.0701
                                      u_10.3e.0703

          _____  _____  _____   _____    _____     _____
                  17     Active       u_80.09.0609  u_80.09.060b   None
                                      u_80.09.060b
```

Updating the node supervisor code

1. If they are not already on, turn the node's circuit breakers to the On ('1') position.
2. Enter:

   smitty supervisor

3. Select "List Supervisors That Require Action"
4. Note the frame number and slot number
5. Hit PF3 (Cancel).
6. Select "Update Selectable Supervisors That Require Action"
7. Enter the frame number and slot numbers to be updated.

   Note: This will take at least 12 minutes to complete.

8. Perform "Resetting the clock and bootlist after servicing a node" on page 3-16 before returning to the procedure that directed you here.

Service position procedures

Note: When preparing to place processor nodes and switch assemblies into the service position, ensure that the customer has removed the processor nodes and switch assemblies from the active configuration.

Placing a POWER3 SMP High Node into the service position

1. If necessary, fence the node from the system.
2. Ensure the node has been shutdown and powered off before continuing.
3. Set the circuit breaker at the node rear panel in the Off ('0') position.
4. Set the circuit breakers in the 48-volt power cables in the Off ('0') position.
5. Remove the two 48-volt power cables from the rear of the node.
6. Remove the supervisor cable from the node by disconnecting the supervisor bus connector from the supervisor extension cable.
7. If necessary, remove the Ethernet BNC cable from the rear of the processor node.
8. Loosen the screws on the two rear locking levers and pull the locking levers toward you to disengage the I/O assembly from the CEC assembly.
9. If performing service on the CEC or power assembly, continue.
10. Refer to "Removing the cooling assembly" on page 4-6 to gain access to the front of the node.

Note: When sliding the node out of the frame, make certain that the cable loops are able to fully extend.

Removing a POWER3 SMP High Node from the service position

1. Refer to "Replacing the cooling assembly" on page 4-6 to replace the cooling assembly and node front panel.
2. Slide the I/O assembly against the CEC assembly and engage the two locking levers by pushing toward the node to connect the two assemblies.
3. Tighten the locking lever screws.
4. If necessary, install the Ethernet BNC cable in the rear of the processor node.
5. Install the supervisor cable to the node by connecting the supervisor bus connector to the supervisor extension cable.
6. Install the two 48-volt power cables in the rear of the node.
7. Set both circuit breakers on the 48-volt power cables in the On ('1') position.
8. Set the circuit breaker on the node rear panel in the On ('1') position.
9. If necessary, unfence the node.

Placing an SP Expansion I/O Unit into the service position

1. Ensure the attached POWER3 SMP High Node has been shutdown and powered off from the control workstation before continuing
2. Set the circuit breaker at the SP Expansion I/O Unit rear panel in the Off ('0') position
3. Set the circuit breaker in the power cable in the Off ('0') position
4. If performing service on the DASD docking card, planar, LED card, fan, CB assembly or any internal cable, continue with the remainder of this procedure to remove the unit from the frame. If performing service on other components, stop here and go to the applicable service procedure.
5. Record external cable locations at the rear of the unit and label if necessary
6. Remove cables attached to the rear of the unit
7. Remove the unit from the frame and place it on an ESD approved surface to continue service

Removing an SP Expansion I/O Unit from the service position

1. Install the SP Expansion I/O Unit in the frame
2. Install any cables removed from the rear of the unit
3. Set the circuit breaker on the 48 v power cable in the On ('1') position
4. Set the circuit breaker on the unit rear panel in the On ('1') position
5. Return to the procedure that sent you here

Resetting the clock and bootlist after servicing a node

When servicing a node, the node becomes disconnected from its power source for a period of time. Since nodes normally do not have a real battery, the NVRAM will loose it's memory when disconnected from power for about 10 minutes (sometimes less). This will cause the date to be reset to January 1, 1970, and the bootlist to be cleared. This can cause some problems with booting.

It is **highly recommended** to reset the clock and bootlist before booting the node. This is done as follows:

1. Before powering down the node to be serviced, display the current bootlist:
    a. Run diagnostics (**diag**)
    b. Choose the "Service Aids" panel
    c. Choose the "Display/Alter Bootlist" panel
    d. Choose "Normal Mode"
    e. Choose "Display Current Bootlist"

This will display the current bootlist.

2. Power down the node, service it, and hook it back into the frame.
3. On the control workstation, run **spbootins** to set the node to boot in maintenance mode. For example, if it is node 12 of frame 2, enter:

```
spbootins -r maintenance 2 12 1
```

4. On the control workstation, netboot the node:
   a. From the SP Perspectives Launch Pad, select "Hardware Perspectives"
   b. Select the processor nodes you are going to boot from a network
   c. Click the "Actions" option on the menu bar
   d. Click the "Network Boot..." option

   - The Network Boot dialog box opens

   e. In the dialog box, verify the correct nodes are selected, then click "Apply"
   f. IPL from network device begins

   Note: On POWER3 SMP High Nodes, the LED/LCD value stops at **E1F1** for an extended time and will appear to be hung. This is a normal stop. If necessary to monitor and verify activity, open a read-only TTY connection to that node.

   Note: If Packets Received always shows "00000", there is a network or configuration problem.

5. When the node boots, a console window will pop up on your display. Follow the prompts:
   a. "Start Maintenance Mode for System Recovery"
   b. "Access a Root Volume Group"
   c. "Continue"
   d. Choose correct disk from the list
   e. Access this volume group and start a shell
6. In the maintenance shell, set the date command. For example, to set the date to August 3, 1995, do "date 0803123095"
7. In the maintenance shell, set the boot list.
   a. Run diagnostics (**diag**)
   b. Choose the "Service Aids" panel
   c. Choose the "Display/Alter Bootlist" panel
   d. Choose "Normal Mode"
   e. Choose "Alter Current Bootlist"
   f. Set the bootlist the way it was before the node was serviced
8. Close the console window
9. On the control workstation, set the node to boot from disk. For example:

```
spbootins -r disk 2 12 1
```

10. On the control workstation, use Perspectives to power off the node and then power it back on.

    The node will now boot from the device that you specified in step 7 with the correct time.

Installing firmware updates on SP nodes

Firmware updates (for example, IPL ROS updates for SP nodes or system and service processor firmware updates for POWER3 SMP High Nodes), are available at **http://www.rs6000.ibm.com/support/micro/download.html**. Alternatively, you can search AIXTOOLS for the latest versions of the firmware updates. (for example, look for **CHRP_IPL** on AIXTOOLS for the latest version of IPL ROS on SP Nodes.)

Follow the instructions in the README file within the package.

Installing adapter microcode packages

Certain adapters are shipped with an adapter firmware diskette. For factory configured systems, the micro-code is installed on the SP nodes. However for field installations the adapter firmware must be installed.

This adapter firmware must be installed on the SP nodes along with the adapter. The following procedure outlines the adapter microcode installation. Updates are periodically made to microcode and your service representative can search AIXTOOLS for the latest version of Adapter Microcode.

The following 3 adapters **require** functional microcode to be installed:

Adapter	Package
ESCON Control Unit Adapters Feature 2756	ESCON
BLKMUX S/370 Control Unit Feature 2755	BLKMUX
FDDI Adapters Features 2723, 2724, 2725, 2726	FDDI

These adapters **might** need updating to the latest level in their FLASH EPROM:

Adapter	Package
SSA Adapters Features 6214, 6216, 6217, 7133 Drives	SSAFLASH
SCSI Adapters Features 2412, 2415, 2416	ECA192
Note: The ECA192 instructions differ from the above and are included with the ECA192 Package.	

Note: This procedure is similar to that used for performing software updates (PTF's) to SP nodes. You can Refer to *RS/6000 SP Installation Guide* (GC23-3898) Section 5, "Performing Software Maintenance" for a general idea of how to perform the installation.

1. Locate the diskette (either shipped with your adapter or obtained from the TOOLS disk.
2. Copy the adapter microcode to a temporary directory on the control workstation:
   a. Insert the diskette in the control workstation diskette drive
   b. Log on as *root*.
   c. Select a name in a temporary directory to store the microcode image such as "/tmp/microcode" or "/tmp/escon"
   d.

   `bffcreate -l -d /dev/fd0`

   This will list the contents of the diskette. Record the package name results (for example, escon.cuu). This will be useful if you decide to store other adapter microcode in the same directory.
   e.

   `bffcreate -t /tmp/microcode -d /dev/fd0 all`

   This will copy the data to the designated directory and update a table of contents file (.toc)
3. NFS Export that directory to the nodes:

   `exportfs -i /tmp/microcode`

4. Either use the **dsh** command to control one or more nodes directly from the control workstation, or telnet to each individual node. (Commands in following steps would be executes as in the example, but without the "dsh" prefix)

   Note: Refer to *IBM RS/6000 SP: Administration Guide* for help on using **dsh**.

5.

```
dsh -a "umount /mnt"
```

6.

```
dsh -a "mount <control wks>:/tmp/microcode /mnt"
```

7.

```
dsh -a "installp -qacXd /mnt all"
```

The "all" can be replaced by the individual microcode package as recorded earlier.

8.

```
dsh -a "umount /mnt"
```

9.

```
exportfs -u /tmp/microcode
```

To complete the microcode update, it is usually necessary to remove and then replace the device from the configuration. The most reliable method to do this is to reboot the node. Some adapters can actually require a power off cycle to complete the microcode update. Others can be updated simply by running **cfgmgr**.

Note: During microcode download for SSA adapters, there is a possibility that the download process could result in an error. When an unrecoverable error (loss of power) occurs during the download process the adapter can be left with no microcode. If this happens, repeat the microcode download. If unsuccessful, replace the adapter.

7133 Disks can also be updated, however the method varies, depending upon which disks are attached. If they are 4.5GB or 9.1GB "Scorpion" disks, and the AIX version is either 4.1.5 or 4.2.1, then run **dsh "ssadload -u"** to update the disks. Other disks will be updated by a **cfgmgr** or reboot cycle.

Verifying the POWER3 SMP High Node configuration

Use this procedure to diagnose SP expansion I/O unit configuration problems on a node that boots OK and there are no environmental problem indicators.

Verify the attached SP expansion I/O units are properly configured

---
Wiring SP expansion I/O units

SP Expansion I/O Units connect to a POWER3 SMP High Node in loop configurations. A loop requires two connectors on the SP Expansion I/O Unit and two connectors on the POWER3 SMP High Node. The high node cables must plug into corresponding pairs (for example, Q1 and Q2, Q3 and Q4, Q5 and Q6).

There are single and double SP Expansion I/O Unit loops. A single loop starts at the node, connects to the SP Expansion I/O Unit, then returns to the corresponding port on the node. This requires two cables between the node and the SP Expansion I/O Unit. The double (two SP Expansion I/O Unit loop) consists of a cable from the POWER3 SMP High Node to the SP Expansion I/O Unit, a cable to a second SP Expansion I/O Unit, and a third cable returning to the corresponding node port. The left and right SP Expansion I/O Unit ports (Q1 and Q2) are used interchangeably, either cable can be plugged in either port. The node ports, however, must be plugged in corresponding pairs.

---

1. Log into the host node and check the configuration to see that it recognizes the SP Expansion I/O Unit PCI buses using the command: **lscfg | grep pci** . There are two entries for the host node and four entries for each attached SP Expansion I/O Unit. Count the SP Expansion I/O Units cabled to the node. (number of PCI buses) = 2 + [4 x (number of SP Expansion I/O Units)]

   For more details on configured units, issue the command: **lscfg -v | pg**. Scroll and look for PCI entries. A typical entry looks like:

   ```
   pci4              00-c8a00000       PCI Bus
         Device Specific.(YL)........U1.13-P1
   ```

   The Device Specific location U1.13-P1 calls out the SP Expansion I/O Unit location. In this example, U1.13 indicates Frame 1 node 13. This entry confirms that this PCI bus has been properly configured.

2. **IF:**

   - All PCI buses have been properly configured, go to 7 on page 3-22 to check for adapter card information.

   - All PCI buses or SP Expansion I/O Units are not configured:

     All buses are missing for a given SP Expansion I/O Unit SP Expansion I/O Unit is not configured, go to 3

     SP Expansion I/O Unit is configured, but missing some PCI buses Go to "Bridge isolation procedure (MAP 0430)" on page 1-54.

3. The SDR contains some diagnostic information on the SP Expansion I/O Unit cables. This information is written from the supervisor card during node boot.

   After the node has booted, the SDR can be read by issuing the command **splstdata -x** on the control workstation.

   A menu similar to the following screen is displayed.

   ```
              List Node Expansion Information

   expansion# frame# slot# slots associated_node node_port node_cables
   expansion_interconnect
   ----------------------------------------------------------
   ------------------
       13      1    13     1     5               Q1          1
   1
       14      1    14     1     5               Q2          1

   node# expansion_list
   ------------------------------------
   ```

   There is an entry in this table for each SP Expansion I/O Unit. The SDR data entries refer to the following:

   expansion# The location "node number" of the SP Expansion I/O Unit.

   frame#   Frame where the SP Expansion I/O Unit is located.

   slot#   Node slot within the frame where the SP Expansion I/O Unit is located.

   slots   Number of slot locations used (**1** for this product)

   associated_node Host POWER3 SMP node number

node_port Port number on the back of the POWER3 SMP Node where the SP Expansion I/O Unit is cabled.

node_cables Number of cables from the SP Expansion I/O Unit to a POWER3 SMP Node (**2** for a single loop configuration and **1** for a double SP Expansion I/O Unit loop configuration.)

expansion_interconnect Number of cables from the SP Expansion I/O Unit to another SP Expansion I/O Unit (**0** for a single loop configuration and **1** for a double SP Expansion I/O Unit loop configuration)

Note: If the node has not completed this portion of the boot cycle, an entry "data_not_available" is returned for *node_port*, *node_cables*, and *expansion_interconnect*. Therefore, any of the data returned by this command is valid as of the last boot of the POWER3 SMP High Node.

If the entry for the SP Expansion I/O Unit is missing, the unit is not installed properly (see the installation procedure in *RS/6000 SP: Installation and Relocation*.

An SP Expansion I/O Unit wired in a single loop configuration will show 2 *node_cables* and 0 *expansion_interconnect* cables.

SP Expansion I/O Units wired in a double loop configuration will show 1 *node_cables* and 1 *expansion_interconnect* cables.

4. Verify that all cables are recognized in the script.

   - If all cables are recognized in the script, go to 7 on page 3-22 and check internal node diagnostics.

   - If all cables are not recognized:

   -
     Single loop Go to 5.

     Double loop Go to 6.

5. The SP Expansion I/O Unit is cabled in a single loop but the attachment cables are not recognized. The single loop consists of a POWER3 SMP High Node, a cable from the node to the SP Expansion I/O Unit and a second cable returning from the SP Expansion I/O Unit to the corresponding port on the POWER3 SMP High Node. The connections at the node must be in corresponding port pairs.

   The output of the **splstdata -x** command should have an entry for each of the SP Expansion I/O Units. Check any cable that is not recognized by this script. Also, verify that the interposer connectors are properly seated. If there are still problems, the SP Expansion I/O Units should be individually called as single loops, then go to 3 on page 3-20.

   Note: The POWER3 SMP High Node and SP Expansion I/O Units must be powered down before reconfiguring the cables.

6. The SP Expansion I/O Unit is cabled in a double loop but attachment cables are not recognized.

   The double loop consists of a POWER3 SMP High Node, a cable from the node to the SP Expansion I/O Unit, a second cable from that unit to second SP Expansion I/O Unit, and a third cable returning to the corresponding node port. The connection at the node must be in corresponding port pairs. The output of the diagnostic script should indicate:

   ```
   ..Cable to node detected
   ..RIO to RIO cable detected
   ```

   Check any cable that is not recognized by this script, also verify that the interposer connectors are properly seated. If there are still problems, the expansion units should be individually cabled as a single loop, then go to 3 on page 3-20.

   Note: The POWER3 SMP High Node and SP Expansion I/O Units must be powered down before reconfiguring the cables.

7. SP Expansion I/O Unit configures properly and PCI buses are present.

   - Go to MAP 0100 in the RS/6000 SP: System Service Guide and trouble shoot as a problem with missing or additional resources.

Servicing SP Expansion I/O Unit SCSI devices (SES)

The information contained in Table 3-2 and illustrated in Figure 3-2 will help you interpret the information you obtain about SCSI devices.

Table 3-2. SCSI DASD LED definitions			
LED # (color)	Status indicated	State	Definition
1 (yellow)	Disk status	On	Disk error
		Off	Normal operation
2 (green)	Power status	On	Disk power on
		Off	Disk power off
3 (green)	Disk activity	Blinking	Normal operation
4 (yellow)	Not used	Not used	NA
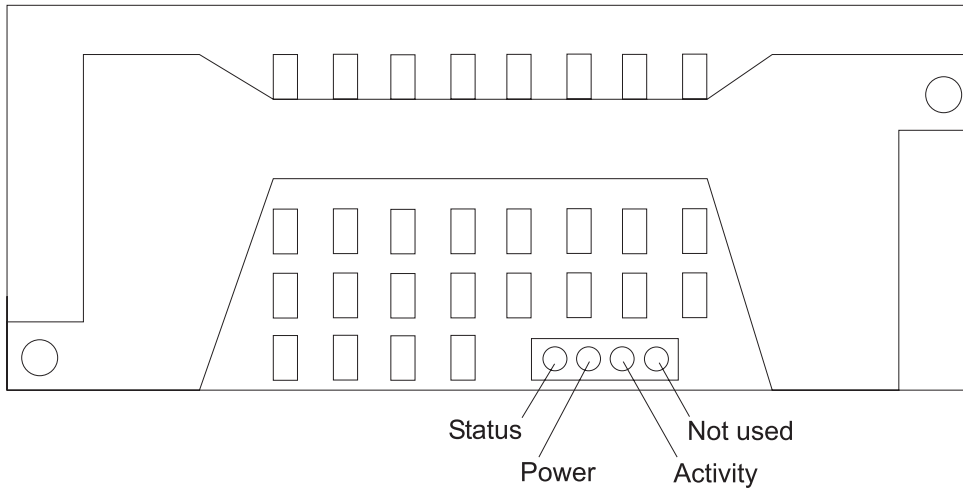
Figure 3-2. SCSI DASD LED locations

SCSI Enclosure Services (SES) hardware includes the DASD docking card and the DASD controller in the SP Expansion I/O Unit.

The SCSI device identification service aid is available from the "Service Aid" menu when using system diagnostics. This service aid allows you to identify and choose a SCSI device mounted in an SP Expansion I/O Unit. The SCSI device identification service aid generates a menu listing all:

- SCSI devices
- Siblings attached to a SCSI device
- SCSI adapters and their ports
- SCSI devices attached to a port
- DASD marked for remove/insert/identify

Accessing SCSI device service aid menus

To access the SCSI device service aid menus:

1. From system diagnostics, open the Service Aid menu

2. Select the "Identify and Remove Resource" option

3. Open the "Resource Selection List"

4. Highlight the SESx (DASD controller) you are interested in

5. Press **F7** (Commit)

   - The "SCSI Devices and SES Action Selection" dialog box opens

6. Select the SCSI drive you are interested in and press "Enter"

   - Select "Set Device for Identify, Removal, Insert, Normal"

     - "Identify" causes disk status (yellow) LED to blink

     - "Removal" **must** be selected before disk is physically removed

     - "Insert" **must** be selected before disk is installed

     - "Normal" **must** be selected after disk has been installed

Draining the NVRAM

Use the following procedure to drain the NVRAM (for example, when an E1DC firmware checkpoint occurs).

1. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to power down the node.
2. Locate the J13 jumper (see Figure 2-11 on page 2-13).
3. Move the jumper from the Charge position to the Discharge position.
4. Wait several minutes, then return the jumper to the Charge position.
5. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to power up the node.

Memory test hang problem

General memory information

Memory cards can be installed in either slot (or both) on the system planar, there is no requirement that one be installed before the other.

It is perfectly acceptable for there to be 2 partially populated memory cards, the first one does not have to be fully populated before memory on the 2nd memory card is usable.

Memory card memory modules, on the other hand, must be installed in matched (size and speed) pairs (refer to "Removing a memory card" on page 4-7 and "Replacing a memory card" on page 4-8). However, do not replace the covers as directed while troubleshooting this problem. A single memory module pair may be installed in module slots 1 and 2 (not slots 1 and 3). A second memory module pair could be installed in module slots 5 and 6 (slots 3 and 4 do not have to be populated first). Along these same lines, there is no requirement that memory module slots 1 and 2 be populated before another slot pair.

Problem resolution steps

This section attempts to trouble shoot a problem during the memory testing where the system hangs before an error code can be displayed on the LCD display.

1. Power down the system.
2. Remove and re-install any installed memory card(s), power the system up. If the system no longer stops at an E3xx code, re-seating the memory card(s) has corrected the problem.
3. Attempt to isolate the problem to a specific memory card.
   a. If there is only one memory card installed, tag the card as suspect bad and skip to step 4.
   b. Remove one of the two memory cards, tag the card as suspect bad and Power the system up. If the system no longer stops at an E3xx code, skip to step 3d.
   c. Power down the system, remove the installed memory card and install the memory card removed in step 3b. Move the suspect bad tag from the installed memory card to the one just removed, and power the system up. If the system stops at an E3xx code, remove the suspect bad tag and skip to step 7 on page 3-25, if the system does not stop at an E3xx code, skip to step 4.
   d. Power down the system, remove the installed memory card and install the memory card removed in step 3b (tagged as suspect bad). Power the system up. If the system stops at an E3xx code again, skip to step 4.
   e. Remove the suspect bad tag, re-install the second memory card and power the system up. If the system no longer stops at an E3xx code, re-seating the memory cards (again) has corrected the problem. If the system stops at an E3xx code again, skip to step 7 on page 3-25.
4. Attempt to isolate the problem to a specific memory module pair on the memory card tagged as suspect bad:
   a. Power the system down.
   b. Remove all installed memory modules from the suspect bad Memory card except one pair. Record the original positions of any memory modules removed so that when instructed to re-install them they can be installed in their original position.
   c. Power the system up.
   d. If the system no longer stops at an E3xx code, skip to step 4g.
   e. Replace the memory module pair left installed in step 4b, and tag the removed memory module pair as suspect bad.
   f. Power the system up. If the system stops at an E3xx code, skip to step 6 on page 3-25.
   g. Power down the system.
   h. If there are more memory module pairs to be re-installed on the suspect bad memory card, install another memory module pair in their original positions on the memory card, and continue with step 4i.

   If there are no more memory module pairs to be re-installed, you either have a suspect bad memory module pair or simply reseating the memory modules on the memory card has corrected the problem. If you have a suspect bad memory module pair, continue with step 5.
   i. Power the system up.
   j. If the system does not stop at an E3xx code, continue at step 4g.
   k. If the system has stopped at an E3xx code again, replace the memory module pair that was just re-installed and tag the removed memory module pair as suspect bad.
   l. Power the system up. If the system again stops at an E3xx code, continue with step 6 on page 3-25. If the system does not stop at an E3xx code, continue with step 4g.
5. Determine which of the suspect bad memory modules is defective (may be both).

   For each of the 2 memory modules tagged as suspect bad:
   a. Power the system down. Removing the currently installed memory module first, re-install one of the 2 suspect bad memory modules in its original position.
   b. Power the system up. If the system again stops at an E3xx code, the memory module tagged suspect bad just installed is defective, replace it with the memory module removed in step 5a. If

the system did not stop at an E3xx code, remove the suspect bad tag from the memory module just installed - it is not defective.

6. Replace the memory card.
7. Replace the system planar.
8. Replace the processor card(s).

E1xx code boot problems

Depending on the boot device, a checkpoint may be displayed on the LCD display for an extended period of time while the boot image is retrieved from the device. This is particularly true for Network boot attempts. If the checkpoint is displayed for an extended time there may be a problem loading the boot image from the device.

For network boot attempts, if the system is not connected to an active network or if the target server is inaccessible (this can also result from incorrect IP parameters being supplied), the system still attempts to boot and because time-out durations are necessarily long to accommodate retries, the system may appear to be hung.

1. Restart the system and get to the Firmware SMS menu. In the multi-boot menu check:
   - Is the intended boot device correctly specified in the boot sequence?
   - For network boot attempts:
     – Are the IP parameters correct?
     – Attempt to "Ping" the target server using the SMS "Ping" utility.
2. If the checkpoint E105 or E15B is displayed for an extended time, there may be a problem with the integrity of the boot image.
   - Try to boot and run stand-alone diagnostics against the system from an Ethernet adapter, using network boot, particularly against the intended boot device. If the diagnostics are successful, it may be necessary to perform an operating system specific recovery process, or reinstall the operating system. If you were unsuccessful trying to netboot, go to step 4.
3. If attempting to boot from a Hard disk:
   a. Verify proper SCSI bus termination.
   b. Check SCSI cable.
   c. It is possible that another attached SCSI device is causing the problem.

      Disconnect any other SCSI devices attached to the same controller as the one the boot device is attached to and retry the boot operation. If this is successful, one of the devices removed is causing the problem, re-attach devices one by one and retry the boot operation until the problem recurs and replace the device that caused the problem.
   d. It is possible that another installed adapter is causing the problem.

      Remove all installed adapters except the one the boot device is attached to, try to boot the stand-alone diagnostics from an Ethernet adapter, using network boot, and run the diagnostics against the system.

      If this is successful, re-install adapters (and attached devices as applicable) that were removed, one at a time, and run the stand-alone diagnostics against the system.
   e. Replace SCSI adapter (if drive is attached to a card rather than the I/O planar).
   f. Replace SCSI terminator (for isolation purposes).
   g. Replace I/O planar.
   h. Replace SCSI drive.
   i. Replace SCSI cable.
4. If attempting to boot from a Network controller:
   a. Power Off then On and retry the boot operation.
   b. Verify the network connection (network could be down).
   c. Verify that IP parameters are correct.

d. Try to "Ping" the target server.
   e. Have network administrator verify the server configuration for this client.
   f. Check network cable.
   g. Replace network adapter (unless trying to boot using the Ethernet controller on the I/O planar).
   h. It is possible that another installed adapter is causing the problem.

   Remove all installed adapters except the one you are trying to boot, and try to boot the online diagnostics from the hard disk drive. If this is successful, run the diagnostics against the system, particularly against the target network boot controller/adapter.

   If this is successful, re-install adapters (and attached devices as applicable) that were removed, one at a time, and run the diagnostics against the system. If the diagnostics fails, replace the last installed FRU.
   i. Replace I/O planar (if not replaced in previous step).
   j. Replace network cable.
5. If you replaced the indicated FRUs and the problem is still not corrected, or the above descriptions did not address your particular situation, go to "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.

Firmware utilities

The firmware utilities make it possible for you to view information about your computer and to perform such tasks as setting passwords and changing device configurations.

Text-based System Management Services

The text-based Open Firmware command line allows you to configure some adapters, and the System Management Services makes it possible for you to view information about your processor node and to perform such tasks as setting passwords and changing device configurations.

To start the text-based System Management Services, press **1** on the open TTY window, when the words "memory" and "keyboard" appear during startup.

After the text-based System Management Services starts, the following screen appears.

```
 RS/6000 Firmware
 Version daNI99046
 (c) Copyright IBM Corp. 1997  All rights reserved.
 -------------------------------------------------------
 Utilities

  1.  Password Utilities
  2.  Display Error Log
  3.  Remote Initial Program Load Setup
  4.  SCSI Utilities
  5.  Update Service Processor Firmware
  6.  Update System Firmware
  7.  Select Console                               .------.
  8.  Multiboot                                    |X=Exit|
  9.  Select Language                              '------'


 ===>
```

See the following for option descriptions:

- "Password utilities" on page 3-27

- "Display error log" on page 3-27
- "Remote initial program load setup" on page 3-28
- "SCSI utilities" on page 3-31
- "Update service processor firmware" on page 3-31
- "Update system firmware" on page 3-31
- "Select console" on page 3-31
- "MultiBoot" on page 3-31
- "Select language" on page 3-33

After you have finished using the text-based System Management Services, enter **x** (exit) to boot your system.

Password utilities: Entering this selection permits access to the following options.

```
RS/6000 Firmware
Version daNI99046
(c) Copyright IBM Corp. 1997  All rights reserved.
--------------------------------------------------------------------------
Password Utilities

 1.  Set Privileged-Access Password
 2.  Remove Privileged-Access Password
 3.  Unattended Start Mode <OFF>




                                            .------.
                                            |X=Exit|
                                            '------'
 ===>
```

Set privileged-access password: The privileged-access password protects against the unauthorized starting of the system programs.

Remove privileged-access password: If you previously had set a privileged-access password and want to remove it, select this option.

Note: If you *forget* the power-on password, contact your service representative.

Unattended start mode: This option is not supported on this node.

Display error log: A screen similar to the following is displayed when you select this option. Here, you can view or clear your computer's error log.

```
.------------------------------------------------------------.
|                    Error Log                               |
|                                                            |
|         Date       Time      ErrorCode     Location        |
|  Entry 1. 96/04/01  12:13:22  25A80011      00-00          |
|  Entry 2. no error logged                                  |
'------------------------------------------------------------'




  .------------------.                        .------.
  |C=Clear Error Log|                        |X=Exit|
  '------------------'                        '------'
```

Remote initial program load setup: This option allows you to enable and set up the remote startup capability of your computer. First, you are asked to specify the network parameters.

```
Network Parameters

  1. IP Parameters
  2. Adapter Parameters
  3. Ping




                                          .------.
                                          |X=Exit|
                                          '------'

  ===>
```

Note: Some applications may require that IP addresses contain leading zeroes for numbers less than 100. For example, 129.132.4.20 may need to be entered as 123.132.004.020.

Selecting the IP Parameters option displays the following screen.

```
 _____
|                                                      |
|  IP Parameters                                       |
|                                                      |
|   1. Client IP Address    000.000.000.000            |
|   2. Server IP Address    000.000.000.000            |
|   3. Gateway IP Address   000.000.000.000            |
|   4. Subnet Mask          000.000.000.000            |
|                                                      |
|                                                      |
|                                                      |
|                                                      |
|                                                      |
|                                       .------.       |
|                                       |X=Exit|       |
|                                       '------'       |
|                                                      |
|                                                      |
|   ===>                                               |
|                                                      |
|_____|
```

Selecting the Adapter Parameters option allows you to view an adapter's hardware address as well as configure network adapters that require setup.

```
 _____
|                                                      |
|  Adapter Parameters                                  |
|                                                      |
|      Device             HW Address                   |
|                                                      |
|   1. 3Com,3C905          80005AFC67BD                 |
|   2. Token-Ring          800032E54A12                 |
|                                                      |
|                                                      |
|                                                      |
|                                                      |
|                                       .------.       |
|                                       |X=Exit|       |
|                                       '------'       |
|                                                      |
|                                                      |
|_____|
```

Selecting option 1 (3Com,3C905) displays the following 100Mb Ethernet configuration menus:

```
 _____
|                                                      |
|  3Com Etherlink Fast XL                              |
|                                                      |
|                                                      |
|   1. Media Type         [Auto]                       |
|   2. Full Duplex        [Auto]                       |
|                                                      |
|                                                      |
|                                                      |
|                                       .------.       |
|                                       |X=Exit|       |
|                                       '------'       |
|                                                      |
|                                                      |
|_____|
```

Selecting the Media Type option allows you the change the media employed by the Ethernet adapter:

```
           .---------------.
           | MEDIA TYPE    |
           | 1. 10 BaseT   |
           | 2. 100 Base TX|
           | 3. Auto       |
           '---------------'
```
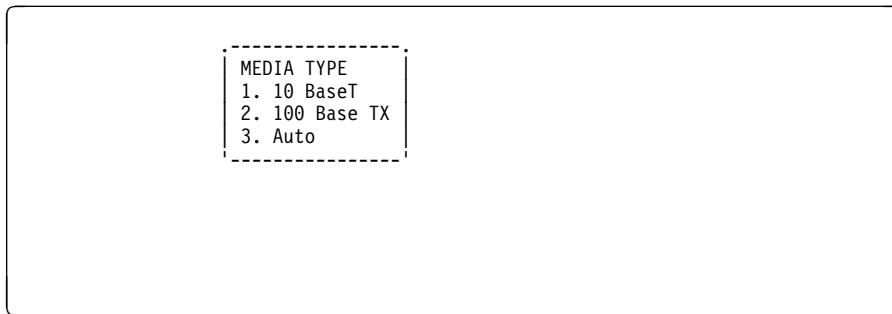
Selecting the Full Duplex option allows you to change how the Ethernet adapter communicates with the network:

```
           .---------------.
           | Full Duplex   |
           | 1. Yes        |
           | 2. No         |
           | 3. Auto       |
           '---------------'
```
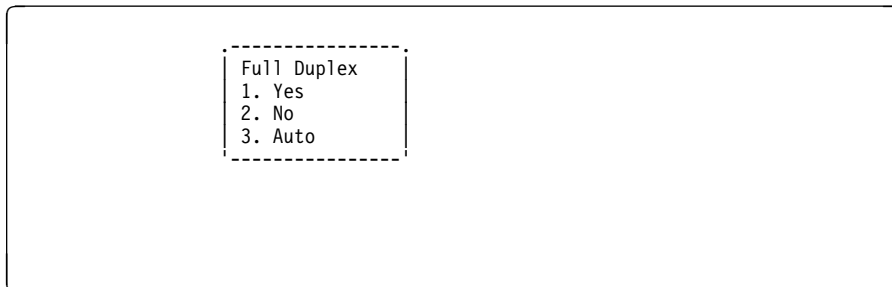
Ping, the last option available from the Network Parameters menu, allows you to test a connection to a remote processor node. After selecting the Ping option, you must choose which adapter communicates with the remote system.

```
   Interface

    1. Ethernet (Integrated)
    2. Token Ring (Slot=3)




   ===>
```
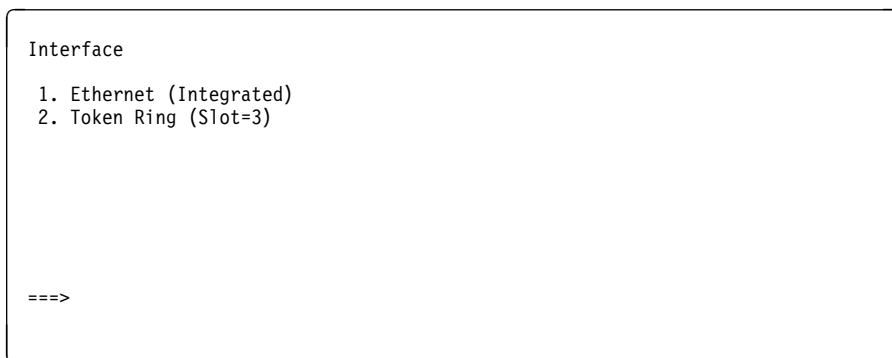
After choosing which adapter to use to ping the remote system, you must provide the addresses needed to communicate with the remote system.

```
Ping

 1. Client IP Address    129.132.4.20
 2. Server IP Address    129.132.4.10
 3. Gateway IP Address   129.132.4.30
 4. Subnet Mask          255.255.255.0




     .----------.                              .------.
     ³E=Execute³                              ³X=Exit³
     '----------'                              '------'

===>
```

SCSI utilities: This option allows you to view and change the addresses of the SCSI controllers attached to you computer.

Update service processor firmware: This menu option will not operate on this node because no diskette is available. If you need to update the SP Flash EPROM, use the procedure in "Service processor flash EPROM updates (and system firmware)" on page 3-48.

Update system firmware: This option allows you to update your system firmware. The firmware update image must already be present on the hard drive in order to perform this procedure.

Firmware recovery

If a troubleshooting procedure has indicated that the firmware information in your processor node has been corrupted, then you must perform a firmware recovery.

To perform a firmware recovery, do the following:

 1. Make sure the firmware image (*.img) is present on the hard drive in a known directory.

 2. Make sure the processor node power is turned off.

 3. Turn the processor node power on.

 4. When the keyboard indicator appears, press the **1** key on the system console ASCII terminal.

 5. When the System Management Services appear, choose Utilities and perform a System Firmware Update.

 6. Follow the on-screen instructions, specifying the directory and filename of the firmware image file.

Select console: Selecting this option allows you to define which display is used by the system for system management.

If no console is selected within two minutes, the console defaults to Serial Port 2.

MultiBoot: The MultiBoot Menu is option 2 on the System Management Services menu. A screen similar to the following is displayed.

```
Multiboot Menu

  1. Select Software
  2. Software Default
  3. Select Install Devices
  4. Select Boot Devices
  5. OK Prompt
  6. Mulitboot Startup <OFF> (or <ON>)



                                         .------.
                                         |X=Exit|
                                         '------'

  ===>
```

Select software: This option, if supported by the operating system, shows the names of the operating system installed. This option may not be supported by all operating systems.

In the case of AIX this is a supported option, if you receive a message saying that:

`No Operating System Installed`

this would mean that information in non-volatile storage could have been lost, as would happen if the battery had been removed. In order to recreate this value issue the bootlist command under AIX with the appropriate parameters as to the location of the operating system in a particular Hard disk. Please see the explanation of the bootlist command in your AIX documentation.

Software default: This option, if supported by the operating system, lets you select the default operating system to start the system. This option may not be supported by all operating systems.

Select install devices: This option produces a list of devices, for example the CD-ROM, where the operating system is installed from. You select one of the devices and the system searches the device for an operating system to install and if supported by the operating system in that device, the name of the operating system displays.

Select boot devices: This selection enables you to view and change the custom boot list, which is the sequence of devices read at startup time. A screen similar to the following is displayed.

```
Select Boot Devices

  1. Display Current Settings
  2. Restore Default Settings
  3. Configure 1st Boot Device
  4. Configure 2nd Boot Device
  5. Configure 3rd Boot Device
  6. Configure 4th Boot Device
  7. Configure 5th Boot Device



                                         .------.
                                         |X=Exit|
                                         '------'

  ====>
```

Selecting the Display Current Settings option lists the current order of devices in the boot list. The following screen shows an example of this display. For Ethernet boot, go to the Install From icon and then select Ethernet as a boot device.

```
Current Boot Sequence

 1. Diskette
 2. Ethernet (Integrated)
 3. SCSI CD-ROM           id=3   (slot=1)
 4. SCSI 500MB Hard Disk  id=6   (slot=1)
 5. SCSI 500MB Hard Disk  id=5   (slot=5)




                                      .------.
                                      |X=Exit|
                                      '------'


 ===>
```

Selecting any of the Configure Boot Device options displays the following screen.

```
     Configure Nth Boot Device

     Device Number        Current Position         Device Name

          1                     1                  Diskette
          2                     2                  Ethernet
          3                     3                  SCSI CD-ROM
          4                     4                  SCSI 4.5GB Hard Disk
          5                     -


     .-----------. .-----------.               .------.
     |P=prev-page| |N=next-page|               |X=Exit|
     '-----------' '-----------'               '------'
 ===>
```

OK prompt: This option provides access to the Open Firmware command prompt. The Open Firmware command prompt is used for debug purposes, and device driver development. Information about the commands are available in the IEEE Standard 1275.

Multiboot start: This option toggles between OFF and ON and selects if the Multiboot menu invokes automatically on startup or not. This option should be kept in the OFF state.

Select language: This option (option 4 on the System Management Services menu) allows you to change the language used by the text-based System Management Services screens. A screen similar to the following is displayed.

```
 _____
|                                                            |
|   SELECT LANGUAGE                                          |
|                                                            |
|     1.  English                                           |
|     2.  Francais                                          |
|     3.  Deutsch                                           |
|     4.  Italiano                                          |
|     5.  Espanol                                           |
|     6.  Svenska                                           |
|                                                            |
|                                                            |
|   ====>                              .------.              |
|                                      |x=Exit|              |
|                                      '------'              |
|                                                            |
|_____|
```

Note: Your ASCII terminal must support the ISO-8859 character set in order to properly display languages other than English.

Open firmware command prompt

To enter the Open Firmware command line, you must press the **F8** key or number **8** key *after the keyboard icon appears* during startup.

If you have pressed the **F8** key or number 8 key, the Open Firmware command line (an "OK" prompt) appears after the initialization and power-on self test (POST) are complete.

The OK Prompt provides access to the Open Firmware command prompt. The Open Firmware command prompt is used for debug purposes, and device driver development. Information about the commands that are available in the IEEE Standard 1275.

The Open Firmware command line is used to set up adapters that cannot be configured with the System Management Services. Your adapter documentation directs you to use this option if it is needed.

To exit from the Open Firmware command enter `reset-all` or power the system down and reboot.

To start the text-based System Management Services instead of the Open Firmware command line, press **press 1** on the console when the keyboard text symbol appears during startup.

Service processor menus

The service processor menus enable you to configure service processor options and to enable and disable functions.

Service processor menus are available using an open TTY window from the control workstation when the node is logically powered off and the service processor is operating with standby power. Service processor menus are also available when server power is on and the service processor has detected a server problem (such as loss of surveillance).

During the first power up (i.e. node circuit breaker is powered on), service processor menus are not available for 45 seconds while the service processor is running self-tests and initializing the server. If the server powers down, service processor menus become available after 15 seconds.

For a summary of the service processor functions and the methods for invoking them, see Table 3-3 on page 3-35.

Table 3-3. Service processor functions			
Service Processor Functions	**Service Processor Menus (ASCII terminals)**	**Service Processor Service Aids (ASCII or graphics terminals)**	**SMS (ASCII or graphics terminals)**
Read VPD	Y[3]		Y[3]
View System Environmental Conditions	Y[3]		
Read System POST Errors	Y[3]		
Read SP Error Logs	Y[3]		
View Progress Indicators from last Boot	Y[3]		
Power-on System	Y[3]		
Power-off System	Y[2]		
Read NVRAM	Y[2]		
Reset SP	Y[2]		
Setup Reboot/Restart Policy	Y[2]		
Start Talk Mode	N		
Enable/Disable Console Mirroring	N	Y[1]	
Select Serial Port Speed	N	Y[1]	
Enable/Disable Modem	N	Y[1]	
Setup Modem Configuration	N	Y[1]	
Setup Ring Indicate Power-On	N	Y[1]	
Telephone Number Setup	N	Y[1]	
OS Setup Surveillance	Y[2]	Y[1]	
Reprogram SP Flash EPROM	N	Y[1]	Y[2]
Change General Access Password	Y[2]		Y[2]
Change Privileged Access Password	Y[2]		Y[2]
Select Language	Y[2]		Y[2]
Enable/Disable Unattended Start Mode	Y[2]		Y[2]

Note:

[1] Operating system root password
[2] Privileged access password
[3] General access (power-on) password

Service processor menus

The service processor menus are divided into two groups:

- General user menus - the user must know the general access password.

- Privileged user menus - the user must know the privileged access password.

The following section describes these two groups of menus, how to access them, and the functions associated with each option.

When the server is powered down, the service processor menus may be accessed locally or remotely. menus for maintenance functions, you must use

Menu inactivity: To prevent loss of control in unstable power environments, the service processor leaves the menu mode after 5 minutes of inactivity. Menus may be resumed by pressing any key on the terminal, local or remote.

How to access service processor menus locally: Service processor menus may be accessed locally on the control workstation by pressing a key from an open TTY window from Perspectives on the control workstation.

How to access service processor menus remotely: This function is not supported on this node.

Service processor menus may be accessed remotely by connecting a modem to serial port 1 or serial port 2.

- Power off the server, unplug the power cord, and press the power button to drain capacitance while power is disconnected.
- Connect the modem to the appropriate serial port and turn the modem on.
- Plug in the server.

General user menus

The menu options presented to the General user are a subset of the options available to the Privileged user. The user must know the General Access Password in order to access these menus.

```
          GENERAL USER MENU

   1. Power-On System

   2. Read VPD Image from Last System Boot

   3. Read Progress Indicators from Last System Boot

   4. Read Service Processor Error Logs

   5. Read System POST Errors

   6. View System Environmental Conditions

  99. Exit from Menus

   1>
```

Power-on System: Allows the user to power-on the system.

Read VPD Image from Last System Boot: Displays manufacturer vital product data, such as serial numbers, part numbers, etc. from last system boot.

Read Progress Indicators from Last System Boot: Displays up to 80 boot progress indicators (check points) from the last system boot. This historical information may be useful to help diagnose system faults.

Read Service Processor Error Logs: Displays the service processor error logs.

```
      Read Service Processor Error Logs:

                   Error Log

 19990809181824  1. 40210011 A stopped redundant fan detected.
 U0.0-F5

    Press "C" to clear error log, any other key to continue.
```

The time stamp in this error log is Coordinated Universal Time (CUT), a.k.a. Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp with local time.

Read System POST Errors: Selecting this item lets you review the results of the POST (Power-On Self Test). Your server may be able to start in the presence of POST errors if there is sufficient working system resources. If POST errors occur during startup, this error log when used with the diagnostics helps to isolate faults.

View System Environmental Conditions: On selection of this menu, the service processor reads all environmental sensors and reports the results to the user. This option maybe useful when surveillance fails, as it allows the user to determine the environmental conditions that may be related to the failure.

Privileged user menus

The following menus are available to privileged users only. The user must know the Privileged Access Password in order to access these menus.

MAIN MENU: At the top of the MAIN MENU is a listing containing:

- Your Service Processor's current firmware version
- The firmware copyright notice
- The System Name given to your server during setup

You need the firmware version for reference when you either update or repair the functions of your service processor.

The System Name, an optional field, is the name your server reports in problem messages. This name helps your support team, (for example, your system administrator, network administrator, or service representative) to more quickly identify the location, configuration, and history of your server. The System Name is set from the Main Menu using option 6.

Note: The information under the Service Processor Firmware heading in the Main Menu example that follows is example information only.

```
               Service Processor Firmware
               Firmware Level: xxxxxxxx
               Copyright 1998, IBM Corporation


          MAIN MENU

   1. Service Processor Setup Menu

   2. System Power Control Menu

   3. System Information Menu

   4. Language Selection Menu

   5. Call-In/Call-Out Setup Menu
      (Not supported)

   6. Set System Name


  99. Exit from Menus
 1>
```

See the following for option descriptions:

- "Service Processor Setup Menu"
- "System Power Control Menu" on page 3-40
- System Information Menu ("System Information Menu" on page 3-42)
- "Language Selection Menu" on page 3-43
- "Call-In/Call-Out Setup Menu" on page 3-44
- "Set System Name" on page 3-44

Service Processor Setup Menu

```
          SERVICE PROCESSOR SETUP MENU

   1. Change Privileged Access Password
   2. Change General Access Password
   3. Enable/Disable Console Mirroring:
      Currently Disabled
      (Not supported)
   4. Start Talk Mode
      (Not supported)
   5. OS Surveillance Setup Menu
   6. Reset Service Processor
   7. Reprogram Service Processor Flash EPROM
      (Not supported)
  98. Return to Previous Menu
  99. Exit from Menus

   1>
```

> **Note**
>
> Unless otherwise stated in menu responses settings become effective when a menu is exited using option 98 or 99.

Passwords: Passwords can be any combination of up to 8 alphanumeric characters. You can enter longer passwords, but the entries are truncated to include only the first 8 characters. Passwords can be set from the service processor menu or from the SMS menus.

The following illustrates what you can access with the Privileged Access Password and the General Access Password.

Privileged Access Password	General Access Password	Resulting Menu
None	None	MAIN MENU displayed
None	Set	MAIN MENU displayed
Set	None	User's with password see the MAIN MENU Others users see the GENERAL USER MENU
Set	Set	Users see menus associated with the entered password

Change Privileged Access Password: Set or change the Privileged Access Password. It provides the user with the capability to access all service processor functions. This password is usually used by the system administrator or **root** user.

Change General Access Password: Set or change the General Access Password. It provides limited access to service processor menus, and is usually available to all users who are allowed to power-on the server.

Enable/Disable Console Mirroring: This option is not supported on this node.

Start Talk Mode: In a console mirroring session, it is useful for those that are monitoring the session to be able to communicate with each other. Selecting this menu item activates the keyboards and displays for such communications while console mirroring is established. This is a full duplex link, so message interference is possible. Alternating messages between users works best.

Surveillance Setup Menu: This option may be used to setup operating system surveillance.

```
        OS Surveillance Setup Menu

  1. Surveillance:
       Currently Disabled

  2. Surveillance Time Interval:
       Not Applicable

  3. Surveillance Delay:
       Not Applicable


 98. Return to Previous Menu

 1>
```

- **Surveillance**

  May be set to Enable or Disable.

- **Surveillance Time Interval**

  May be set to any number from 2 to 255.

- **Surveillance Delay**

  May be set to any number from 0 to 255.

Refer to "Service processor system monitoring - surveillance" on page 3-47 for more information about surveillance.

Reset Service Processor: Allows the user to reinitialize the service processor.

Reprogram Service Processor Flash EPROM: An update diskette can be acquired from the Support page on the Internet or from your service team. The Internet address is:

`http://www.rs6000.ibm.com/support/micro`

This menu option will not operate on this node because no diskette drive is available. If you need to update system firmware, use the procedure in "Service processor flash EPROM updates (and system firmware)" on page 3-48.

System Power Control Menu

```
        SYSTEM POWER CONTROL MENU

  1. Enable/Disable Unattended Start Mode:
     Currently Disabled

  2. Ring Indicate Power-On Menu
     (Not supported)
  3. Reboot/Restart Policy Setup Menu
  4. Power-On System
  5. Power-Off System
  6. Enable/Disable Fast System Boot:
     Currently Enabled

  7. Boot Mode Menu
 98. Return to Previous Menu
 99. Exit from Menus

 1>
```

Enable/Disable Unattended Start Mode: This option may be used to instruct the service processor to immediately power-on the server after a power failure, bypassing power-on password verification.

Note: This option is not supported on this node.

Reboot/Restart Policy Setup Menu

```
        Reboot/Restart Policy Setup Menu

  1.  Number of reboot attempts:
      Currently  1

  2.  Use OS-Defined restart policy?
      Currently  No

  3.  Enable supplemental restart policy?
      Currently  Yes

  4.  Call-Out before restart:
      Currently Disabled
      (Not supported)

 98.  Return to Previous Menu

 1>
```

Number of reboot attempts: If the server fails to successfully complete the boot process, it attempts to reboot the number of times specified. Entry values equal to or greater than 0 are valid. Only successive failed reboots attempts count, not reboots that occur after a restart attempt. At restart, the counter is set to 0.

Use OS-Defined restart policy: Lets the service processor react or not react the same as the operating system to major system faults, by reading the setting of the operating system parameter **Automatically Restart/Reboot After a System Crash**. This parameter may, or may not be defined depending on the operating system or its version/level. If the operating system automatic restart setting is defined, then it

may be set to respond to a major fault by restarting or by not restarting. See your operating system documentation for details on setting up operating systems automatic restarts. The default value is YES.

Enable supplemental restart policy: The default setting is NO. If set to YES, the service processor restarts the system when the system loses control as detected by service processor surveillance, and either:

1. The **Use OS-Defined restart policy** is set to NO OR

2. The **Use OS-Defined restart policy** is set to YES and the operating system has NO automatic restart policy.

    Refer to "Service processor reboot/restart recovery" on page 3-46.

Call-Out before restart (enabled/disabled): If a restart is necessary due to a system fault, you can enable the service processor to call out and report the event. This item is valuable if the number of these events becomes excessive, signalling a bigger problem.

Power-On System: Lets you power-on the system immediately. For other power-on methods see "Node power-on methods" on page 3-45.

Power-Off System: Allows the user to power-off the server following a surveillance failure.

Enable/Disable Fast System Boot: In fast boot mode, there are two actions that will explicitly change the mode back to slow boot: 1) All checkstop conditions and 2) The user manually changing mode using the menu.

Clearing NVRAM also returns the mode to slow boot mode, slow boot remains in effect until the system boots AIX successfully one time, then automatically changes to fast boot.

System Information Menu

```
        SYSTEM INFORMATION MENU

    1. Read VPD Image from Last System Boot
    2. Read Progress Indicators from Last System Boot
    3. Read Service Processor Error Logs
    4. Read System POST Errors
    5. Read NVRAM
    6. Read Service Processor Configuration
    7. View System Environmental Conditions
    8. Processor Configuration/Deconfiguration Menu
    9. Memory Configuration/Deconfiguration Menu
    10. Enable/Disable CPU Guard     (Currently Enabled)
    11. Enable/Disable MEM Guard     (Currently Enabled)
    98. Return to Previous Menu
    99. Exit from Menus

  1>
```

Read VPD Image from Last System Boot: Displays the VPD information that was in effect after the last system boot. This information will usually be identical with the results from the menu selection "Read VPD," but in the case of configuration updates or certain faults, this historical comparison can be useful to System Administrators and service personnel.

Read Progress Indicator From Last System Boot: Displays the boot progress indicators (check points), up to a maximum of 80, from the last system boot. This historical information may be useful to help diagnose system faults.

Read Service Processor Error Logs: Displays error conditions detected by the Service Processor.

```
                  Error Log

 19990809181824  1. 40210011 A stopped redundant fan detected.
 U0.0-F5

    Press "C" to clear error log, any other key to continue.

```

The time stamp in this error log is Coordinated Universal Time (CUT), a.k.a. Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp with local time.

Read System POST Errors: Selecting this item lets you review the results of the POST (Power-On Self Test). Your server may be able to start in the presence of POST errors if there is sufficient working system resources. If POST errors occur during startup, this error log when used with the diagnostics helps to isolate faults.

Read NVRAM: Displays Non-Volatile Random Access Memory (NVRAM) content.

Read Service Processor Configurations: Displays the processor configurations.

View System Environmental Conditions: The service processor reads all environmental sensors and reports the results to the user. This option is most useful when surveillance fails, as it allows the user to determine the environmental conditions that may be related to the failure.

The content of the System Environmental Conditions menu varies depending on the node examined and the level of service processor firmware installed.

Processor Configuration/Deconfiguration Menu: Use this option only in conjunction with support center instruction. See "Processor boot-time deconfiguration" on page 3-51.

Memory Configuration/Deconfiguration Menu: Use this option only in conjunction with support center instruction. See "Memory boot-time deconfiguration" on page 3-53.

Enable/Disable CPU Guard: Use this option only in conjunction with support center instruction.

Enable/Disable MEM Guard: Use this option only in conjunction with support center instruction.

Language Selection Menu

```
        LANGUAGE SELECTION MENU

    1. English

    2. Francais

    3. Deutsch

    4. Italiano

    5. Espanol

    6. Svenska

   98. Return to Previous Menu

   99. Exit from Menus
```

Note: Your ASCII terminal must support the ISO-8859 character set in order to properly display languages other than English.

This menu allows selecting languages into which service processor and system firmware menus and messages are displayed.

Call-In/Call-Out Setup Menu: **All functions specific to this menu are not supported on this node.**

Set System Name

Service processor functions

The POWER3 SMP nodes service processor supports the following functions:

Built-in functions	Initialization and Test	Service processor Basic Instructions Test (BIST)
		JTAG System Chip Initialization
	Error Data Collection	BIST/POST errors and status
		Checkstop FIR data logout
		Machine check logout
	Configuration	CPU Complex validation
		VPD Collection
	System Management	Reset and Reboot on System Firmware fail
		Reboot on system failure

Local User Function	User Interface	Local async console
		Text based menus with NLS
		Operator Panel messages
	Power and Miscellaneous	Power On/Off
		Configurable Reboot Policy
	Status and Data Access	VPD
		Error data (service processor)
		Error data (system)
		Environmental data
	service processor Setup Utilities	Passwords
		Phone numbers
		Language (NLS) selection
		Call In/Call Out enable/disable
		Flash (Gold/Recovery block) Update
		Flash (Composite block) Update
		System Name
		Modem Configuration
Remote User Functions **Note:** These functions are not supported.	Call Out (Call Home) Reporting	Boot failure
		OS Termination
		Surveillance failure
		Critical EPOW reporting
		Checkstop
		Machine check
	Identify system by name	Call In
		Power-on via ring-indicate
		Password/security check
		Console mirroring/Quick disconnect
Application Interface Functions	Monitor/Sense	Thermal/Voltage/fan speed
		service processor Flash Update (Recovery and Composite)

Node power-on methods

- Power-on from control workstation (CWS), refer to the *IBM Parallel System Support Programs for AIX: Administration Guide*, (GC23-3897).

- Service Processor Menu power-on request – not supported on this node

- Unattended start mode – not supported on this node

- Timed power-on - refer to the `shutdown -t` command on servers using AIX.

  Working in conjunction with AIX, the Service Processor in your server can operate a timer, much like the wake-up timer on your clock radio. You can set the timer so that your server powers on at a certain time after shutting down. The timer is battery operated, so power interruptions occurring while

the server is off do not affect its accuracy. Refer to the **shutdown -t** command of AIX for details on setting the timer.

Because of the potential for power loss, the Timed Power-On function of AIX can only be assured when Unattended Power-On Mode is enabled. If a Timed Power-On event occurs during a power loss, and if Unattended Power-On Mode is enabled, the system starts when power is restored.

If Unattended Start Mode is disabled (the default), the system power state remains off when power is restored, regardless of the power state of the system when power loss occurred.

- Ring Indicate Power-On

  Enabling ring indicate power-on disables remote call-in. If ring indicate power-on is enabled, the server will power on at a predetermined number of rings. If the server is already on, no action is taken. In either case, the telephone call is not answered. The caller receives no feedback that the server powered on.

- Follow-up to a Failed Boot Attempt

  The service processor will initiate a power-on sequence upon detection of a failed boot attempt.

Service processor reboot/restart recovery

Reboot describes bringing the system hardware back up from scratch, for example, from a system reset or power on. The boot process ends when control passes to the operating system process.

Restart describes activating the operating system after the system hardware reinitialized. Restart must follow a successful reboot.

Failure during boot process: During the boot process, either initially after system power-on or upon reboot after a system failure, the Service Processor monitors the boot progress (via surveillance). If progress stops, the service processor can reinitiate the boot process (reboot) if enabled to do so. service processor can re-attempt this process according to an entry on the Reboot/Restart Policy Setup Menu.

Failure during normal system operation: When the boot process completes and control transfers to the operating system (OS), the service processor can monitor operating system activity (see the SERVICE PROCESSOR SETUP MENU item Set Surveillance Parameters). If OS activity stops, the service processor can initiate a reboot/restart process based on the settings in the Service Processor Reboot/Restart Policy Setup Menu and the OS automatic restart settings (see OS documentation).

If the operating system is AIX, the menu item under SMIT for setting the restart policy is Automatically Reboot After Crash (True/False), and the default is False. When the setting is True, and if the service processor parameter, Use OS-Defined Restart Policy, is Yes (the default), service processor takes over for AIX to reboot/restart after a Check Stop or Surveillance failure.

Service processor reboot/restart policy controls: The operating system's automatic restart policy (see operating system documentation) indicates the OS response to a system crash. The service processor can be instructed to refer to that policy, or not, by the Use OS-Defined Restart Policy menu item.

If the operating system has no automatic restart policy, or if it is disabled, then the service processor restart policy can be controlled from the service processor Menus by using the Enable Supplemental Restart Policy selection.

Use OS-defined restart policy?:   The **Use OS-Defined restart policy** default setting is YES. This causes the service processor to refer to the OS Automatic Restart Policy setting and take action, the same action the OS would take if it could have responded to the problem causing the restart.

When this setting is NO, or if the OS did not set a policy, the service processor refers to Enable supplemental restart policy for its action.

Enable supplemental restart policy?:   The default setting is NO. If set to YES, the service processor restarts the system when the system loses control as detected by service processor surveillance, and either:

1. The **Use OS-Defined restart policy** is set to NO OR

2. The **Use OS-Defined restart policy** is set to YES and the operating system has NO automatic restart policy.

The following provides a more thorough understanding of the relations among the OS and service processor restart controls:

OS automatic reboot/restart after crash setting	Service processor to use OS-defined restart policy?	Service processor enable supplemental restart policy?	System response
None	No	No[1]	
None	No	Yes	Restarts
None	Yes[1]	No[1]	
None	Yes[1]	Yes	Restarts
False[2]	No	No[1]	
False[2]	No	Yes	Restarts
False[2]	Yes[1]	No[1]	
False[2]	Yes[1]	Yes	
True	No	No[1]	
True	No	Yes	Restarts
True	Yes[1]	No[1]	Restarts
True	Yes[1]	Yes	Restarts

Note:

   [1] Service processor default
   [2] AIX default

Service processor system monitoring - surveillance

Surveillance is a function in which the service processor monitors the system, and the system monitors the service processor. This monitoring is accomplished by periodic samplings called heartbeats.

Surveillance is available during two phases:

1. System firmware bringup (automatic) and

2. Operating system runtime (optional).

System firmware surveillance: Provides the service processor with a means to detect boot failures while the system firmware is running.

System firmware surveillance is automatically enabled during system power-on. It cannot be disabled via a user selectable option.

If the service processor detects no heartbeats during system IPL (for 10 minutes), it cycles the system power to attempt a reboot. The maximum number of retries is set from the service processor menus. If the fail condition repeats, the service processor leaves the machine powered on, logs an error and offers menus to the user. If Call-out is enabled, the service processor calls to report the failure and displays the operating system surveillance failure code on the operator panel.

Operating system surveillance: Provides the service processor with a means to detect hang conditions, hardware or software failures while the operating system is running. It also provides the operating system with a means to detect a service processor failure by the lack of a return heartbeat.

Operating system surveillance is not enabled by default. This is to allow the user to run operating systems that do not support this service processor option.

Operating system surveillance can be enabled and disabled via:

- Service Processor Menus
- Service Processor Service Aids

Three parameters must be set for operating system surveillance:

1. Surveillance enable/disable
2. Surveillance interval

   This is the maximum time the service processor should wait for a heartbeat from the operating system before timeout.
3. Surveillance delay

   This is the length of time to wait from when the operating system is started to when the first heartbeat is expected.

Surveillance will not take effect until the next time the operating system is started after setting the parameters.

If operating system surveillance is enabled (and system firmware has passed control to the operating system), and the service processor does not detect any heartbeats from the operating system, the service processor assumes the system is hung. The machine is left powered on and Service Processor enters standby phase, displaying the operating system surveillance failure code on the operator panel. If Call-out is enabled, the service processor calls to report the failure.

Service processor flash EPROM updates (and system firmware)

The service processor EPROM may need to be updated for two different reasons:

1. The UPDATE (composite) portion of the EPROM has become corrupted.
2. Service processor firmware upgrades, without any corruption present.

The use of a Flash EPROM allows updates to occur without physically replacing the memory.

Firmware updates: The firmware in your server can be updated using one of two available initiation processes:

1. SMS Utilities initiation

2. Diagnostic Service Aids initiation

Each initiation method is described below. In each case, the process prompts you for your authority and shows the contents of the update media. Verify the file with which to perform the update, and follow any other instructions that may appear. After initiation, the processes are identical and automatic.

There are two areas in each firmware module that may need updating:

1. The gold code or base code or EPROM area

2. The custom or main program or FLASH area

Each update file contains matching gold and custom firmware, so it is not possible to update to a conflicting set.

Before the update process begins, the versions of each of the two areas of the target firmware module are compared to the versions on the update file. Only the area(s) that need updating are updated. In most cases, only the custom area is updated.

An update file can be acquired from the Support page on the Internet or from your service team. The Internet address is:

`http://www.rs6000.ibm.com/support/micro`

The update files will need to be loaded onto the control workstation prior to distribution to the nodes. This can be done by putting the files on a diskette in TAR or DOS format, and then using the appropriate **tar** or **dosread** command at the control workstation. Alternatively, you might be able to FTP the files directly onto the control workstation.

Checking current firmware levels: If the node is running AIX or in Service Mode, you may check the current firmware level by performing the first step of the procedure in "Updating firmware from diagnostic service aids" on page 3-50. Otherwise, refer to the downloaded update instructions, the System Management Services, or Service Processor menus on page 3-37, to determine the level of the processor node or service processor flash.

Distributing firmware files to nodes before update

Note: This step must be done to propagate the firmware files on the hard drive of the node prior to initiating the firmware update.

1. Locate the required firmware file(s), which may be one or more of the following.

   `NIyyjjj.IMG` - image file used for system firmware
   `nhyymmdd.bin` - binary file used to burn the service processor EEPROM
   `nhyymmdd.img` - image file used for service processor flash update
   `nkyymmdd.img` - image file used for system firmware and service processor flash update
   (where: yy=year, jjj=julian date, mm=month, dd=day)

Notes:

    a. The first two or three letters of the filename will vary depending on the node type.

    b. Node types from 332 MHz and newer can update both system firmware and service processor code from one file. Refer to the applicable README file for details.

2. Transfer the firmware file(s) to the control workstation. The file can be put into any directory. You should create a firmware directory or using **/tmp** or **/var**.

3. Make sure each node that will be updated is IPLed.

4. From the control workstation or each node, use the **ftp** command to transfer the files to each node. Make sure to use "image" or "binary" mode to ensure that the files are exact duplicates. The file(s) may be put in any directory although a directory with the name **/tmp** or **/var** is suggested.

5. You may recheck that the distributed files are exact duplicates by running the following command against the original and distributed files:

    `chksum` *filename*

Updating firmware from the SMS utilities

Notes:

1. From the SMS menus, select "Utilities," then select option to "Update System Firmware" or "Update Service Processor."

2. Select update from filesystem. (Diskette is not supported)

3. Enter the directory and filename of the firmware file.

4. When firmware is completed, the system may reboot.

5. You should recheck the firmware level.

Note: The node must be powered-on to bring up the SMS Menus.

Updating firmware from diagnostic service aids

Note: This procedure can be run from Service Mode or from AIX diagnostics.

1. Check current level of firmware:

    a. From Service Mode, select "Task Selection (Service Aids)," then select "Display Hardware Vital Product Data," select "All Resources," then press the commit key. Continue at 1c below.

    b. From AIX, use **lscfg -pv | pg** to list VPD information. Continue at 1c below.

    c. Scan the output for the following (towards the bottom):

```
- System Firmware:
    ROM Level (alterable).......NIyyjjj

- Service Processor
    ...
    ROM Level (non-alterable)...nhyymmdd
    ROM Level (alterable).......nhyymmdd
```

2. If running from AIX, enter the **diag** command, then select "Task Selection (Service Aids)."

3. From the "TASK SELECTION LIST," select "Update System or Service Processor Flash" (near the bottom of the list).

4. Select "FILESYSTEM" (diskette not supported).

5. Enter the directory and filename of the firmware file.

6. When firmware is completed, the system may reboot.

7. You should recheck the firmware level.

Service processor error logs

The service processor error logs contain error conditions detected by the service processor.

```
                    Error Log

19990809181824   1. 40210011 A stopped redundant fan detected.
U0.0-F5

    Press "C" to clear error log, any other key to continue.
```

The time stamp in this error log is Coordinated Universal Time (CUT), a.k.a. Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp with local time.

System POST errors

If POST (Power-On Self Test) errors occur during startup, this error log help isolate faults when used with the diagnostics.

```
                        Read System POST Errors


Version : 0
Severity : 0
Disposition : 0
Initiator : 0
Event being reported : 0
Extended Error Log Data:
000000C2 00000000 00000084 00000009 00000000 00000000 00000000 00000000
00000020 00000000 00000000 00000000 00000000 00000000 00000072 00000074
00000063 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000028 00000003 00000000 00000000 00000005 00000000 00000001
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000049 00000042 0000004D 00000000 00000055 00000030 0000002E 00000031
0000002D 00000050 00000031 0000002D 00000058 00000031 00000000

                    (Press Return to Continue)
```

Processor boot-time deconfiguration

Processor (CPU) boot-time deconfiguration is a function, implemented in the firmware, for removing a CPU from the system configuration at system boot. This function identifies hardware resources (processor cards) that must be removed. They are identified by boot-time test failure or prior runtime recoverable or unrecoverable errors. Hardware built-in self test (BIST) and firmware power-on self test (POST) are used to find and isolate failing processor hardware during system boot. The error detection logic in the

processor is used to capture runtime recoverable and unrecoverable error indications. The firmware uses the error signatures in the hardware to analyze and isolate the error to a specific processor.

A processor that is deconfigured remains offline for subsequent reboots until the faulty processor card is replaced. The user can also manually deconfigure or re-enable a previously deconfigured processor or disable the function.

```
        SYSTEM INFORMATION MENU

   1. Read VPD Image from Last System Boot
   2. Read Progress Indicators from Last System Boot
   3. Read Service Processor Error Logs
   4. Read System POST Errors
   5. Read NVRAM
   6. Read Service Processor Configuration
   7. View System Environmental Conditions
   8. Processor Configuration/Deconfiguration Menu
   9. Memory Configuration/Deconfiguration Menu
   10. Enable/Disable CPU Guard     (Currently Enabled)
   11. Enable/Disable MEM Guard     (Currently Enabled)
   98. Return to Previous Menu
   99. Exit from Menus

   1>
```

Figure   3-3. System information menu, POWER3 SMP High Node example

```
        Processor Configuration/Deconfiguration Menu

ID NUM  CARD SLOT  MODULE  ERROR        STATUS
   4.       1         1    (0x 0) : Configured by system
   5.       1         2    (0x 0) : Configured by system
  12.       4         1    (0x 0) : Manually deconfigured
  13.       4         2    (0x 0) : Manually deconfigured
98. Return to Previous Menu

 Select the processor record number
 1>
```

Figure   3-4. Processor Configuration/Deconfiguration Menu

Note: The processor configuration/deconfiguration menu is not valid unless the system has been booted to progress code 'E0A1' once.

The processor numbers (the three digits on the left side of the display) are shown as, *x. y : z:*, where:

Digit	*x* (1st digit)	*y* (2nd digit)	*z* (3rd digit)
Component	Node Processor Number	Processor Card Slot	Processor Card CPU Number
Values	0-15	1-4	0-1

To change the processor configuration, select the **node processor number** (1st digit). The processor state changes from the configured to deconfigured (or deconfigured to configured) state.

Memory boot-time deconfiguration

Memory boot-time deconfiguration is a function, implemented in the firmware, for removing memory segments from the system configuration at system boot. This function identifies hardware resources (memory cards or DIMMs) that must be removed. They are identified by boot-time test failure or prior runtime recoverable or unrecoverable errors. Hardware built-in self test (BIST) and firmware power-on self test (POST) are used to find and isolate failing memory hardware during system boot. The error detection logic in the memory controller is used to capture runtime recoverable and unrecoverable error indications. The firmware uses the error signatures in the hardware to analyze and isolate the error to specific memory segments.

The memory segment that is deconfigured remains offline for subsequent reboots until the faulty memory component is replaced. The user can also manually deconfigure or re-enable a previously deconfigured memory segments or disable the function.

```
      SYSTEM INFORMATION MENU

 1. Read VPD Image from Last System Boot
 2. Read Progress Indicators from Last System Boot
 3. Read Service Processor Error Logs
 4. Read System POST Errors
 5. Read NVRAM
 6. Read Service Processor Configuration
 7. View System Environmental Conditions
 8. Processor Configuration/Deconfiguration Menu
 9. Memory Configuration/Deconfiguration Menu
10. Enable/Disable CPU Guard     (Currently Enabled)
11. Enable/Disable MEM Guard     (Currently Enabled)
98. Return to Previous Menu
99. Exit from Menus

 1>
```

Figure 3-5. System Information Menu, POWER3 SMP High Node example

```
   Memory Configuration/Deconfiguration Menu

CARD SLOT   GROUP      DIMM's IN GROUP              STATUS
    1         1    :  2   4 10 12 18 20 26 28  :  Configured by system
    1         2    :  6   8 14 16 22 24 30 32  :  Configured by system
    1         3    :  1   3  9 11 17 19 25 27  :  Configured by system
    1         4    :  5   7 13 15 21 23 29 31  :  Configured by system

    2         -    :          -                :  Not Available

    3         -    :          -                :  Not Available

    4         -    :          -                :  Not Available

98. Return to Previous Menu

Enter card number and group number separated by a space  1>
```

Figure 3-6. Memory Configuration/Deconfiguration Menu

Note: The memory configuration/deconfiguration menu is not valid unless the system has been booted to progress code 'E0A1' once.

To change the memory configuration, select the **card and group number**. The group state changes from the configured to deconfigured (or deconfigured to configured) state.

Use the following table and Figure 2-10 on page 2-12 to find specific DIMM AIX location code and physical location.

Group 1A	Location Code		Group 2A	Location Code
J11A	P1-M1.2		J12A	P1-M1.6
J21A	P1-M1.4		J22A	P1-M1.8
J31A	P1-M1.10		J32A	P1-M1.14
J41A	P1-M1.12		J42A	P1-M1.16
J51A	P1-M1.18		J52A	P1-M1.22
J61A	P1-M1.20		J62A	P1-M1.24
J71A	P1-M1.26		J72A	P1-M1.30
J81A	P1-M1.28		J82A	P1-M1.32
Group 1B	**Location Code**		**Group 2B**	**Location Code**
J11B	P1-M1.1		J12B	P1-M1.5
J21B	P1-M1.3		J22B	P1-M1.7
J31B	P1-M1.9		J32B	P1-M1.13
J41B	P1-M1.11		J42B	P1-M1.15
J51B	P1-M1.17		J52B	P1-M1.21
J61B	P1-M1.19		J62B	P1-M1.23
J71B	P1-M1.25		J72B	P1-M1.29
J81B	P1-M1.27		J82B	P1-M1.31

Service processor operational phases

This section provides a high-level flow of the phases of the service processor.

```
        Service Processor Power Applied
                    │
                    ▼
            Pre-Standby Phase
                    │
                    ▼

  ┌──────────┐      │
  │   ▼      │      ▼
  │  Standby Phase        Service Processor Menus Available
  │          │
  │          ▼
  │  Pre-Bringup Phase    System Initialized by Service Processor.
  │          │
  │          ▼
  │  Bring-Up Phase        SMS Menus Available
  │
  │  Runtime Phase        Diagnostic Service Aids Available
  └──────────┘
```
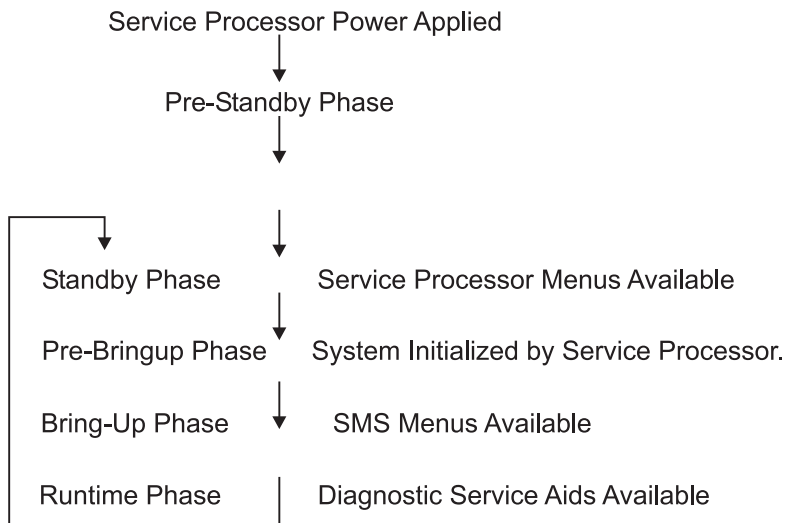
Pre-standby phase

This phase is entered when the server is connected to a power source. The server may or may not be fully powered on. This phase is exited when the Power-On Self Tests (POSTS) and configurations tasks are completed.

The Pre-Standby phase components are:

- Service Processor Initialization

  The service processor performs all necessary hardware or software initialization.

- Service Processor POST

  The service processor conducts Power-On Self Tests on its various work and code areas.

- Service processor Unattended Start Mode Checks

  To assist fault recovery. If unattended start mode is set, the service processor automatically reboots the server. The service processor does not wait for a user-input or power-on command, but will move straight through the phase and into the Bringup Phase. The unattended start mode can be reset by accessing SMS menus, or service processor menus.

Standby phase

The standby phase can be reached in two ways:

1. With the server OFF and power connected (the normal path), recognized by `OK` in the LCD display.

2. With the server ON after an operating system fault, recognized by `STBY` or an 8-digit code in the LCD display.

In the Standby phase, the service processor takes care of some automatic duties and is available for menus operation. The service processor remains in the standby phase until a power-on request is detected.

The Standby phase components are:

- Modem Configuration (not supported)

  The service processor will configure the modem (if installed) so that incoming calls may be received, or outgoing calls may be placed.

- Dial In (not supported)

  Monitor incoming phone line to answer calls, prompt for a password, verify the password and remotely display the standby menu. The remote session can be mirrored on the local ASCII console if the server is so equipped and the user enables this function.

- Menus

  The service processor menus are password protected. Before you can access them you need to know either General User (Power-On Password or POP) or Privileged User (Privileged Access Password or PAP).

Pre-Bringup phase

During this phase, the service processor performs the following actions:

- System verification
  - Chips LBIST verification
  - Chips ID verification
  - Chips Phase Lock Loop (PLL) verification
- System initialization
- Stop fan monitoring

Bringup phase

This phase is entered after the progress code indicator (checkpoint) "E0E0" has been displayed. The phase is exited upon loading of the operating system.

The Bringup phase components are:

- Retry Request Check

  The service processor checks to see if the previous IPL attempt failed. If two consecutive fails are detected, the service processor displays an error code and places an outgoing call to notify an external party if the user has enabled this option.

- Dial Out (not supported)

  The service processor can dial a pre-programmed telephone number in the event of an IPL failure. The service processor issues an error report with the last reported IPL status indicated and any other available error information.

- Update Operator Panel

  The service processor displays Operator Panel data on the ASCII terminal if a remote connection is active.

- Environmental Monitoring

  Environmental Monitoring is now controlled by the service processor instead of the base system, with expanded error recording and reporting.

- System Firmware Surveillance (Heartbeat Monitoring)

The service processor monitors and times the interval between system firmware heartbeats.

- Responding to System Processor Commands

  The service processor responds to any command issued by the system processor.

Runtime phase

This phase includes the tasks that the service processor performs during steady-state execution of the operating system.

- Environmental Monitoring

  The service processor monitors voltages, temperatures and fan speeds (on some servers).

- Responding to System Processor Commands

  The service processor responds to any command issued by the system processor.

- Run-Time Surveillance (Heartbeat Monitoring)

  If the device driver is installed and surveillance enabled, the service processor monitors the system heartbeat. If the heartbeat times out, the service processor places an outgoing call. This is different from the Bringup Phase scenario where two reboot attempts are made before placing an outgoing call.

Chapter 4. FRU removals and replacements

Attention: Components in the frame are susceptible to damage from static discharge. Always use an ESD wristband when working inside frame covers. (See "Personal ESD requirements" on page xvii for more details.) Do not touch the pins or circuitry on these components.

This chapter describes the removal and replacement of RS/6000 SP product-specific Field Replaceable Unit (FRU) components.

For common RS/6000 components, refer to the *RS/6000 SP: System Service Guide*.

Handling static-sensitive devices

Attention: Adapters, planars, disk drives, supervisor cards and memory cards are sensitive to static electricity discharge. These devices are wrapped in antistatic bags or containers to prevent this damage.

Perform the following procedures to prevent damage to these devices:

1. Do not remove the device from the antistatic bag or container until you are ready to install the device in the system unit.
2. You must wear an ESD wristband while installing or removing any static-sensitive devices.
3. With the device still in its antistatic bag, touch it to a metal frame of the system.
4. Grasp cards and boards by the edges. Hold drives by the frame. Avoid touching the solder joints and pins.
5. Handle the devices carefully in order to prevent permanent damage.
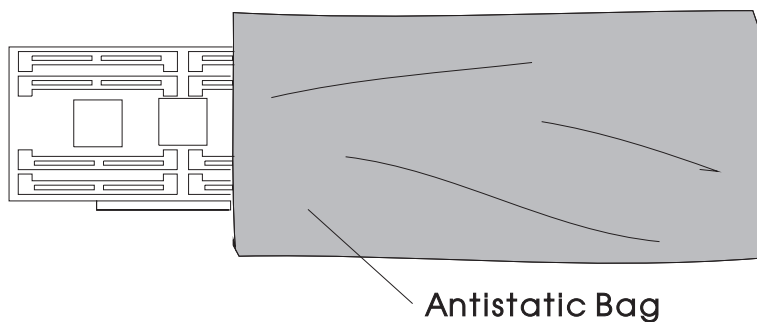
Antistatic Bag

Figure   4-1. Handling an anti-static device

Procedures for POWER3 SMP High Nodes

These procedures cover the removal and replacement of the POWER3 SMP High Node components.
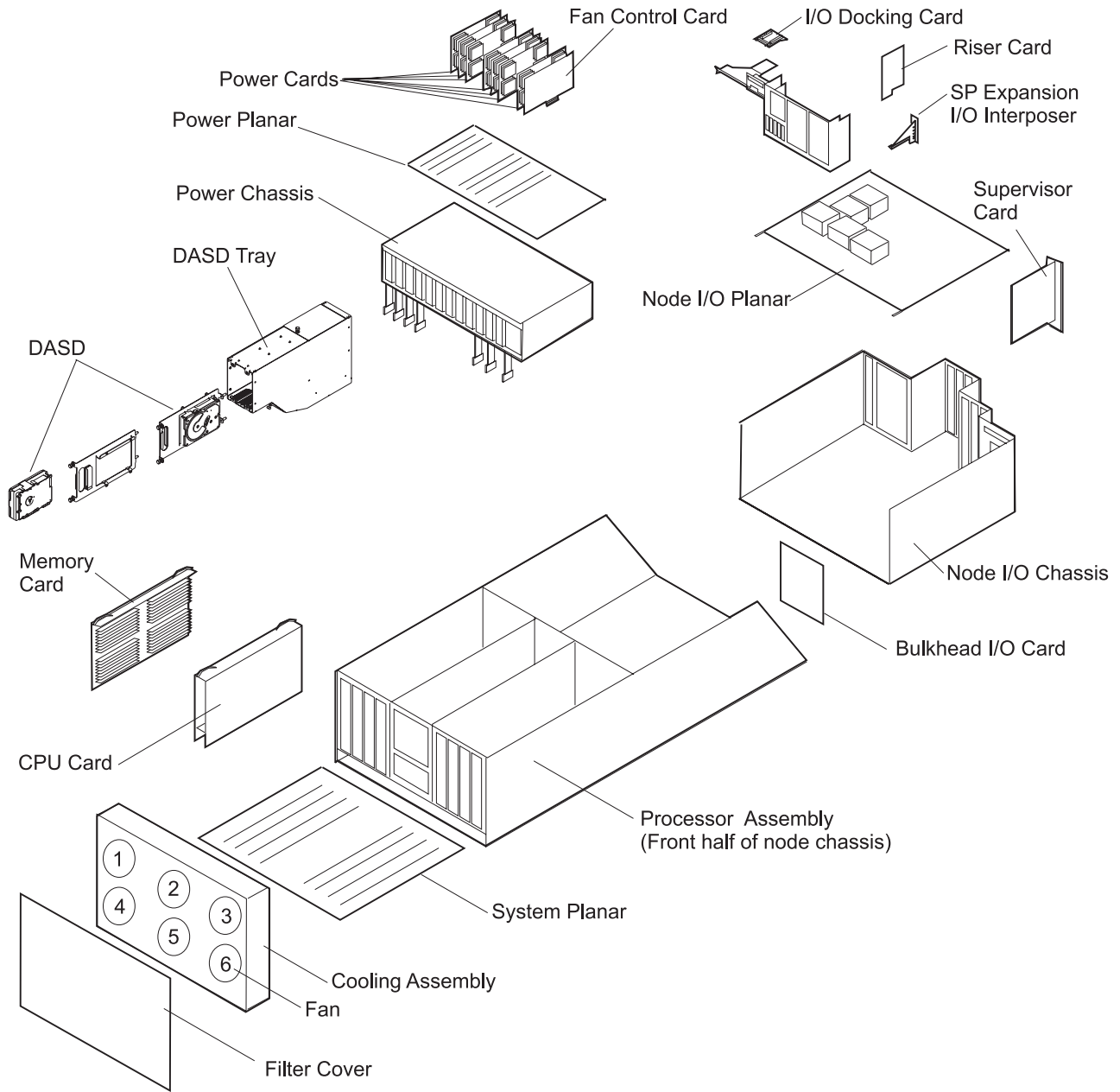
Figure 4-2. POWER3 SMP High Node high level component diagram

Power Planar (P3) (Above I/O Planar)

Power Cards

V10 V9

V8 V7 V6

V5

V2 V1

Fan Control (X1)

J10

J8 J9

V3

J6

V4

J7

J5 J4

J3

Supervisor Card (X1.1)

Bulkhead
Card

Q6 Q4 Q7 Q1
Q5 Q3 Q2

Supervisor Riser Card (X1)

SP Expansion
I/O Interposers

J9

I5 I4 I3 I2 I1

SPSMX2
Adapter (W2)

64-Bit
PCI Slots

32-Bit
PCI Slot

I/O Planar (P2)

J22

M1 M2

C1 C2

J24

C3 C4

M3 M4

Memory
Cards

CPU
Cards

J23

CPU
Cards

Memory
Cards

System Planar (P1)
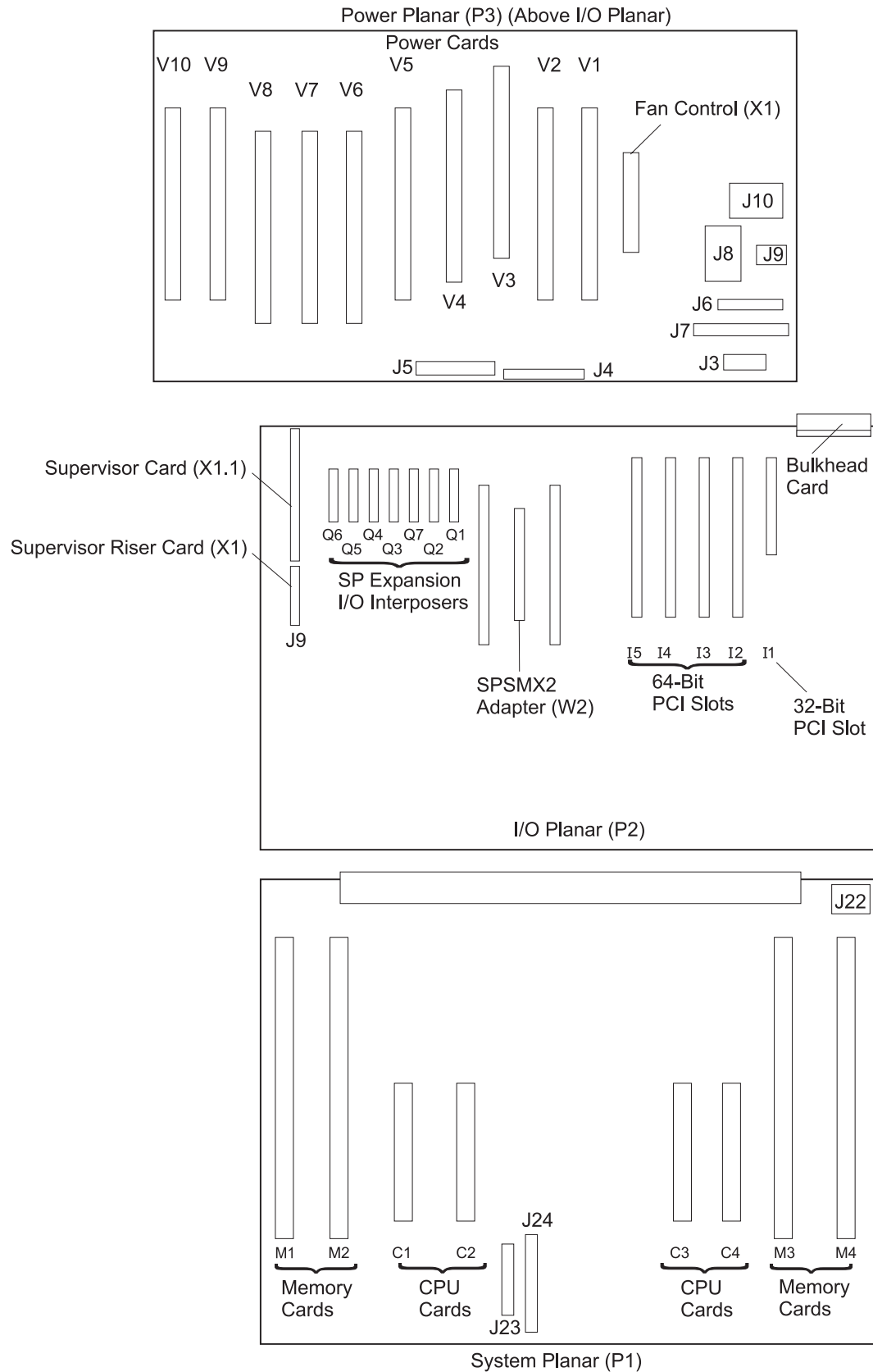
Figure 4-3. POWER3 SMP High Node (top view)

Removing the cooling assembly

Processor node procedure

1. Ensure that the node is offline (shutdown) and powered off from the control workstation.
2. Set the circuit breaker at the node rear panel in the Off ('0') position.
3. Loosen the screws on the POWER3 SMP High Node front panel and remove the panel and filter.
4. Remove the screws on the cooling assembly and pull the assembly forward to remove it from the front of the node.

Replacing the cooling assembly

Processor node procedure

1. Carefully align the connector plugs and reinstall the cooling assembly. Tighten the screws.
2. Install the POWER3 SMP High Node filter and front panel and tighten the screws.
3. Set the circuit breaker at the node rear panel in the On ('1') position.
4. Return to the procedure that directed you here.

Removing a fan

Processor node procedure

1. Set the circuit breaker, at the node rear panel, in the Off ('0') position.
2. Loosen the screws on the POWER3 SMP High Node front panel and remove the panel.
3. Remove the screws on the cooling assembly.
4. Pull the cooling assembly forward to remove it from the front of the node.
5. Remove the screws holding the fan to the cooling assembly.
6. Locate and disconnect the fan plug.

Replacing a fan

Processor node procedure

1. Reinstall new fan with the airflow indicator pointing to the rear of the chassis.
2. Connect the fan plug
3. Carefully align the connector plugs and install the cooling assembly. Then tighten the screws.
4. Install the POWER3 SMP High Node front panel and tighten the screws.
5. Set the circuit breaker at the node rear panel in the On ('1') position.
6. Return to the procedure that directed you here.

Removing a DASD

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Remove the cooling assembly, refer to "Removing the cooling assembly."
3. Loosen the DASD tray mounting screws.
4. Slide the DASD tray assembly forward from the processor assembly.
5. Disconnect the DASD SCSI cable.
6. Disconnect the DASD power cable.
7. Remove the DASD tray assembly from the DASD bay.
8. Remove the screws that secure the DASD to the tray assembly.
9. Remove the DASD from the tray assembly.

10. Check DASD jumper positions (if any) for address settings. Record jumper positions for proper setting on replacement DASD.

> **Note:** Make sure grounding strips, located around the edges, are firmly in place.
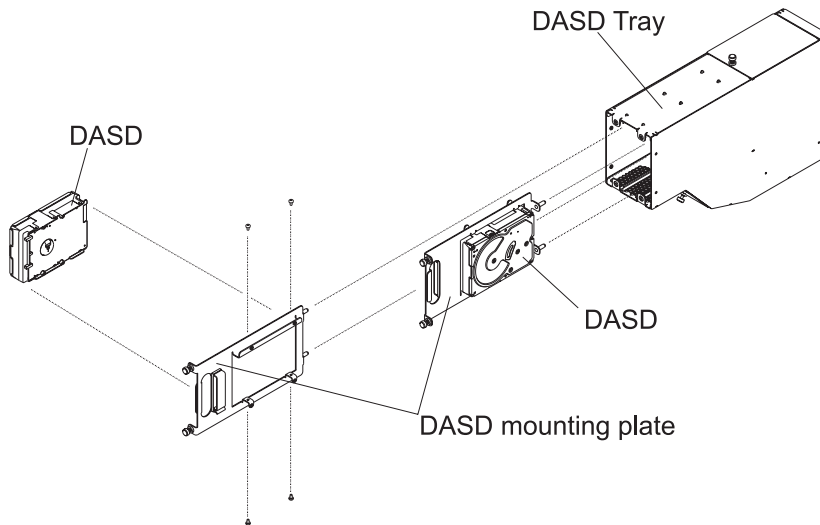
Figure   4-4. POWER3 SMP High Node DASD

Replacing a DASD

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Set jumper positions on DASD (if any) as recorded in removal procedure.
3. Install DASD in the DASD tray and tighten with screws retained in the removal procedure.
4. Place the DASD tray assembly partially in the DASD bay.
5. Reinstall the DASD power cable.
6. Reinstall the DASD SCSI cable.
7. Slide the DASD tray assembly fully into the processor assembly.
8. Tighten the DASD tray mounting screws.
9. Replace the cooling assembly, refer to "Replacing the cooling assembly" on page 4-6.
10. Return to the procedure that directed you here.

Removing a memory card

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Ensure the node has been shutdown and powered off before continuing.
3. Set the circuit breaker at the node rear panel in the Off ('0') position.
4. Set the circuit breakers in the 48-volt power cables in the Off ('0') position.
5. Remove the two 48-volt power cables from the rear of the node.
6. Remove the supervisor cable from the node by disconnecting the supervisor bus connector from the supervisor extension cable.
7. If necessary, remove the Ethernet BNC cable from the rear of the processor node.
8. Remove the processor assembly cover by removing the screws on the top of the cover, then lift the front edge while pulling it toward you.
9. Record the position of any cards to be removed.

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

10. Loosen the screws and lift the locking handles to disengage the memory card.
11. Remove the memory card.
12. Record the position of the DIMMs installed on the memory card. The DIMMs will be installed in the same positions on the replacement memory card.

Connector number
AIX location *Mx.yy* (where *x* = memory card number and *yy* = DIMM position)
DIMM bank number

J11B	Mx.1	(3)		J51B	Mx.17	(3)
J11A	Mx.2	(1)		J51A	Mx.18	(1)
J21B	Mx.3	(3)		J61B	Mx.19	(3)
J21A	Mx.4	(1)		J61A	Mx.20	(1)
J12B	Mx.5	(4)		J52B	Mx.21	(4)
J12A	Mx.6	(2)		J52A	Mx.22	(2)
J22B	Mx.7	(4)		J62B	Mx.23	(4)
J22A	Mx.8	(2)		J62A	Mx.24	(2)

J31B	Mx.9	(3)		J71B	Mx.25	(3)
J31A	Mx.10	(1)		J71A	Mx.26	(1)
J41B	Mx.11	(3)		J81B	Mx.27	(3)
J41A	Mx.12	(1)		J81A	Mx.28	(1)
J32B	Mx.13	(4)		J72B	Mx.29	(4)
J32A	Mx.14	(2)		J72A	Mx.30	(2)
J42B	Mx.15	(4)		J82B	Mx.31	(4)
J42A	Mx.16	(2)		J82A	Mx.32	(2)

J4   J3   J2   J1

Figure   4-5. POWER3 SMP High Node memory card

Replacing a memory card

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the DIMMs on the replacement memory card in the positions recorded in the removal procedure.
3. Align the memory card in the slot.

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

4. Push down on the locking handles to engage the memory card. Tighten the screws.
5. Reinstall the processor assembly cover and tighten the screws on the top of the assembly.
6. If necessary, install the Ethernet BNC cable in the rear of the processor node.
7. Install the supervisor cable to the node by connecting the supervisor bus connector to the supervisor extension cable.
8. Install the two 48-volt power cables in the rear of the node.
9. Set both circuit breakers on the 48-volt power cables in the On ('1') position.
10. Set the circuit breaker on the node rear panel in the On ('1') position.
11. Return to the procedure that directed you here.

Removing a CPU card

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Ensure the node has been shutdown and powered off before continuing.
3. Set the circuit breaker at the node rear panel in the Off ('0') position.
4. Set the circuit breakers in the 48-volt power cables in the Off ('0') position.
5. Remove the two 48-volt power cables from the rear of the node.
6. Remove the supervisor cable from the node by disconnecting the supervisor bus connector from the supervisor extension cable.
7. If necessary, remove the Ethernet BNC cable from the rear of the processor node.
8. Remove the processor assembly cover by removing the screws on the top of the cover, then lift the front edge while pulling it toward you.
9. Record the position of any cards to be removed.

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

10. Loosen the screws and lift the locking handles to disengage the CPU card.
11. Remove the CPU card.

Replacing a CPU card

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Align the CPU card in the slot.

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

3. Push down on the locking handles to engage the CPU card. Tighten the screws.
4. Reinstall the processor assembly cover and tighten the screws on the top of the assembly.
5. If necessary, install the Ethernet BNC cable in the rear of the processor node.
6. Install the supervisor cable to the node by connecting the supervisor bus connector to the supervisor extension cable.
7. Install the two 48-volt power cables in the rear of the node.
8. Set both circuit breakers on the 48-volt power cables in the On ('1') position.
9. Set the circuit breaker on the node rear panel in the On ('1') position.
10. Return to the procedure that directed you here.

Removing the processor assembly docking card

Processor node procedure

1. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
2. Ensure ESD antistatic wrist device is attached.
3. Record the position of any cards to be removed.

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

4. Loosen the screws and lift the locking handles to disengage the center CPU cards.
5. Remove the center CPU cards.
6. Refer to "Removing a DASD" on page 4-6 to remove the DASD power and SCSI cables.
7. Remove the screws on the processor assembly top cover, then lift the front edge while pulling it toward you, to remove the top cover.
8. Remove the screws holding the DASD housing to the processor assembly, and remove the DASD housing.

9. Unplug the cables connected to the processor assembly docking card.
10. Remove the screws holding the processor assembly docking card to the processor assembly, and remove the card.

Processor assembly docking card

Chassis assembly
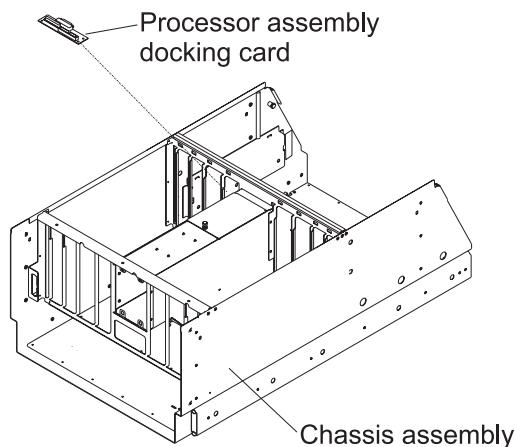
Figure   4-6. POWER3 SMP High Node processor assembly docking card

Replacing the processor assembly docking card

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the processor assembly docking card on the processor assembly, and tighten the screws.
3. Install the cables connected to the processor assembly docking card.
4. Install the DASD housing to the processor assembly, and tighten the screws.
5. Align the CPU cards in the slots.

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

6. Push down on the locking handles to engage each CPU card. Tighten the screws.
7. Install the processor assembly top cover, and tighten the screws.
8. Refer to "Replacing a DASD" on page 4-7 to install the DASD power and SCSI cables.
9. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
10. Return to the procedure that directed you here.

Removing the I/O power cable

Processor node procedure

1. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
2. Ensure ESD antistatic wrist device is attached.
3. Slide the node I/O chassis out as far as it will go.
4. Disengage the I/O power cable from the rear wall of the processor assembly.
5. Refer to "Removing a CPU card" on page 4-9 to remove the processor assembly top cover and the CPU card at location **C2**.
6. Remove the screw from the DASD bay top access plate, then remove the plate.
7. Unplug the node I/O power cable from J05 of the power planar.
8. Remove the I/O power cable.

I/O planar detail

Native I/O cable

I/O power cable

SCSI cable

I/O signal cable

I/O chassis assembly

Power supply assembly

Power planar

I/O planar

J5

J4

Chassis assembly
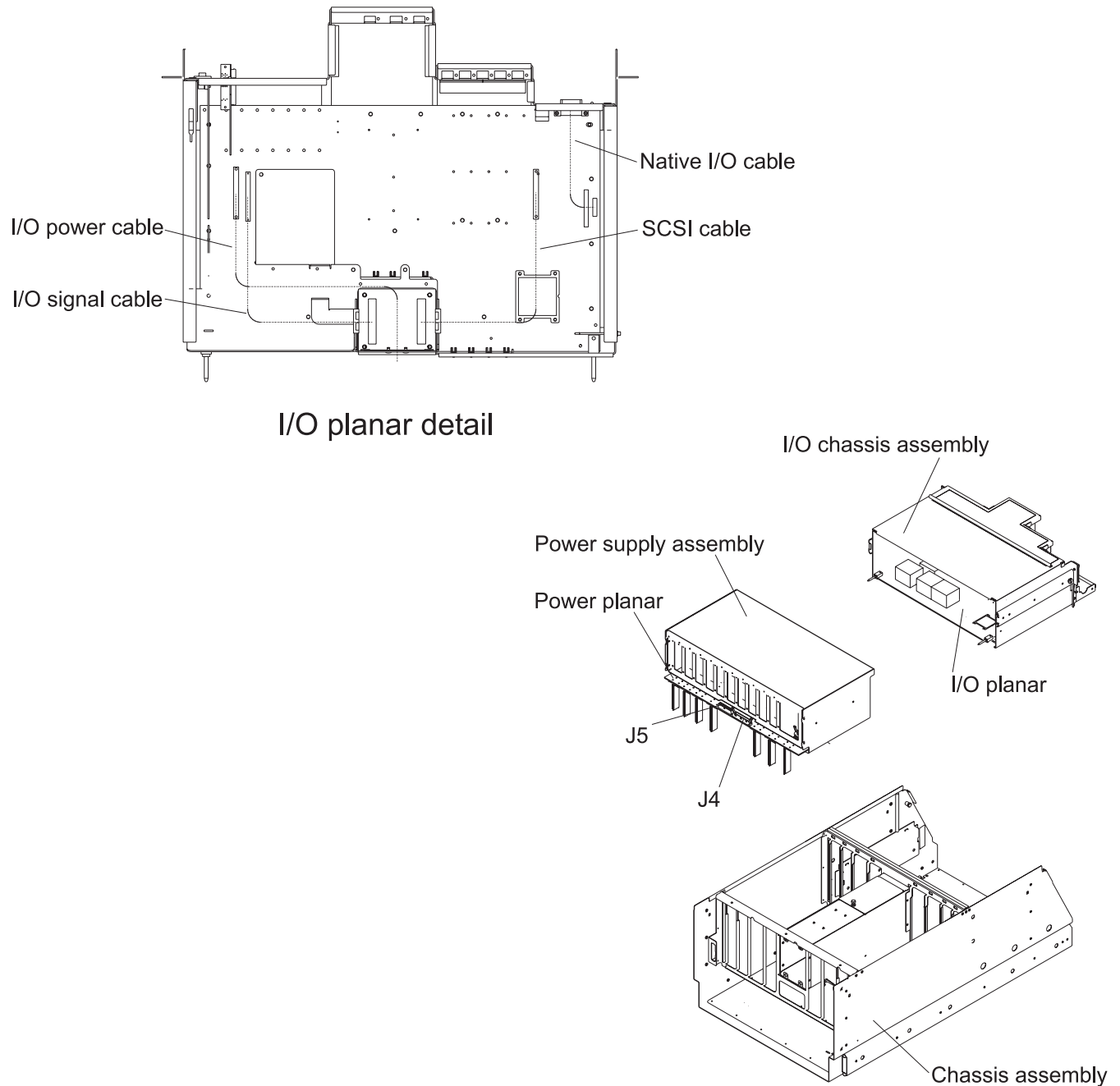
Figure 4-7. POWER3 SMP High Node I/O power cable

Replacing the I/O power cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install node I/O power cable in J05 on the power planar.
3. Install the I/O power cable to the rear wall of the processor assembly.
4. Replace the DASD bay top access plate and tighten the screw.
5. Refer to "Replacing a CPU card" on page 4-9 to install the CPU card in location **C2** and the processor assembly top cover.
6. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.

7. Return to the procedure that directed you here.

Removing the 34-position signal cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state
3. Refer to "Removing a CPU card" on page 4-9 to remove the processor assembly top cover and the CPU cards at locations **C1** and **C2**.
4. Remove the screws from the DASD bay top and bottom access plates and remove the plates.
5. Remove the 34-position signal cable from the system planar at J24.
6. Remove the screws on the edge of the power assembly cover. Remove the cover by lifting the front edge while pulling it toward you.
7. Remove the 34-position signal cable from the power planar at J07.
8. Remove the cable.

Replacing the 34-position signal cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the 34-position signal cable at J07 on the power planar and route it through the DASD bay.
3. Install the 34-position signal cable at J24 in the system planar.
4. Replace the DASD bay top and bottom access plates and tighten the screws.
5. Refer to "Replacing a CPU card" on page 4-9 to install the CPU cards in locations **C1** and **C2** and the processor assembly top cover.
6. Install the power assembly cover and tighten the screws on the edge of the assembly.
7. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
8. Return to the procedure that directed you here.

Removing the 26-position signal cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
3. Refer to "Removing a CPU card" on page 4-9 to remove the processor assembly top cover and the CPU cards at locations **C1** and **C2**.
4. Remove the screws from the DASD bay top and bottom access plates and remove the plates.
5. Remove the 26-position signal cable from the system planar at J23.
6. Remove the screws on the edge of the power assembly cover. Remove the cover by lifting the front edge while pulling it toward you.
7. Remove the 26-position signal cable from the power planar at J06.
8. Remove the cable.

Replacing the 26-position signal cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the 26-position signal cable at J06 on the power planar and route it through the DASD bay.
3. Install the 26-position signal cable at J23 in the system planar.
4. Replace the DASD bay top and bottom access plates and tighten the screws.
5. Refer to "Replacing a CPU card" on page 4-9 to install the CPU cards and the processor assembly top cover.
6. Install the power assembly cover and tighten the screws on the edge of the assembly.
7. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
8. Return to the procedure that directed you here.

Removing the 16-position system planar power cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
3. Refer to "Removing a memory card" on page 4-7 to remove the processor assembly top cover and the memory cards on the right side of the processor assembly at locations **M3** and **M4**.
4. Remove the 16-position system planar power cable from the system planar at J22.
5. Remove the screws on the edge of the power assembly cover. Remove the cover by lifting the front edge while pulling it toward you.
6. Remove the 16-position system planar power cable from the power planar at J03.
7. Remove the cable.

Replacing the 16-position system planar power cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the 16-position system planar power cable at J03 on the power planar and route it through the processor assembly to the right-rear corner.
3. Install the power assembly cover and tighten the screws on the edge of the assembly.
4. Install the 16-position system planar power cable at J22 in the system planar.
5. Refer to "Replacing a memory card" on page 4-8 to install the memory cards in locations **M3** and **M4** and the processor assembly top cover.
6. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
7. Return to the procedure that directed you here.

Removing the fan/DASD power cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
3. Remove the processor assembly top cover by removing the screws on the top cover, then lift the front edge while pulling it toward you.
4. Remove the cooling assembly, refer to "Removing the cooling assembly" on page 4-6.

5. Unscrew the DASD bay top and bottom access plate screws and remove the plates.
6. Remove the Fan/DASD power cable from the DASDs and the SCSI/DASD power cable.
7. Remove the cooling assembly power connectors from the front of the chassis.
8. Remove the screws on the edge of the power assembly cover. Remove the cover by lifting the front edge while pulling it toward you.
9. Remove the Fan/DASD power cable from the power planar at J08 and at J09.
10. Remove the cable.

Replacing the fan/DASD power cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the Fan/DASD power cable at J08 and at J09 on the power back plane, and route the cable through the processor and DASD assemblies to the front of the chassis.
3. Install the cooling assembly power connectors in the front of the chassis.
4. Install the cable to the DASDs and the SCSI/DASD power cable.
5. Replace the DASD bay top and bottom access plate screws and tighten the screws.
6. Replace the cooling assembly, refer to "Replacing the cooling assembly" on page 4-6.
7. Install the power assembly cover and tighten the screws on the edge of the assembly.
8. Install the processor assembly top cover, and tighten the screws on the top of the assembly.
9. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
10. Return to the procedure that directed you here.

Removing the SCSI/DASD power cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
3. Remove the cooling assembly, refer to "Removing the cooling assembly" on page 4-6.
4. Unscrew the DASD bay top and bottom access plate screws and remove the plates.
5. Remove the SCSI/DASD power cable from the DASDs, and the fan/DASD power cable.
6. Remove CPU cards C1 and C2, refer to "Removing a CPU card" on page 4-9.
7. Remove the SCSI/DASD power cable from the processor assembly docking card at J02.
8. Remove the cable.

Replacing the SCSI/DASD power cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the SCSI/DASD power cable at J02 on the processor assembly docking card.
3. Install the SCSI/DASD power cable to the DASDs, and the fan/DASD power cable.
4. Replace CPU cards C1 and C2, refer to "Replacing a CPU card" on page 4-9.
5. Replace the DASD bay top and bottom access plate screws and tighten the screws.
6. Replace the cooling assembly, refer to "Replacing the cooling assembly" on page 4-6.
7. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
8. Return to the procedure that directed you here.

Removing the processor assembly I/O signal cable

Processor node procedure

1. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
2. Ensure ESD antistatic wrist device is attached.
3. Refer to "Removing a CPU card" on page 4-9 to remove the processor assembly top cover and the CPU cards at locations **C3** and **C4**.
4. Remove the screw from the DASD bay top access plate and remove the plate.
5. Remove the I/O signal cable from J03 on the processor assembly docking card.
6. Remove the I/O signal cable from J04 on the power planar.
7. Remove the I/O signal cable.

Replacing the processor assembly I/O signal cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the I/O signal cable at J04 on the power planar.
3. Install the I/O signal cable in J03 on the processor assembly docking card.
4. Replace the DASD bay top access plate and tighten the screw.
5. Refer to "Replacing a CPU card" on page 4-9 to install the CPU cards in locations **C3** and **C4** and the processor assembly top cover.
6. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
7. Return to the procedure that directed you here.

Removing the system planar

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
3. Refer to "Removing a CPU card" on page 4-9 to remove the processor assembly top cover and all CPU cards.
4. Refer to "Removing a memory card" on page 4-7 to remove all memory cards.
5. Disengage the system planar by removing the screws at the front of the assembly and simultaneously rotating the right caming wheel counterclockwise and the left caming wheel clockwise.
6. Remove the cables from the left-front of the system planar.
7. Pull the system planar toward you and remove the cable in the right-rear of the system planar.
8. Remove the system planar.
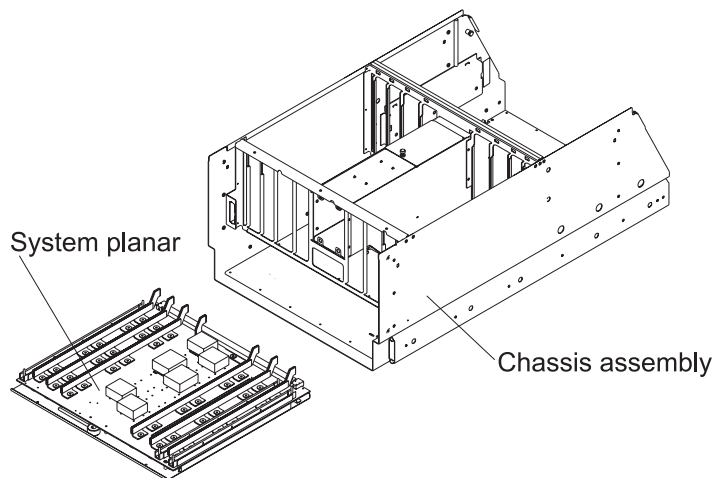
Figure 4-8. POWER3 SMP High Node system planar

Replacing the system planar

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the system planar.
3. Install the cable in the right-rear of the system planar.
4. Engage the system planar by simultaneously rotating the right caming wheel clockwise and the left caming wheel counterclockwise. Then install the screws at the front of the planar assembly.
5. Install the cables at the left-front of the system planar.
6. Refer to "Replacing a memory card" on page 4-8 to replace all memory cards.
7. Refer to "Replacing a CPU card" on page 4-9 to replace all CPU cards and the processor assembly cover.
8. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
9. Return to the procedure that directed you here.

Removing the SPS MX2 adapter

Note: To access components in the rear of the node, it may be helpful (but not necessary) to remove the cable management bracket. Be sure to replace the bracket after replacing the FRU.

Processor node procedure

1. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
2. Ensure ESD antistatic wrist device is attached.
3. Remove the SP switch cable at the rear of the node.
4. Remove the screws on the edge of the I/O assembly cover. Remove the cover by sliding it back and lifting the edge closest to you.
5. Grasp the SPS MX2 adapter by the pull tabs and pull it out of the slot.
6. Remove the protective cover from port P1 and retain for later use.
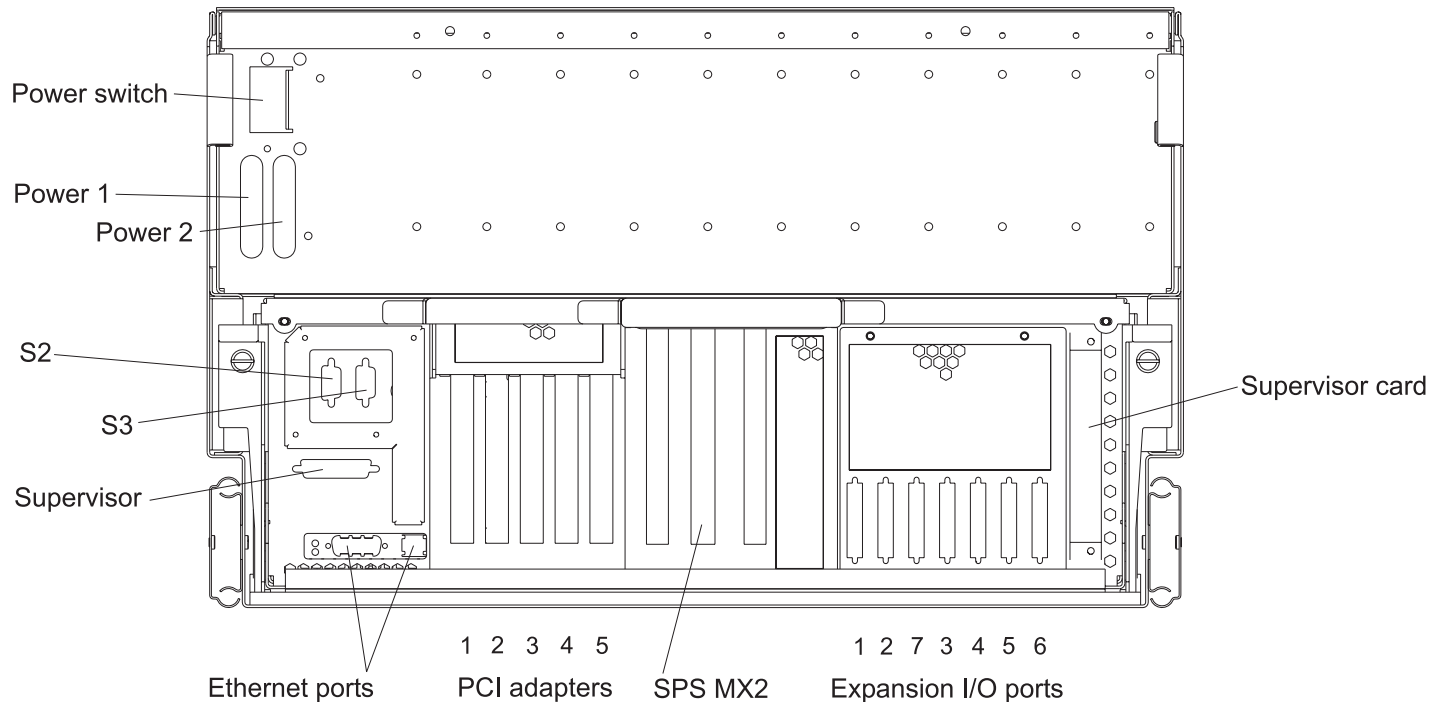
Figure   4-9. POWER3 SMP High Node SPS MX2 adapter

Replacing the SPS MX2 adapter

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the protective cover, that was previously removed, on port P1 (if necessary).
3. Align SPS MX2 adapter in slot, then push card into the slot.
4. Install the I/O assembly cover and tighten the screws on the edge of the assembly.
5. Install the SP switch cable at the rear of the node.
6. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
7. Return to the procedure that directed you here.

Removing an SP expansion I/O interposer

Note: To access components in the rear of the node, it may be helpful (but not necessary) to remove the cable management bracket. Be sure to replace the bracket after replacing the FRU.

Processor node procedure

1. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
2. Ensure ESD antistatic wrist device is attached.
3. Remove the screws on the edge of the I/O assembly cover. Remove the cover by sliding it back and lifting the edge closest to you.
4. Record the location of any SP Expansion I/O Unit cables attached at the rear of the node.
5. Remove the SP Expansion I/O Unit cables.
6. Remove the standoffs holding SP expansion I/O interposers to the node rear panel.
7. Remove the screw holding the rear panel to the chassis and remove the panel.
8. Remove the SP expansion I/O interposers from the node I/O planar.

Replacing an SP expansion I/O interposer

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the SP expansion I/O interposer to the node I/O planar.
3. Install the rear panel and tighten the screws.
4. Install the standoffs to secure the SP expansion I/O interposer.
5. Install the I/O assembly cover and tighten the screws on the edge of the assembly.
6. Install any SP Expansion I/O Unit cables in the rear of the node.
7. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
8. Return to the procedure that directed you here.

Removing a PCI adapter card

Processor node procedure

1. Record the location of any I/O adapter cables and cards you are going to remove to aid in later rein-stallation.
2. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
3. Ensure ESD antistatic wrist device is attached.
4. Remove the screws on the edge of the I/O assembly cover. Remove the cover by sliding it back and lifting the edge closest to you.
5. Check for internal connections to other adapter cards or cables. Before removing any cards or cables, be sure to record these connections.
6. If the adapter card has an card extender that holds the front end of the adapter, release the extender by pressing the locking tab to the side.
7. Place the plastic inserts that came with the ship group on either side of the card being removed.
8. Grasp the adapter by the pull tabs and pull it out of the slot.
9. Record any jumper or switch settings on the card.

Replacing a PCI adapter card

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Check for jumpers or switches to be set on this card, and set as appropriate.
3. Align adapter in slot, then push card into the slot.
4. Remove the plastic inserts from both sides of the card and return them to the ship group.
5. If this card has any internal connections to other adapters or cables, reconnect them as appropriate.
6. Install the I/O assembly cover and tighten the screws on the edge of the assembly.
7. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
8. Return to the procedure that directed you here.

Removing the node supervisor card

Note: To access components in the rear of the node, it may be helpful (but not necessary) to remove the cable management bracket. Be sure to replace the bracket after replacing the FRU.

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.

2. Ensure the node had been shutdown and powered off before continuing.
3. Set the circuit breaker at the node rear panel in the Off ('0') position.
4. Set the circuit breakers in the power cables in the Off ('0') position.
5. Remove the two screws holding the node supervisor card to the node rear panel.
6. Remove the node supervisor card.
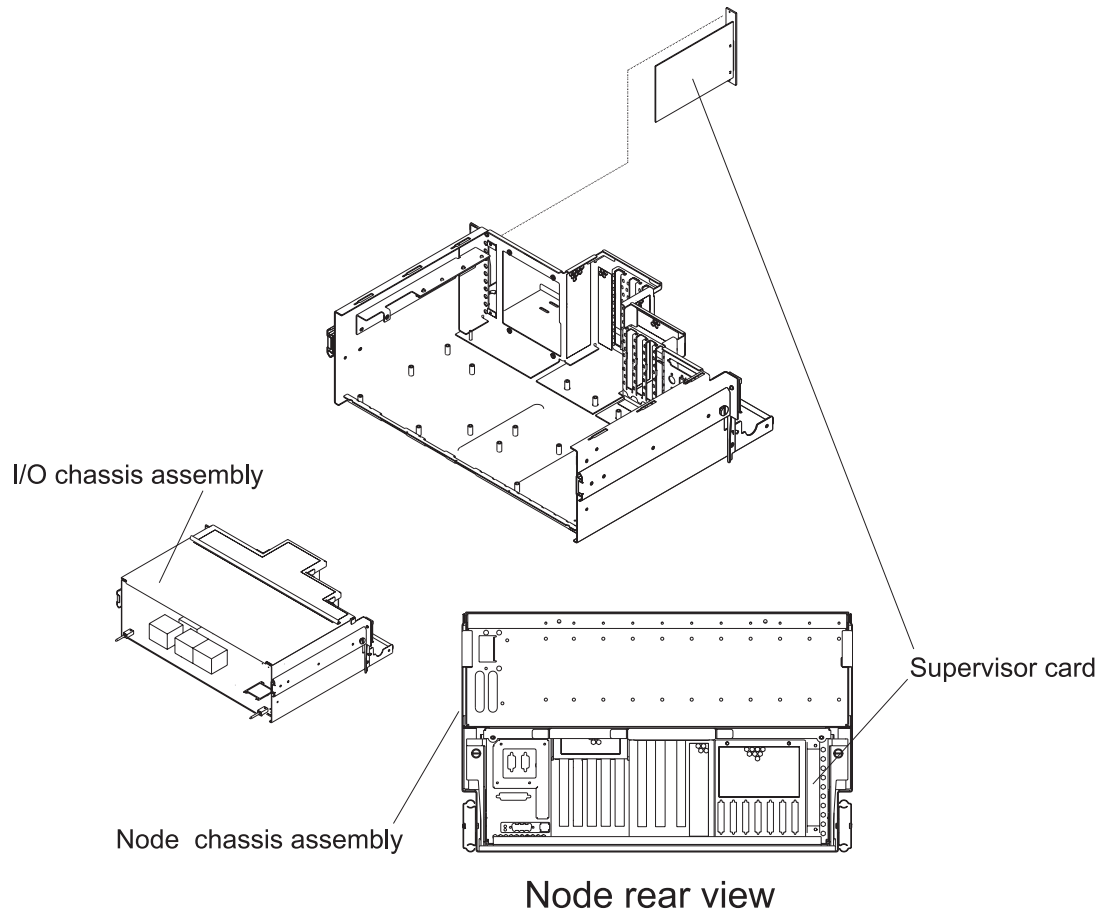
Figure 4-10. POWER3 SMP High Node supervisor card

Replacing the node supervisor card

Note: Inform the customer that the clocks will need to be reset. Refer the customer to "Resetting the clock and bootlist after servicing a node" on page 3-16 or *IBM Parallel System Support Programs for AIX: Installation Guide* for this procedure.

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the node supervisor card in the node rear panel and tighten the two screws.
3. Set the circuit breakers in the power cables in the On ('1') position.
4. Set the circuit breaker at the node rear panel in the On ('1') position.
5. Perform "Updating the node supervisor code" on page 3-15.
6. Return to the procedure that directed you here.

Removing the PICO riser card

Note: To access components in the rear of the node, it may be helpful (but not necessary) to remove the cable management bracket. Be sure to replace the bracket after replacing the FRU.

Processor node procedure

1. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
2. Ensure ESD antistatic wrist device is attached.
3. Remove the screws on the edge of the I/O assembly cover. Remove the cover by sliding it back and lifting the edge closest to you.
4. Remove the two screws holding the node supervisor card to the node rear panel.
5. Remove the node supervisor card from the node.
6. Remove the screw connecting the riser card to the upper card guide bracket.
7. Remove the node riser card.

Replacing the PICO riser card

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the node riser card to the I/O planar (at **J9**) and tighten the screw to the node upper card guide bracket.
3. Install the node supervisor card.
4. Tighten the screws holding the node supervisor card to the node rear panel.
5. Install the I/O assembly cover and tighten the screws on the edge of the assembly.
6. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
7. Return to the procedure that directed you here.

Removing the I/O docking card

Processor node procedure

1. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
2. Ensure ESD antistatic wrist device is attached.
3. Remove the screws on the edge of the I/O assembly cover. Remove the cover by sliding it back and lifting the edge closest to you.
4. Disengage the cables connected to the I/O docking card.
5. Remove the screws holding the I/O docking card to the air baffle assembly.
6. Remove the docking card.
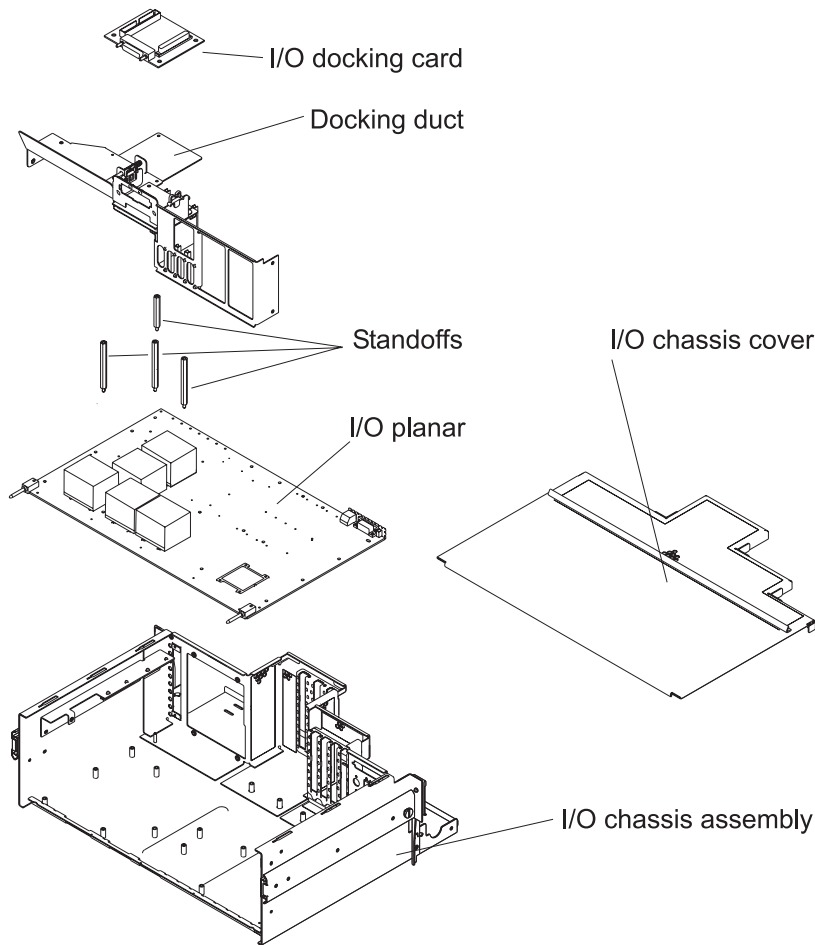
Figure 4-11. POWER3 SMP High Node I/O docking card

Replacing the I/O docking card

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the I/O docking card on the air baffle assembly, and tighten the screws.
3. Install the cables connected to the I/O docking card.
4. Install the I/O assembly cover and tighten the screws on the edge of the assembly.
5. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
6. Return to the procedure that directed you here.

Removing the I/O bulkhead card

Processor node procedure

1. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
2. Ensure ESD antistatic wrist device is attached.
3. Record and remove the external cables connected to the I/O bulkhead card at the node rear panel.
4. Remove the screws on the edge of the I/O assembly cover. Remove the cover by sliding it back and lifting the edge closest to you.
5. Disengage the internal cables connected to the I/O bulkhead card.
6. Remove the bulkhead connector cover plate attached to the node rear panel.

7. Remove the screws and standoffs holding the I/O bulkhead card to the node rear panel.
8. Remove the I/O bulkhead card.
9. Retain card gasket for later reinstallation.
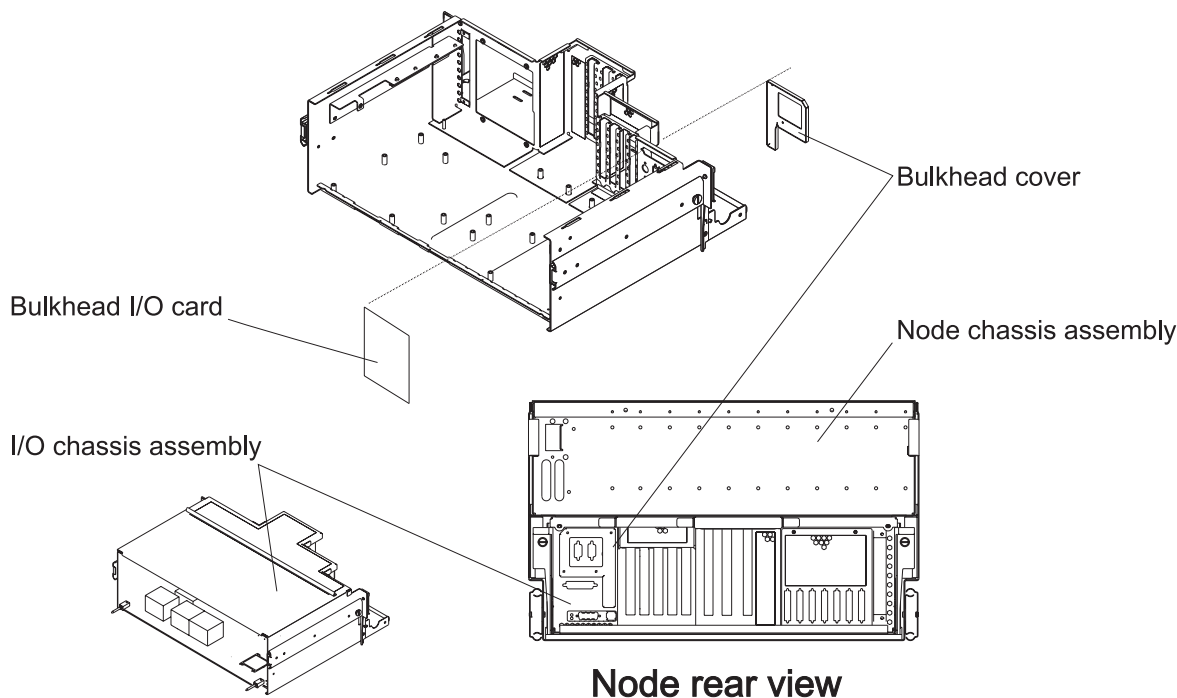
Figure   4-12. POWER3 SMP High Node I/O bulkhead card

Replacing the I/O bulkhead card

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install card gasket retained during removal procedure.
3. Install the I/O bulkhead card to the node rear panel, then tighten the screws and standoffs.
4. Install the internal cables connected to the I/O bulkhead card.
5. Install the I/O assembly cover and tighten the screws on the edge of the assembly.
6. Replace the bulkhead connector cover plate to the node rear panel.
7. Install the external cables connected to the I/O bulkhead card at the node rear panel.
8. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
9. Return to the procedure that directed you here.

Removing the I/O planar signal cable

Processor node procedure

1. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
2. Ensure ESD antistatic wrist device is attached.
3. Remove the screws on the edge of the I/O assembly cover. Remove the cover by sliding it back and lifting the edge closest to you.
4. Remove the node I/O signal cable from P02 on the node I/O planar.
5. Remove the node I/O signal cable from J03 on the I/O docking card.
6. Remove the node I/O signal cable.

Replacing the I/O planar signal cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the node I/O signal cable at P02 on the node I/O planar.
3. Install the node I/O signal cable in J03 on the I/O docking card.
4. Install the I/O assembly cover and tighten the screws on the edge of the assembly.
5. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
6. Return to the procedure that directed you here.

Removing the I/O planar power cable

Processor node procedure

1. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
2. Ensure ESD antistatic wrist device is attached.
3. Remove the screws on the edge of the I/O assembly cover. Remove the cover by sliding it back and lifting the edge closest to you.
4. Remove the node I/O power cable from P01 on the node I/O planar.
5. Remove the node I/O power cable from the air baffle assembly.
6. Remove the node I/O power cable.

Replacing the I/O planar power cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the node I/O power cable in P01 on the node I/O planar.
3. Install the node I/O power cable to the air baffle assembly.
4. Install the I/O assembly cover and tighten the screws on the edge of the assembly.
5. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
6. Return to the procedure that directed you here.

Removing the SCSI/docking cable

Processor node procedure

1. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
2. Ensure ESD antistatic wrist device is attached.
3. Remove the screws on the edge of the I/O assembly cover. Remove the cover by sliding it back and lifting the edge closest to you.
4. Unplug the SCSI/docking cable from J15 of the node I/O planar.
5. Unplug the SCSI/docking cable from J02 of the I/O docking card.
6. Remove the cable.

Replacing the SCSI/docking cable

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install SCSI/docking cable in J15 of the node I/O planar.
3. Install SCSI/docking cable in J02 of the I/O docking card.
4. Install the I/O assembly cover and tighten the screws on the edge of the assembly.
5. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
6. Return to the procedure that directed you here.

Removing the bulkhead signal cable 1

Processor node procedure

1. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
2. Ensure ESD antistatic wrist device is attached.
3. Remove the screws on the edge of the I/O assembly cover. Remove the cover by sliding it back and lifting the edge closest to you.
4. Unplug bulkhead signal cable 1 from J12 of the node I/O planar.
5. Unplug bulkhead signal cable 1 from J01 of the bulkhead card.
6. Remove the cable.

Replacing the bulkhead signal cable 1

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install bulkhead signal cable 1 in J12 of the node I/O planar.
3. Install bulkhead signal cable 1 in J01 of the bulkhead card.
4. Install the I/O assembly cover and tighten the screws on the edge of the assembly.
5. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
6. Return to the procedure that directed you here.

Removing the bulkhead signal cable 2

Processor node procedure

1. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
2. Ensure ESD antistatic wrist device is attached.
3. Remove the screws on the edge of the I/O assembly cover. Remove the cover by sliding it back and lifting the edge closest to you.
4. Unplug bulkhead signal cable 2 from J14 of the node I/O planar.
5. Unplug bulkhead signal cable 2 from J02 of the bulkhead card.
6. Remove the cable.

Replacing the bulkhead signal cable 2

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install bulkhead signal cable 2 in J14 of the node I/O planar.
3. Install bulkhead signal cable 2 in J02 of the I/O bulkhead card.
4. Install the I/O assembly cover and tighten the screws on the edge of the assembly.
5. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
6. Return to the procedure that directed you here.

Removing the node I/O planar

Attention: Licensed programs frequently rely on network configuration and system information stored on the VPD on the I/O planar (see Figure 2-11 on page 2-13). If the MAPs indicate that the I/O planar should be replaced, swap the VPD from the old I/O planar to the new one. If the old VPD module has to be replaced, call technical support for recovery instructions. If recovery is not possible, notify the system owner that new keys from licensed programs may be required.

Note: To access components in the rear of the node, it may be helpful (but not necessary) to remove the cable management bracket. Be sure to replace the bracket after replacing the FRU.

Processor node procedure

1. Record the location of any I/O adapter cables, SP Expansion I/O Unit cables, and cards you are going to remove (to aid in later installation).
2. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
3. Ensure ESD antistatic wrist device is attached.
4. Remove any SP switch adapter cables attached at the rear of the node.
5. Remove any I/O adapter cables attached at the rear of the node.
6. Remove any SP Expansion I/O Unit cables attached at the rear of the node.
7. Remove the screws on the edge of the I/O assembly cover. Remove the cover by sliding it back and lifting the edge closest to you.
8. Remove the SPS MX2 adapter (if present).
9. Check for internal connections to other adapter cards or cables. Record these connections before removing them.
10. If the adapter card has an card extender that holds the front end of the adapter, release the extender by pressing the locking tab to the side.
11. Grasp the adapter by the pull tabs and pull it out of the slot.
12. Record any jumper or switch settings on the card.
13. Remove the screws holding the node supervisor card to the node rear panel, and remove the card.
14. Remove the screw holding the riser card to the upper card guide bracket, and remove the card.
15. Remove the standoffs holding to SP Expansion I/O Unit adapters to the node rear panel.
16. Remove the screw holding the rear panel to the chassis and remove the panel.
17. Remove the SP Expansion I/O Unit adapters from the node I/O planar.
18. Remove the screws holding the node supervisor upper card guide bracket to the chassis.
19. Remove the screws holding the air baffle assembly to the I/O assembly, and remove the baffle.
20. Remove all the cables connected to the node I/O planar.
21. Remove the air baffle standoffs from the planar and save for installation on the new planar.
22. Remove the screws holding the node supervisor lower card guide bracket to the I/O planar and remove the bracket.
23. Remove the screws holding the node I/O planar to the I/O assembly.
24. Remove the node I/O planar
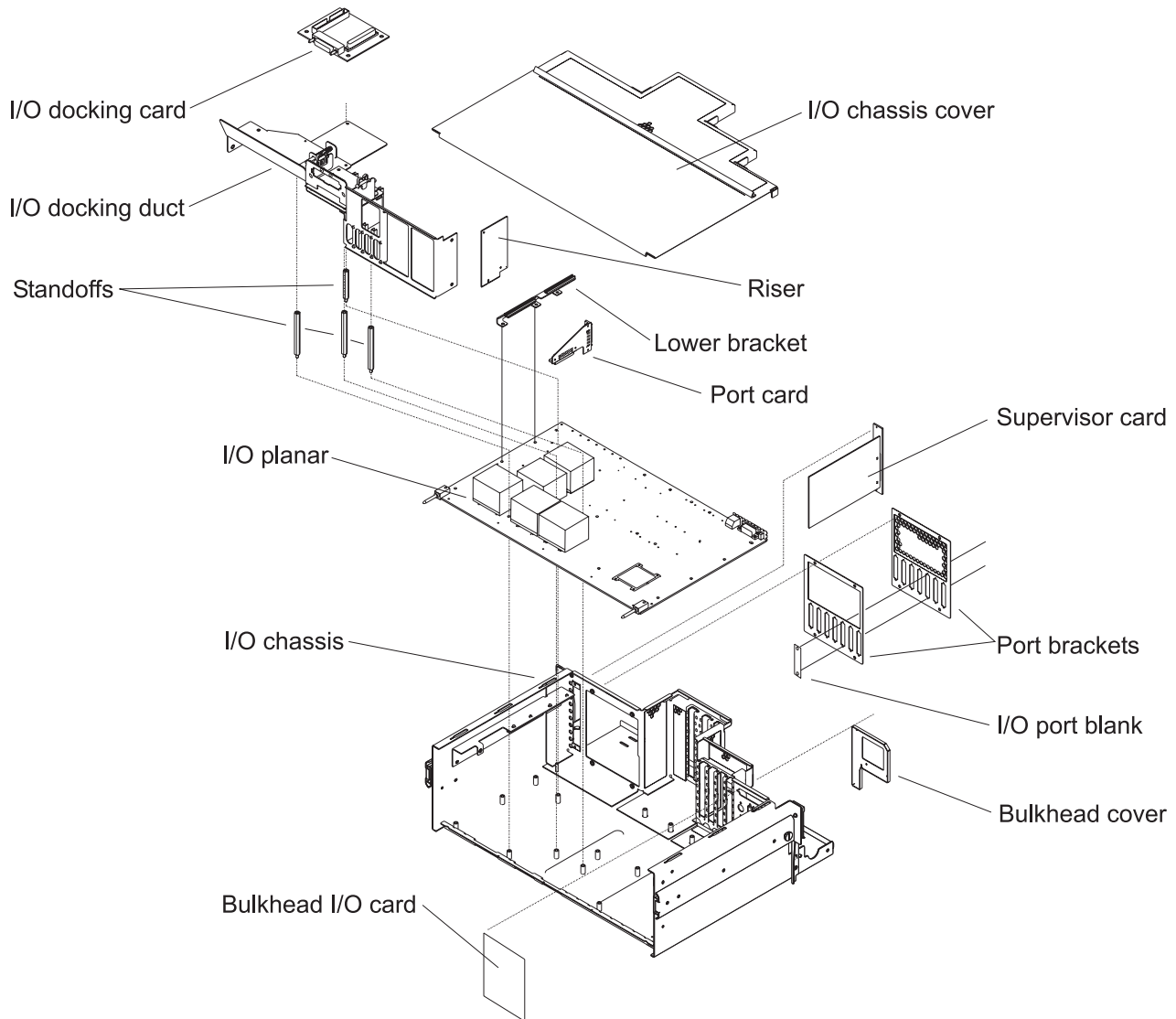
Figure   4-13. POWER3 SMP High Node I/O planar assembly

Replacing the node I/O planar

Attention: Licensed programs frequently rely on network configuration and system information stored on the VPD on the I/O planar (see Figure 2-11 on page 2-13). If the MAPs indicate that the I/O planar should be replaced, swap the VPD from the old I/O planar to the new one. If the old VPD module has to be replaced, call technical support for recovery instructions. If recovery is not possible, notify the system owner that new keys from licensed programs may be required.

Attention: The system ID will change when replacing a High Node I/O planar if keeping the VPD module supplied with the FRU. Inform the Customer, **before** removing and replacing the I/O planar, that some software applications that use the system ID number for licensing purposes may be impacted by this change.

Note: Inform the customer that the boot address will need to be updated. Refer the customer to "Resetting the clock and bootlist after servicing a node" on page 3-16 or *IBM Parallel System Support Programs for AIX: Installation Guide* for this procedure.

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the node I/O planar.
3. Install the screws holding the node I/O planar to the I/O assembly.
4. Install the node supervisor lower card guide bracket to the I/O planar and tighten the screws.
5. Install the air baffle standoffs removed from the old planar.
6. Install the air baffle assembly to the I/O assembly and tighten the screws.
7. Install all the cables connected to the node I/O planar.
8. Install the node supervisor upper card guide bracket to the chassis and tighten the screws.
9. Install the SP Expansion I/O Unit adapters to the node I/O planar.
10. Install the rear panel and tighten the screws.
11. Install the standoffs to secure the SP Expansion I/O Unit adapters.
12. Install the riser card to the I/O planar (at **J9**) and tighten the screw to the upper card guide bracket.
13. Install the node supervisor card, and tighten the screws.
14. Check for any jumpers or switches to be set on the adapters, and set as appropriate.
15. Align adapters, and push into the slots.

    Note: If this card has any internal connections to other adapters or cables, reconnect them, as appropriate

16. Install the SPS MX2 adapter (if present).
17. Install the I/O assembly cover and tighten the screws on the edge of the assembly.
18. Install any SP Expansion I/O Unit cables in the rear of the node.
19. Install any I/O adapter cables in the rear of the node.
20. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
21. Return to the procedure that directed you here.

Removing the circuit breaker assembly

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.
3. Remove the screws on the edge of the power assembly cover. Remove the cover by lifting the front edge while pulling it toward you.
4. Remove the circuit breaker assembly cable from the power planar.
5. Remove the screws that secure the circuit breaker assembly to the power assembly.
6. Remove the circuit breaker assembly.

Replacing the circuit breaker assembly

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the circuit breaker assembly and tighten the screws.
3. Install the circuit breaker assembly cable on the power planar.
4. Install the power assembly cover and tighten the screws on the edge of the assembly.
5. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
6. Return to the procedure that directed you here.

Removing the fan control card

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Ensure the node has been shutdown and powered off before continuing.
3. Set the circuit breaker at the node rear panel in the Off ('0') position.
4. Set the circuit breakers in the 48-volt power cables in the Off ('0') position.
5. Remove the two 48-volt power cables from the rear of the node.
6. Remove the supervisor cable from the node by disconnecting the supervisor bus connector from the supervisor extension cable.
7. If necessary, remove the Ethernet BNC cable from the rear of the processor node.
8. Remove the screws on the edge of the power assembly cover.
9. Remove the cover by lifting the front edge while pulling it toward you.
10. Lift the locking handles to disengage the fan control card.
11. Remove the fan control card.

Replacing the fan control card

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the fan control card.
3. Push down on the locking handles to engage the fan control card.
4. Install the power assembly cover and tighten the screws on the edge of the assembly.
5. If necessary, install the Ethernet BNC cable in the rear of the processor node.
6. Install the supervisor cable to the node by connecting the supervisor bus connector to the supervisor extension cable.
7. Install the two 48-volt power cables in the rear of the node.
8. Set both circuit breakers on the 48-volt power cables in the On ('1') position.
9. Set the circuit breaker on the node rear panel in the On ('1') position.
10. Return to the procedure that directed you here.

Removing a power card

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Ensure the node has been shutdown and powered off before continuing.
3. Set the circuit breaker at the node rear panel in the Off ('0') position.
4. Set the circuit breakers in the 48-volt power cables in the Off ('0') position.
5. Remove the two 48-volt power cables from the rear of the node.
6. Remove the supervisor cable from the node by disconnecting the supervisor bus connector from the supervisor extension cable.
7. If necessary, remove the Ethernet BNC cable from the rear of the processor node.
8. Remove the screws on the edge of the power assembly cover.
9. Remove the cover by lifting the front edge while pulling it toward you.
10. Record the position of any cards to be removed.
11. Lift the locking handles to disengage the power card.
12. Remove the card.
13. Repeat to the previous two steps to remove additional power cards.
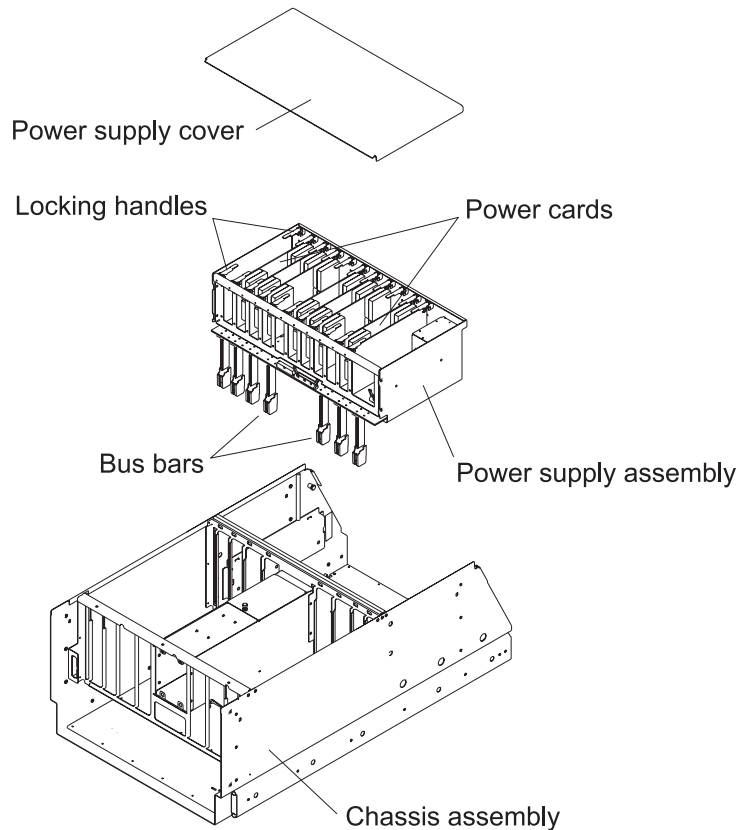
Figure   4-14. POWER3 SMP High Node power card

Replacing a power card

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Align the power card in the slot you previously recorded.
3. Push down on the locking handles to engage the power card.
4. Repeat the previous two steps for additional power cards.
5. Install the power assembly cover and tighten the screws on the edge of the assembly.
6. If necessary, install the Ethernet BNC cable in the rear of the processor node.
7. Install the supervisor cable to the node by connecting the supervisor bus connector to the supervisor extension cable.
8. Install the two 48-volt power cables in the rear of the node.
9. Set both circuit breakers on the 48-volt power cables in the On ('1') position.
10. Set the circuit breaker on the node rear panel in the On ('1') position.
11. Return to the procedure that directed you here.

Removing the power planar

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing a POWER3 SMP High Node into the service position" on page 3-15 to place the node in service state.

3. Refer to "Removing the system planar" on page 4-15 to uncam the system planar from the power bus bars.
4. Remove the screws on the edge of the power assembly cover. Remove the cover by lifting the front edge while pulling it toward you.
5. Record the position of any cards to be removed.
6. Lift the locking handles to disengage the power card.
7. Remove the card.
8. Repeat to the previous two steps to remove additional power cards.
9. Lift the locking handles to disengage the fan control card.
10. Remove the fan control card.
11. Disconnect all cables plugged into the power planar.
12. Remove the screws on the side of the node that secure the power assembly.
13. Tilt the rear of the power chassis down and lift it from the node.
14. Remove the screws that hold the power planar to the power chassis.
15. Remove the power planar.
16. Remove the bus bars from the front edge of the power planar (retain for use on the new power planar).
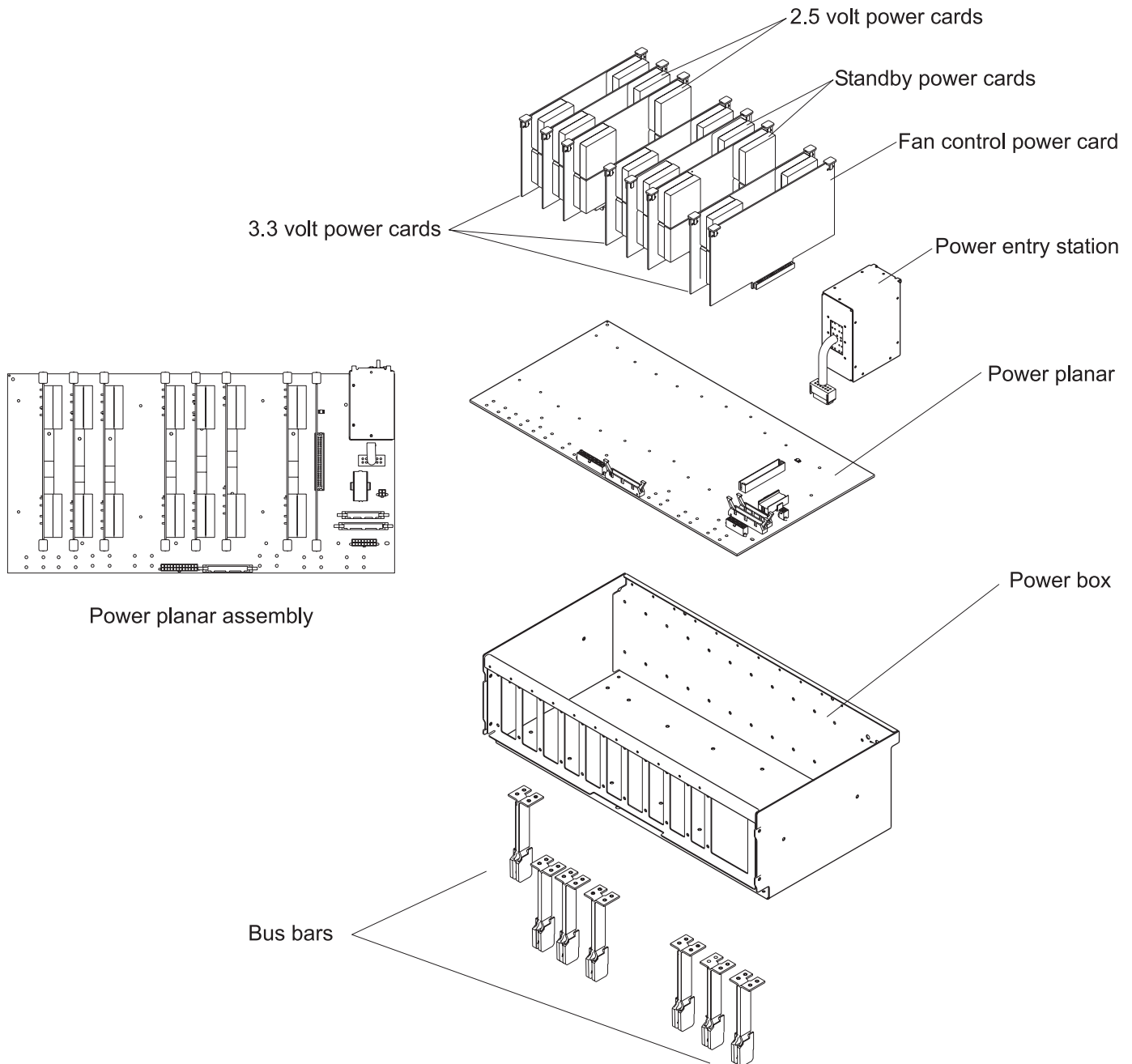
Figure 4-15. POWER3 SMP High Node power planar

Replacing the power planar

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the bus bars to the front edge of the power planar.
3. Install the power planar and tighten the screws to secure it to the chassis.
4. Install the power chassis. Tilt the rear of the chassis toward you and insert it with the bus bars, at that angle, toward the front of the node. Then lift the rear of the power chassis to level.
5. Install the screws on the side of the node to secure the power chassis.

6. Reconnect all cables to the power planar.
7. Align the fan control card in the slot, and push down on the locking handles to engage the card.
8. Align each power card in its slot (as previously recorded) and push down on the locking handles to engage each card.
9. Install the power assembly cover and tighten the screws on the edge of the assembly.
10. Refer to "Replacing the system planar" on page 4-16 to install the system planar and processor assembly FRUs.
11. Refer to "Removing a POWER3 SMP High Node from the service position" on page 3-16 to place the node in usable state.
12. Return to the procedure that directed you here.

Procedures for SP Expansion I/O Units

These procedures cover the removal and replacement of the SP Expansion I/O Unit components.

Removing and replacing FRUs with power on

Some FRUs may be removed and replaced with the power on (hot-swappable FRUs). The removal and replacement procedures identify parts that can be hot swapped.
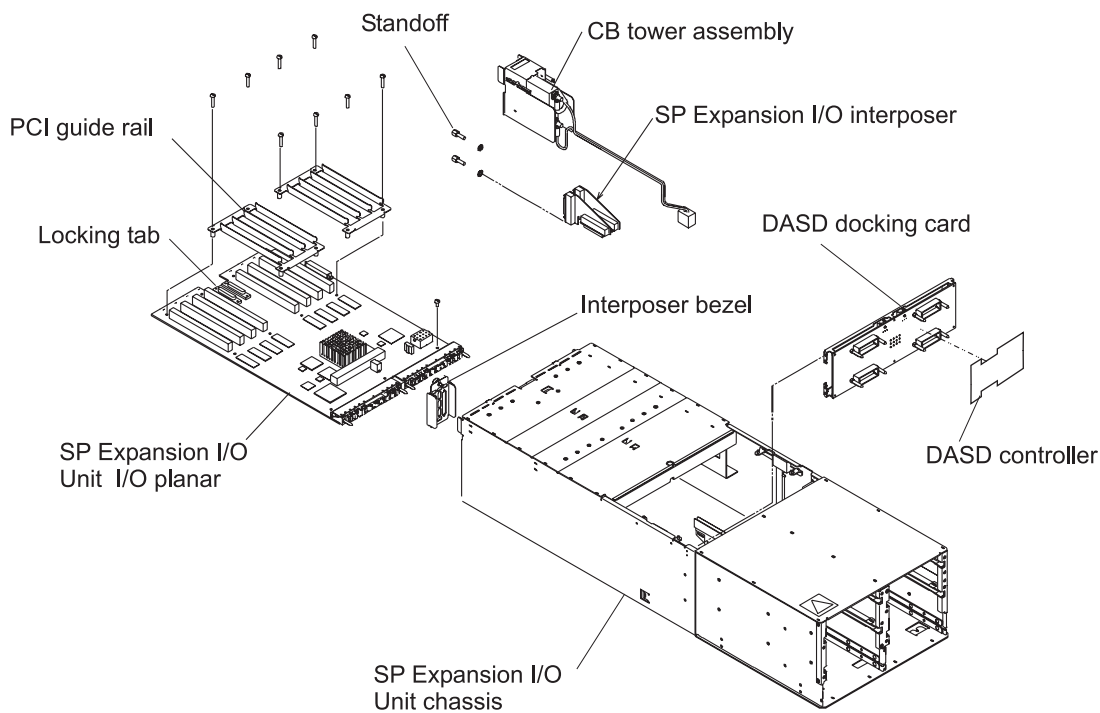
Figure 4-16. SP Expansion I/O Unit high level component diagram (1 of 2)
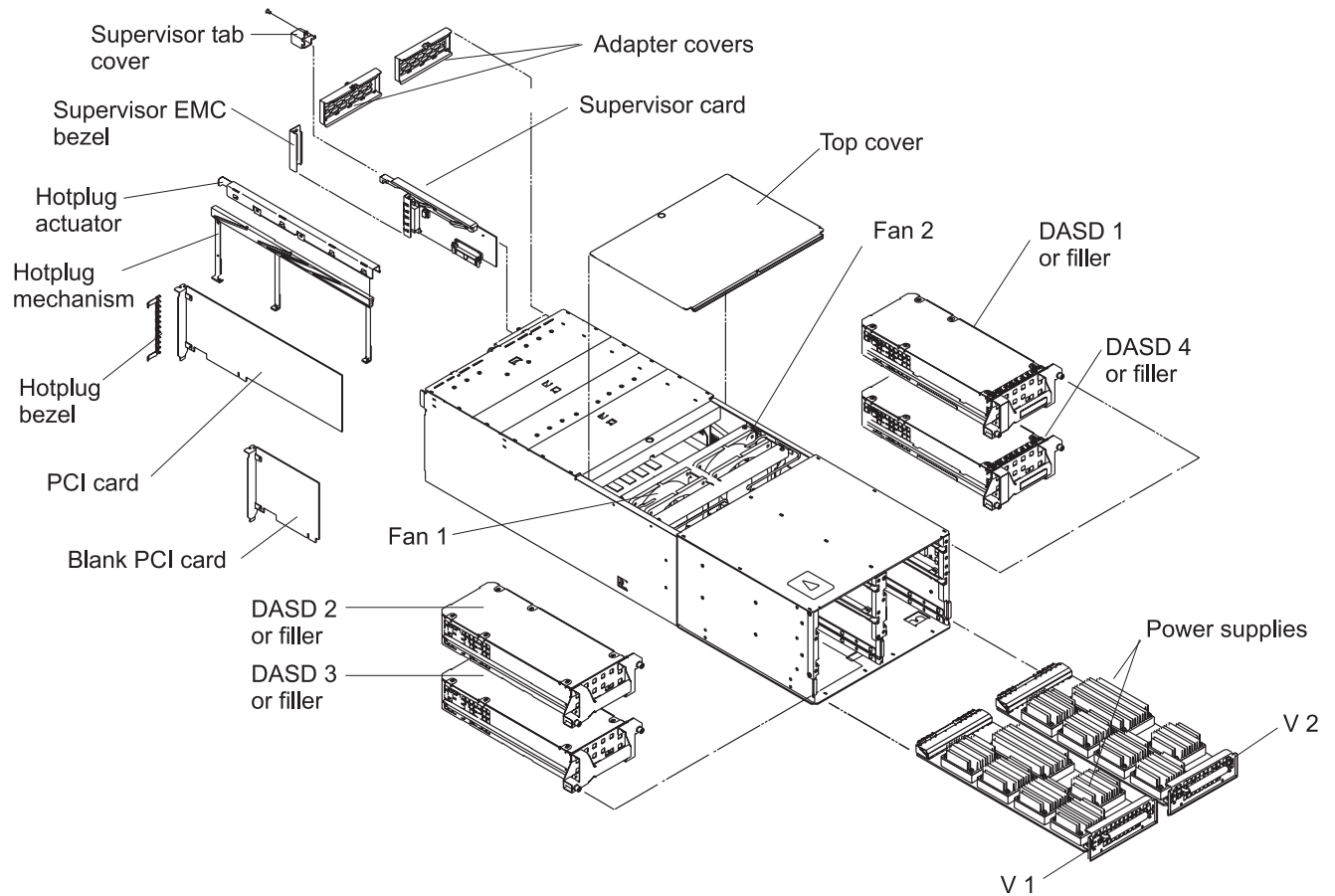
Figure   4-17. SP Expansion I/O Unit high level component diagram (2 of 2)

Removing a fan

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing an SP Expansion I/O Unit into the service position" on page 3-16 to place the SP Expansion I/O Unit in service state.
3. Remove the center cover plate by unlocking the screw and lifting the cover from the unit.
4. Unplug the fan assembly power cables and remove the fan assembly.
5. Slide the fan out of the assembly.
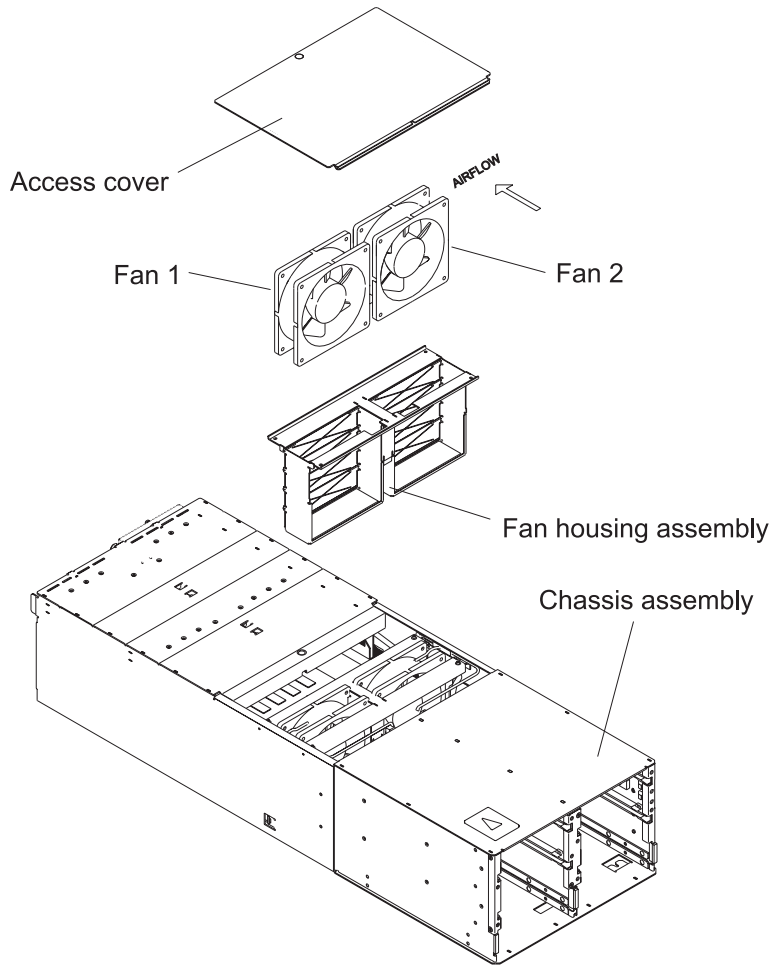
Figure   4-18. SP Expansion I/O Unit fan

Replacing a fan

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Slide the fan into the fan assembly with the flow indicator arrow is pointing toward the louvers.
3. Lower the fan assembly into the unit with the louvers toward the rear of the unit.
4. Align fan assembly on the locator pins.
5. Replug the fan assembly power cables.
6. Install the center cover plate and tighten the locking screw.
7. Refer to "Removing an SP Expansion I/O Unit from the service position" on page 3-16 to place the SP Expansion I/O Unit in usable state.
8. Return to the procedure that directed you here.

Removing internal SCSI or internal SSA cables

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing an SP Expansion I/O Unit into the service position" on page 3-16 to place the unit in service state.
3. Remove the center cover plate by unlocking the screw and lifting the cover from the unit.
4. Unplug the fan assembly power cables and remove the fan assembly.

5. Remove the screws holding the SSA cable to the DASD docking card.
6. Remove the DASD SCSI cable from the DASD docking card.
7. Remove the screws holding the cable retainer to the chassis wall.
8. Remove the screw holding the supervisor card cover plate and remove the cover plate.
9. Remove the screw holding the cable plate (for both SCSI and SSA cables) to the rear panel.
10. Remove either the SCSI cable or SSA cable assembly by pulling it out towards the rear panel.
11. Remove the standoffs to disconnect the cables from the plate.

Replacing internal SCSI or internal SSA cables

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the standoffs to connect the cables to the plate.
3. Install either the SCSI or the SSA cable assembly in the rear panel.
4. Tighten the screw holding the cable plate (for both SCSI and SSA cables) to the rear panel.
5. Tighten the screw holding the supervisor card cover plate.
6. Install the DASD SCSI cable to the DASD docking card.
7. Install the cable retainer to the chassis wall and tighten the screws.
8. Tighten the screws holding the SSA cable to the DASD docking card.
9. Lower the fan assembly into the unit with the louvers toward the rear of the unit.
10. Align fan assembly on the locator pins.
11. Replug the fan assembly power cables.
12. Install the center cover plate and tighten the locking screw.
13. Refer to "Removing an SP Expansion I/O Unit from the service position" on page 3-16 to place the SP Expansion I/O Unit in usable state.
14. Return to the procedure that directed you here.

Removing the circuit breaker and power cable

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing an SP Expansion I/O Unit into the service position" on page 3-16 to place the unit in service state.
3. Remove the center cover plate by unlocking the screw and lifting the cover from the unit.
4. Unplug the fan assembly power cables and remove the fan assembly.
5. Unplug the circuit breaker and power cable at J13 on the I/O planar.
6. Remove the I/O adapter cards on either side of the circuit breaker tower (see "Removing a PCI adapter card" on page 4-41).
7. Remove the standoffs holding the 48-volt input connector to the rear panel.
8. Remove the screws holding the circuit breaker to the rear panel.
9. Unlace the power cable from the top of the chassis.
10. Remove the circuit breaker and power cable.

Replacing the circuit breaker and power cable

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the circuit breaker and power cable in the rear panel.
3. Lace the power cable to the top of the chassis.
4. Tighten the screws holding the circuit breaker to the rear panel.
5. Tighten the standoffs holding the 48-volt input connector to the rear panel.

6. Install the I/O adapter cards removed on either side of the circuit breaker tower (see "Replacing a PCI adapter card" on page 4-43).
7. Plug the circuit breaker power cable to J13 on the I/O planar.
8. Lower the fan assembly into the unit with the louvers toward the rear of the unit.
9. Align fan assembly on the locator pins.
10. Replug the fan assembly power cables.
11. Install the center cover plate and tighten the locking screw.
12. Refer to "Removing an SP Expansion I/O Unit from the service position" on page 3-16 to place the SP Expansion I/O Unit in usable state.
13. Return to the procedure that directed you here.

Removing a power supply

Note: Power supplies in the SP Expansion I/O Unit are hot-swappable. They can be removed and replaced with the power on.

Note: To maintain power to the unit, one power card with a green (power) LED lit must remain in the SP Expansion I/O Unit at all times.

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. To remove FRU:

   - With power on:

     a. Pull the power supply latching handle down and disengage the power supply by pulling it out using the handle.

   - With power off:

     a. Refer to "Placing an SP Expansion I/O Unit into the service position" on page 3-16 to place the SP Expansion I/O Unit in service state.

     b. Pull the power supply latching handle down and disengage the power supply by pulling it out using the handle.

Replacing a power supply

Note: Power supplies in the SP Expansion I/O Unit are hot-swappable. They can be removed and replaced with the power on.

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. To remove FRU:

   - With power on:

     a. Push the power supply into the SP expansion I/O unit and lift the latching handle to engage the power supply.

        Note: Observe the green (power) LED for ten seconds after inserting the power card and make certain LED remains lit.

   - With power off:

     a. Refer to "Removing an SP Expansion I/O Unit from the service position" on page 3-16 to place the SP Expansion I/O Unit in usable state.

     b. Push the power supply into the SP expansion I/O unit and lift the latching handle to engage the power supply.

3. Return to the procedure that directed you here.

Removing the LED cable

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing an SP Expansion I/O Unit into the service position" on page 3-16 to place the SP Expansion I/O Unit in service state.
3. Record the location of any DASD adapter cables and DASD you are removing, for later installation.
4. Loosen the screws holding the DASDs on the right side of the SP Expansion I/O unit.
5. Using the handle, pull each DASD assembly to remove it from the unit.
6. Unplug the LED cable at the rear of the LED card.
7. Remove the center cover plate by unlocking the screw, and lifting it clear.
8. Unplug the LED cable at J14 on the I/O planar.
9. Remove the screws holding the cable retainer to the chassis wall.
10. Remove the LED cable.

Replacing the LED cable

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Route the cable in the position from which it was previously removed.
3. Install the LED cable at planar position J14.
4. Plug the LED cable at the rear of the LED card.
5. Install the cable retainer and tighten the screws.
6. Install the center cover plate and tighten the locking screw.
7. Push the DASD assembly into the unit, engaging the assembly.
8. Tighten the screws.
9. Refer to "Removing an SP Expansion I/O Unit from the service position" on page 3-16 to place the SP Expansion I/O Unit in usable state.
10. Return to the procedure that directed you here.

Removing the LED card

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing an SP Expansion I/O Unit into the service position" on page 3-16 to place the SP Expansion I/O Unit in service state.
3. Loosen the screws holding the DASDs on the right side of the SP Expansion I/O unit.
4. Using the handle, pull each DASD assembly to remove it from the unit.
5. Remove the screws holding the LED card to the side of the chassis.
6. Remove the card, and unplug the LED cable.

Replacing the LED card

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Plug the LED cable in the LED card.
3. Install the LED card and tighten the screw
4. Push the DASD assembly into the unit, engaging the assembly.
5. Tighten the screws.

6. Refer to "Removing an SP Expansion I/O Unit from the service position" on page 3-16 to place the SP Expansion I/O Unit in usable state.
7. Return to the procedure that directed you here.

Removing the DASD power cable

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing an SP Expansion I/O Unit into the service position" on page 3-16 to place the unit in service state.
3. Remove the center cover plate by unlocking the screw and lifting the cover from the unit.
4. Unplug the fan assembly power cables and remove the fan assembly.
5. Unplug the DASD power cable at J50 on the I/O planar.
6. Unplug the DASD power cable at J5 on the DASD docking card.
7. Remove the tie wraps that secure the cable.
8. Remove the cable.

Replacing the DASD power cable

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the DASD power cable at J5 on the DASD docking card.
3. Plug the DASD power cable at J50 on the I/O planar.
4. Lower the fan assembly into the unit with the louvers toward the rear of the unit.
5. Align fan assembly on the locator pins.
6. Replug the fan assembly power cables.
7. Install the center cover plate and tighten the locking screw.
8. Refer to "Removing an SP Expansion I/O Unit from the service position" on page 3-16 to place the SP Expansion I/O Unit in usable state.
9. Return to the procedure that directed you here.

Removing a SCSI DASD

Note: You do not have to power down the system to remove a hot-swap drive assembly from the SP Expansion I/O Unit. Before you perform these procedures, ensure that the customer has taken the appropriate actions to backup the data for the drive you are removing, and that the drive has been removed from the configuration. Physically removing a hot-swap drive before it has been removed from the system configuration, may cause unrecoverable data corruption.

Note: If the DASD device is a SCSI unit, the "Identify and Remove Resource" Service Aid may be used to identify devices located in SP Expansion I/O Units. Refer to "Servicing SP Expansion I/O Unit SCSI devices (SES)" on page 3-22 for more information.

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. To replace FRU:

   - With power off:

     a. Refer to "Placing an SP Expansion I/O Unit into the service position" on page 3-16 to place the SP Expansion I/O Unit in service state.

     b. Loosen the screws holding the DASD to the SP Expansion I/O Unit.

     c. Using the handle, pull the DASD assembly to remove it from the unit.

- With power on:

    a. If you are hot-plugging an SP Expansion I/O Unit DASD, make certain it has been varied offline by the customer's system administrator.

    b. Get DASD slot location and SESx information from the system administrator

    c. Locate DASD slot using the "Identify" option in the Service Aid menu (yellow disk status LED blinks)

    d. Put the DASD slot in "Removal" state using the service aid menus

    e. Continue removal procedure **only if** the disk LEDs show:

        – Status (yellow) on

        – Power (green) on

        – Activity (green) off

    f. Loosen the screws holding the DASD to the SP Expansion I/O Unit.

    g. Using the handle, pull the DASD assembly to remove it from the unit.

Replacing a SCSI DASD

Note: If the DASD device is a SCSI unit, the "Identify and Remove Resource" Service Aid may be used to identify devices located in SP Expansion I/O Units. Refer to "Servicing SP Expansion I/O Unit SCSI devices (SES)" on page 3-22 for more information.

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. To replace the FRU:

    - With power on:

        a. Put the DASD slot in "Insert" state using the service aid menus

        b. Push the DASD assembly into the unit, engaging the assembly.

        c. Tighten the screws.

        d. Continue installation procedure **only if** the disk LEDs show:

            – Status (yellow) on

            – Power (green) on

            – Activity (green) on

        e. Place the DASD slot into "Normal" state using the service aid menus (Disk status LED (yellow) goes out).

        f. If you are working with an SP Expansion I/O Unit DASD that has been varied offline for hot-plugging, it **must** be varied back online by the customer's system administrator.

    - With power off:

        a. Push the DASD assembly into the unit, engaging the assembly.

        b. Tighten the screws.

        c. Refer to "Removing an SP Expansion I/O Unit from the service position" on page 3-16 to place the SP Expansion I/O Unit in usable state.

3. Return to the procedure that directed you here.

Removing an SSA DASD

Note: You do not have to power down the system to remove a hot-swap drive assembly from the SP Expansion I/O Unit. Before you perform these procedures, ensure that the customer has taken the appropriate actions to backup the data for the drive you are removing, and that the drive has been removed from the configuration. Physically removing a hot-swap drive before it has been removed from the system configuration, may cause unrecoverable data corruption.

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. To replace FRU:
   - With power off:
     a. Refer to "Placing an SP Expansion I/O Unit into the service position" on page 3-16 to place the SP Expansion I/O Unit in service state.
     b. Loosen the screws holding the DASD to the SP Expansion I/O Unit.
     c. Using the handle, pull the DASD assembly to remove it from the unit.
   - With power on:
     a. Refer to Chapter 10 in the *SSA User's Guide*(SA33–3272).

Replacing an SSA DASD

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. To replace the FRU:
   - With power off:
     a. Push the DASD assembly into the unit, engaging the assembly.
     b. Tighten the screws.
     c. Refer to "Removing an SP Expansion I/O Unit from the service position" on page 3-16 to place the SP Expansion I/O Unit in usable state.
   - With power on:
     a. Refer to Chapter 10 in the *SSA User's Guide*(SA33–3272).
3. Return to the procedure that directed you here.
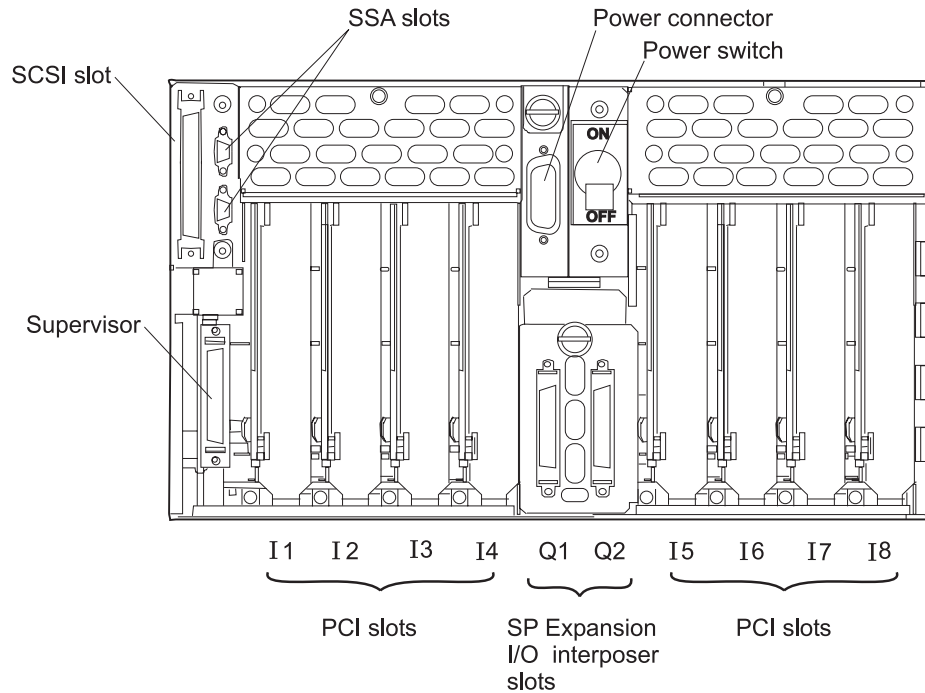
Figure   4-19. SP Expansion I/O Unit PCI adapter cards

Removing a PCI adapter card

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing an SP Expansion I/O Unit into the service position" on page 3-16 to place the SP Expansion I/O Unit in service state.
3. Remove the I/O adapter cover plate by loosening the screws and lifting it from the unit.
4. Check for internal connections to other adapter cards or cables. Record these connections before removing any cards.
5. Unseat the adapter by pulling the adapter card release tab at the top of the card. Then remove the card by pulling it toward you.
6. Record any appropriate jumper or switch settings on the card.

Expansion unit procedures
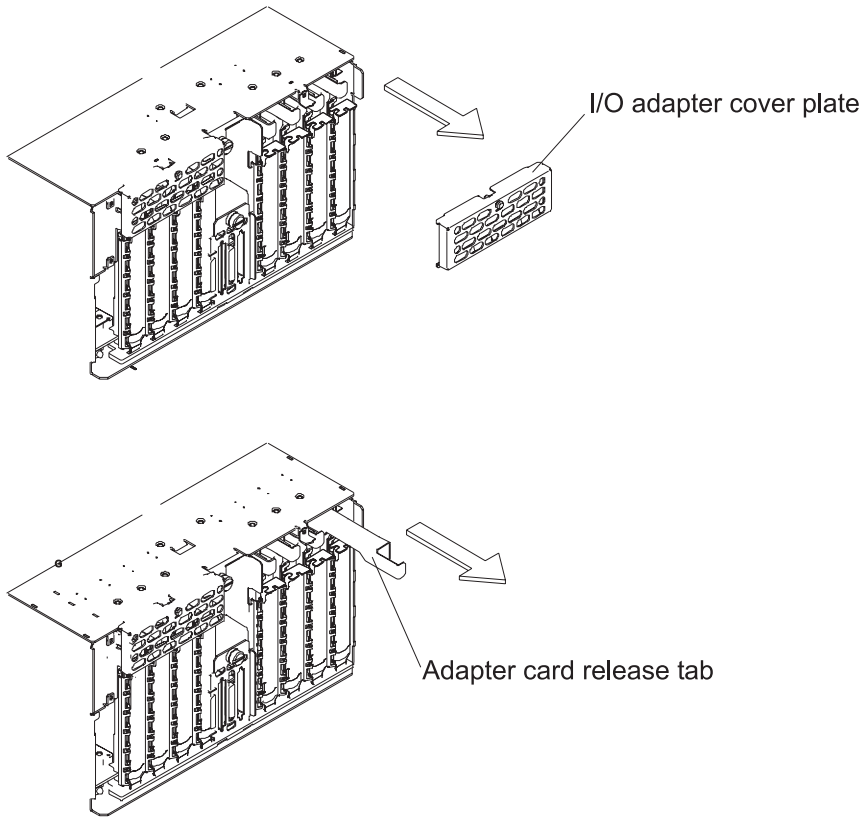
Figure 4-20. Removing PCI adapter cards from the SP Expansion I/O Unit
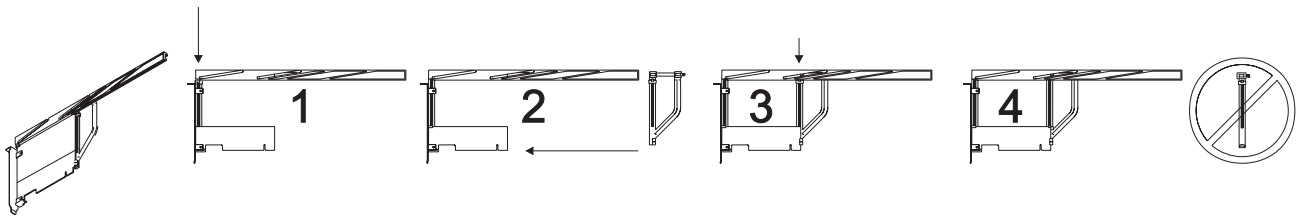
Figure 4-21. Replacing short PCI adapter cards
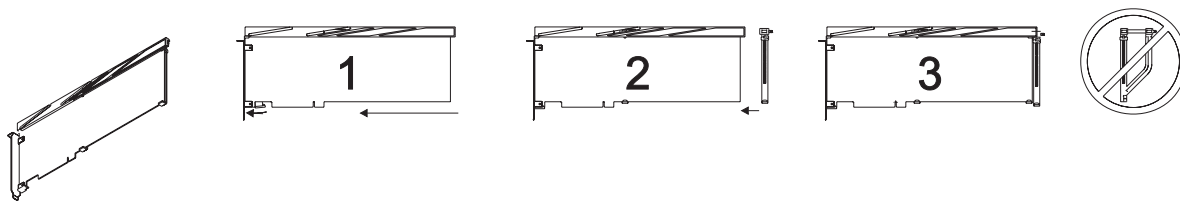
Figure 4-22. Replacing long PCI adapter cards

Replacing a PCI adapter card

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Set any jumpers or switches on this card, as appropriate.
3. If this card has any internal connections to other adapters or cables, reconnect them, as appropriate.
4. Slide the adapter into the unit and align the card with the planar connector.
5. Push the adapter card release tab to seat the adapter.
6. Install the I/O adapter cover plate and tighten the screw.
7. Refer to "Removing an SP Expansion I/O Unit from the service position" on page 3-16 to place the SP Expansion I/O Unit in usable state.
8. Return to the procedure that directed you here.

Removing the supervisor card

Note: The supervisor card in the SP Expansion I/O Unit is hot-swappable. It can be removed and replaced with the power on. However, if the yellow LED on the supervisor card is lit, the supervisor card **should not** be hot-swapped.

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Remove the supervisor cable from the supervisor card.
3. Remove the supervisor cover plate by removing the screw and lifting it from the unit.
4. Unseat the card by pulling the supervisor card release tab at the top of the card. Then remove the card by pulling it toward you.

Replacing the supervisor card

Note: The supervisor card in the SP Expansion I/O Unit is hot-swappable. It can be removed and replaced with the power on.

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Slide the supervisor card into the unit and align the card with the planar connector.
3. Push the supervisor card release tab to seat the adapter.

   • Do not force the card into position.

4. Install the supervisor card cover plate and tighten the screw.
5. Install the supervisor cable to the supervisor card.

   • Yellow LED blinks indicate the frame slot address.

6. Return to the procedure that directed you here.

Removing the DASD docking card (SES)

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing an SP Expansion I/O Unit into the service position" on page 3-16 to place the SP Expansion I/O Unit in service state.
3. Loosen the screws holding the DASD to the SP Expansion I/O Unit.
4. Using the DASD handle, pull the DASD assembly to remove it from the unit.
5. Remove the center cover plate by unlocking the screw and lifting the cover from the unit.

6. Unplug the fan assembly power cables and remove the fan assembly.
7. Remove the cables attached to the docking card.
8. Remove the docking card mounting screws and lift the docking card out of the unit.

Replacing the DASD docking card (SES)

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Slide the docking card into the SP expansion I/O unit and tighten the screws.
3. Install the cables that attach to the docking card.
4. Lower the fan assembly into the unit with the louvers toward the rear of the unit.
5. Align fan assembly on the locator pins.
6. Replug the fan assembly power cables.
7. Install the center cover plate and tighten the locking screw.
8. Push the DASD assembly into the unit, engaging the assembly.
9. Tighten the screws.
10. Refer to "Removing an SP Expansion I/O Unit from the service position" on page 3-16 to place the SP Expansion I/O Unit in usable state.
11. Return to the procedure that directed you here.

Removing the DASD controller (SES)

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Removing the DASD docking card (SES)" on page 4-43 to remove the DASD docking card.
3. Remove the DASD controller by unplugging it from the DASD docking card at J10.

Replacing the DASD controller (SES)

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Plug the DASD controller into the DASD docking card at J10.
3. Refer to "Replacing the DASD docking card (SES)" to replace the DASD docking card.
4. Refer to "Removing an SP Expansion I/O Unit from the service position" on page 3-16 to place the SP Expansion I/O Unit in usable state.
5. Return to the procedure that directed you here.

Removing an SP expansion I/O interposer

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing an SP Expansion I/O Unit into the service position" on page 3-16 to place the SP Expansion I/O Unit in service state.
3. Record the location of any I/O adapter cables and cards you are removing for later installation.
4. If necessary, remove the PCI adapter cards on either side of the SP expansion I/O interposer (see "Removing a PCI adapter card" on page 4-41).
5. Label and remove both I/O interposer loop cables (external cables attached to the SP expansion I/O interposer).
6. Remove the SP expansion I/O interposer standoffs.
7. Loosen the top screw of the cover plate and remove the plate.
8. Remove the SP expansion I/O interposer.
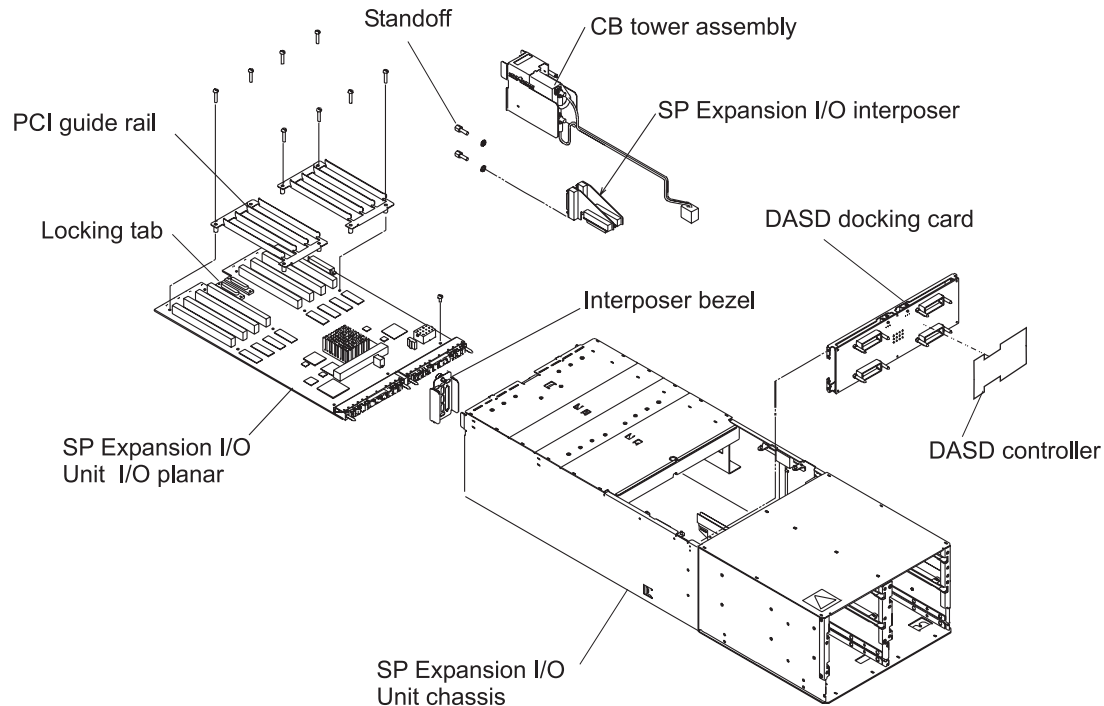
Figure 4-23. SP expansion I/O interposer

Replacing an SP expansion I/O interposer

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the SP expansion I/O interposer.
3. Install the cover plate and tighten the screw.
4. Install and tighten the SP expansion I/O interposer standoffs.
5. Install both I/O interposer loop cables.
6. If necessary, install the I/O adapter cards removed on either side of the SP expansion I/O interposer (see "Replacing a PCI adapter card" on page 4-43).
7. Refer to "Removing an SP Expansion I/O Unit from the service position" on page 3-16 to place the SP Expansion I/O Unit in usable state.
8. Return to the procedure that directed you here.

Removing the I/O planar

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Refer to "Placing an SP Expansion I/O Unit into the service position" on page 3-16 to place the SP Expansion I/O Unit in service state.
3. Record the location of any I/O adapter cables and cards you are removing for later installation.
4. Remove all PCI adapter cards (see "Removing a PCI adapter card" on page 4-41).
5. Remove the supervisor card (see "Removing the supervisor card" on page 4-43).
6. Remove the SP expansion I/O interposers (see "Removing an SP expansion I/O interposer" on page 4-44).
7. Pull down on the power supply handles to disengage both of the power supplies from the I/O planar.
8. Remove the center cover plate by unlocking the screw and lifting the cover from the unit.
9. Unplug the fan assembly power cables and remove the fan assembly.
10. Unplug the cables attached to the I/O planar at J13, J14 and J50.

11. Push up on the locking tab located in the center of the I/O planar and pull the planar toward you.
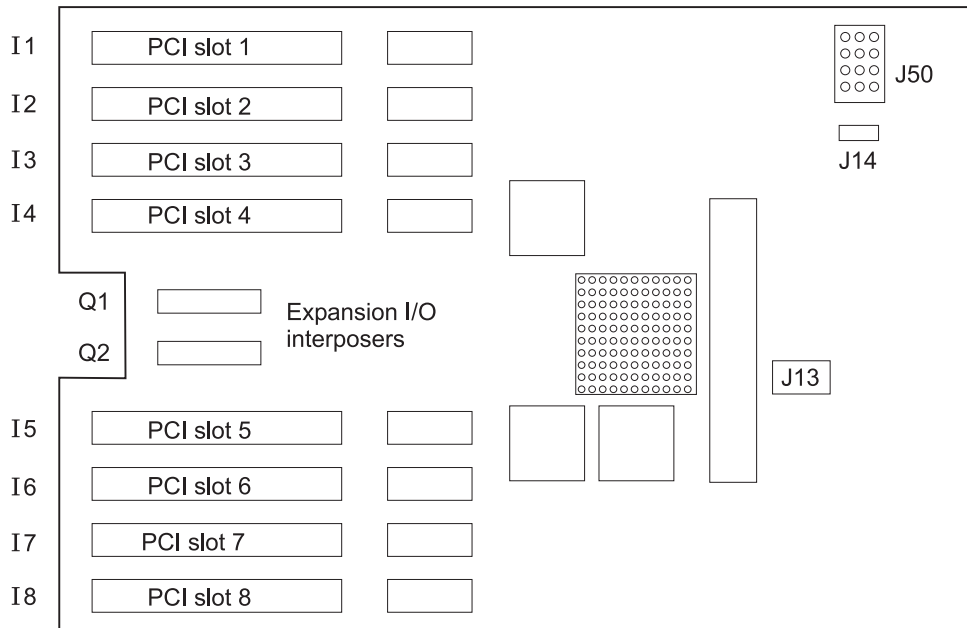
Figure   4-24. SP Expansion I/O Unit I/O planar locations

Replacing the I/O planar

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the I/O planar and push it into the unit until it locks into position.
3. Plug the cables attached to the I/O planar at J13, J14 and J50.
4. Lower the fan assembly into the unit with the louvers toward the rear of the unit.
5. Align fan assembly on the locator pins.
6. Replug the fan assembly power cables.
7. Install the center cover plate and tighten the locking screw.
8. Push the power supplies into the unit and engage each supply by lifting on the latching handle.
9. Install the SP expansion I/O interposers (see "Replacing an SP expansion I/O interposer" on page 4-45).
10. Install the supervisor card (see "Replacing the supervisor card" on page 4-43).
11. Install all PCI adapters that were removed (see "Replacing a PCI adapter card" on page 4-43).
12. Refer to "Removing an SP Expansion I/O Unit from the service position" on page 3-16 to place the SP Expansion I/O Unit in usable state.
13. Return to the procedure that directed you here.

Chapter 5. Parts catalog

This chapter presents the Parts Catalog listing of RS/6000 SP POWER3 SMP High Node and SP Expansion I/O Unit parts and FRUs, with corresponding figures containing indexed descriptions.

Assembly 1: POWER3 Symmetric MultiProcessor (SMP) High Node asm (view 1)
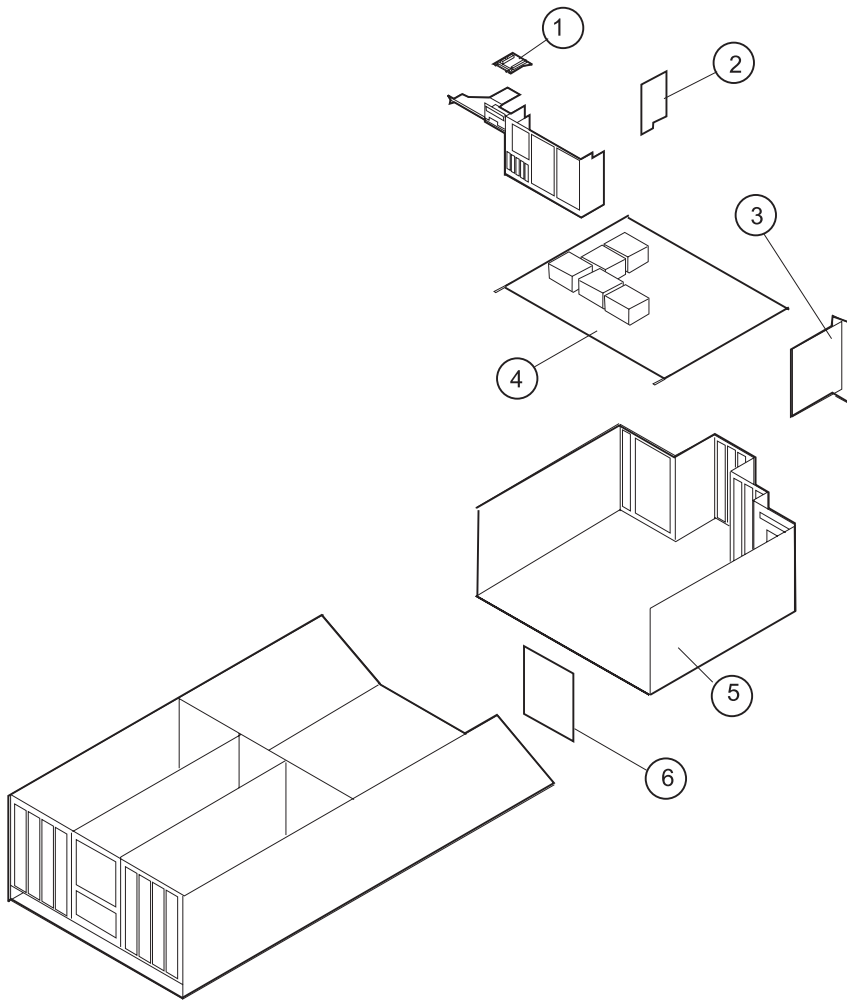
Asm– Index	Part Number	Units	Description
1–5			I/O Assembly (reference only)
–1	41L6350	1	• Card, I/O Docking
–2	30L6128	1	• Card, Pico Riser,
–3	05N5775	1	• Card, Node Supervisor (Pico)
–4	11K0571	1	• Planar, Node I/O
–6	30L5871	1	• Card, Bulkhead (supervisor, network, etc. connection)
–7	11J6537	6	• Cards, SP Expansion I/O Unit Interposer
–	31L7736	1	• Adapter, SPS MX2 (not shown)
–		AR	• Cards, PCI (reference only-not shown)
–	41L5044	1	• Cable, SCSI-to-Docking Card (not shown)
–	07L8604	1	• Cable, I/O Signal (I/O Planar to Docking Card) (not shown)
–	41L5043	1	• Cable, I/O Power (not shown)
–	07L8608	1	• Cable, Signal 1 (I/O Planar to Bulkhead Card) (not shown)
–	07L8609	1	• Cable, Signal 2 (not shown)
–	41L5051	1	• Cable, I/O Signal (Power Backplane to Docking Card) (not shown)

Assembly 2: POWER3 Symmetric MultiProcessor (SMP) High Node asm (view 2)

Processor Assembly
(Front half of node chassis)
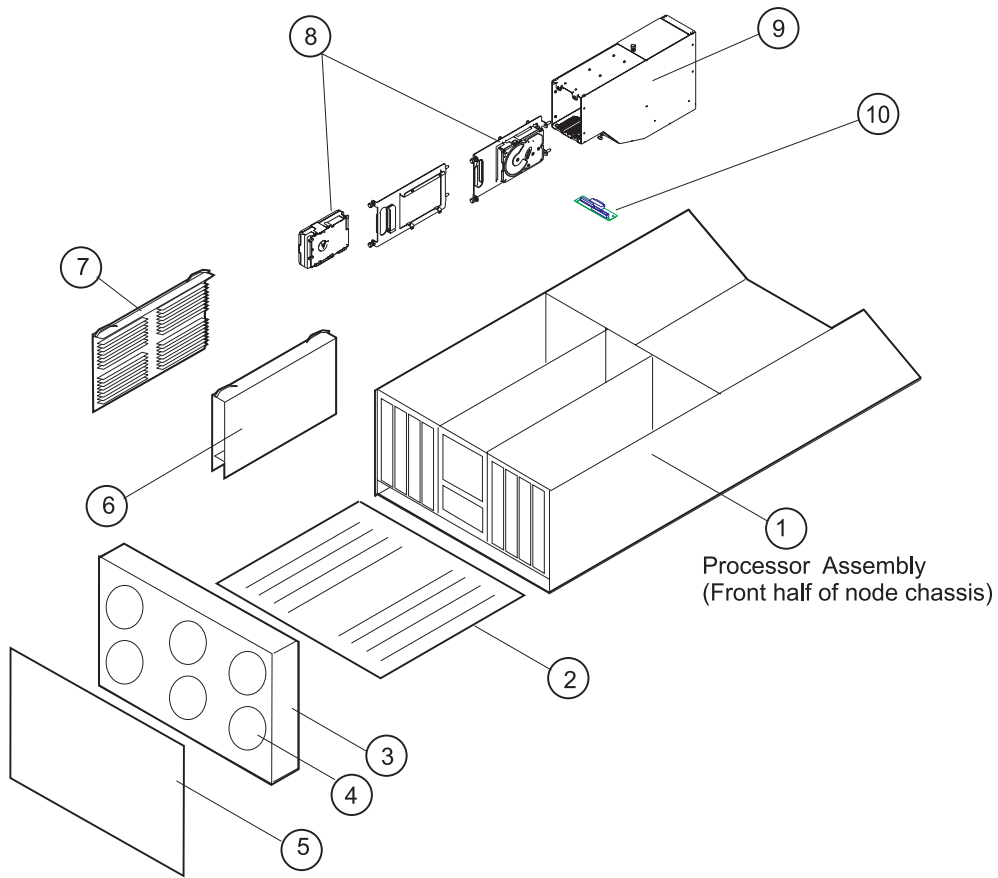
Asm–Index	Part Number	Units	Description
2–1			Processor Assembly (reference only)
–2	03N4184	1	Planar, System
–3			Cooling Assembly (reference only)
–4	07L8594	6	• Fan (172 mm)
–5	31L8712	1	Filter Cover
–6	41L6153	AR	Card, Processor (2-way CPU)
–7	07L6608	AR	Cards, Memory (reference only)
–	93H4702	AR	DIMM, 128 MB (See Table 5-2 on page 5-14)
–8			DASD Units
–	59H6926	AR	• DASD, 9.1 GB
–	59H6923	AR	• DASD, 18.2 GB
–9			DASD Tray (reference only)
–10	08L1353	1	Card, Processor Asm Docking
–	41L5044	1	Cable, I/O Signal (Processor Asm Docking Card) (not shown)
–	41L5049	1	Cable, Power (Processor Asm Docking Card) (not shown)
–	03N3667	1	Cable, Power (SCSI/DASD) (not shown)
–	41L5045	1	Cable, Power (Fan/DASD) (not shown)
–	03N3856	1	Cable, Signal, 34-Position (not shown)
–	03N3857	1	Cable, Signal, 26-Position (not shown)
–	41L5046	1	Cable, Power (Processor Power), 16-Position (not shown)

Assembly 3: POWER3 Symmetric MultiProcessor (SMP) High Node asm (view 3)
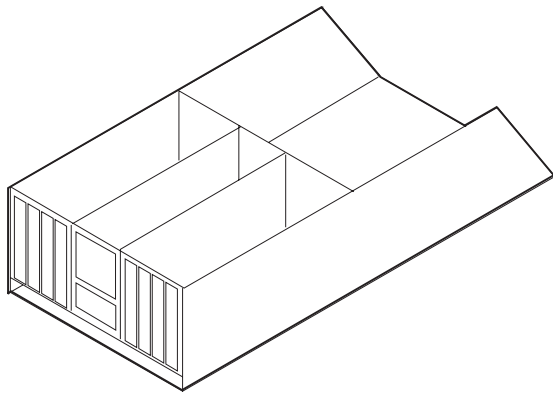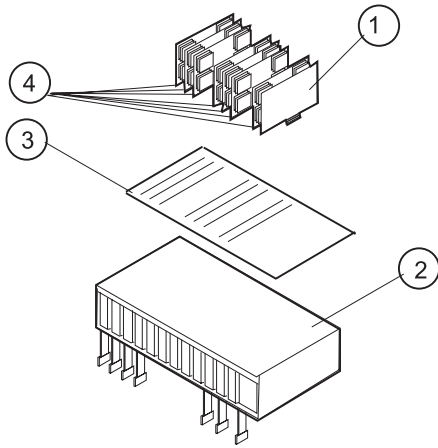
Asm–Index	Part Number	Units	Description
3–2			Power Assembly (reference only)
–1	12K0451	1	• Card, Fan Control
–	21L3085	1	• Power Entry Station
–3	12K0452	1	• Power Backplane
–4	12K0447	3	• Cards, Power (2.5-volt)
–4	12K0448	5	• Cards, Power (3.3-volt)
–4	12K0449	1	• Card, Power (5-volt/12-volt stby)
–4	12K0450	1	• Card, Power (5-volt/–12-volt)

Assembly 4: POWER3 SMP High Node SP Expansion I/O Unit (view 1)
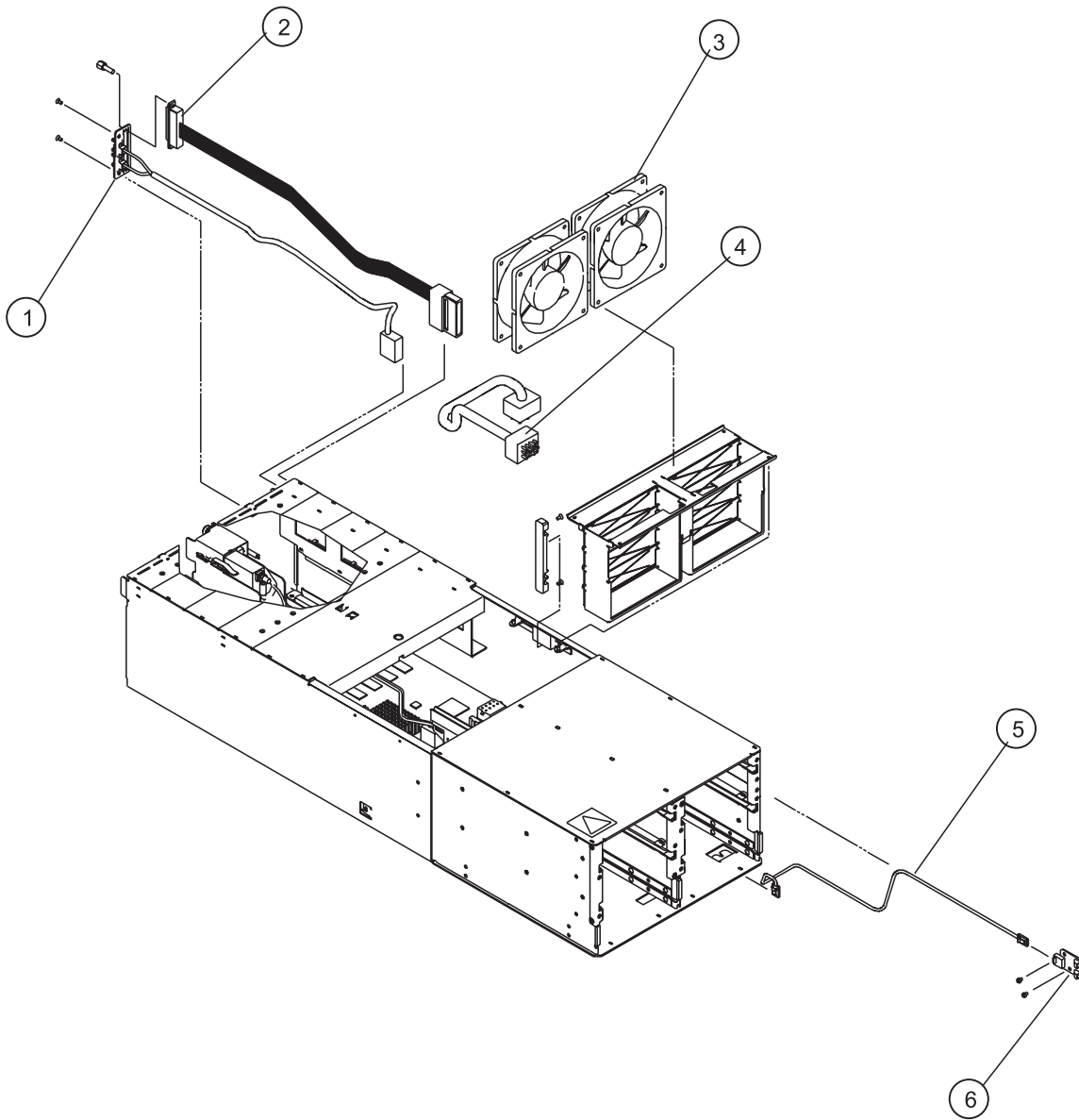
Asm–Index	Part Number	Units	Description
4–1	21L2989	1	Cable, SSA
–2	11J5276	1	Cable, SCSI
–3	11J5275	2	Fans
–4	21L3040	1	Jumper, Power, 12-Position
–5	31L8513	1	Cable, LED
–6	21L3150	1	Card, LED
–	90H9795	AR	Cable, 2 m Attachment (F/C 3126), SP Expansion I/O Unit
–	21H7377	AR	Cable, 15 m Attachment (F/C 3127), SP Expansion I/O Unit
–	31L8497	AR	Cable, SCSI Extender (F/C 1243), SP Expansion I/O Unit
–	31L8498	AR	Cable, SSA Extender (F/C 1244), SP Expansion I/O Unit

Assembly 5: POWER3 SMP High Node SP Expansion I/O Unit (view 2)

SP Expansion I/O
Unit Chassis
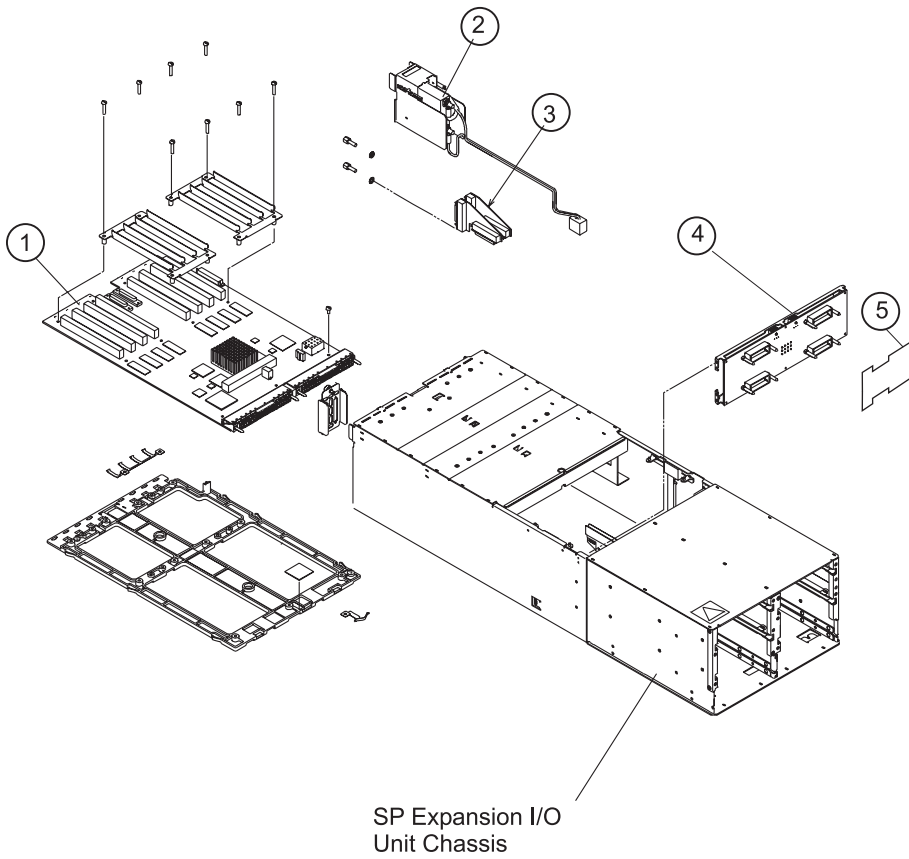
Asm–Index	Part Number	Units	Description
5–1	05N5005	1	Planar
–2	31L7820	1	CB Tower
–3	11J6537	1	Card, Interposer
–	05N4971	1	Planar Assembly, DASD
–4	05N4972	1	• DASD Docking Card
–5	12K0503	1	• DASD Controller

Assembly 6: POWER3 SMP High Node SP Expansion I/O Unit (view 3)

Top Cover
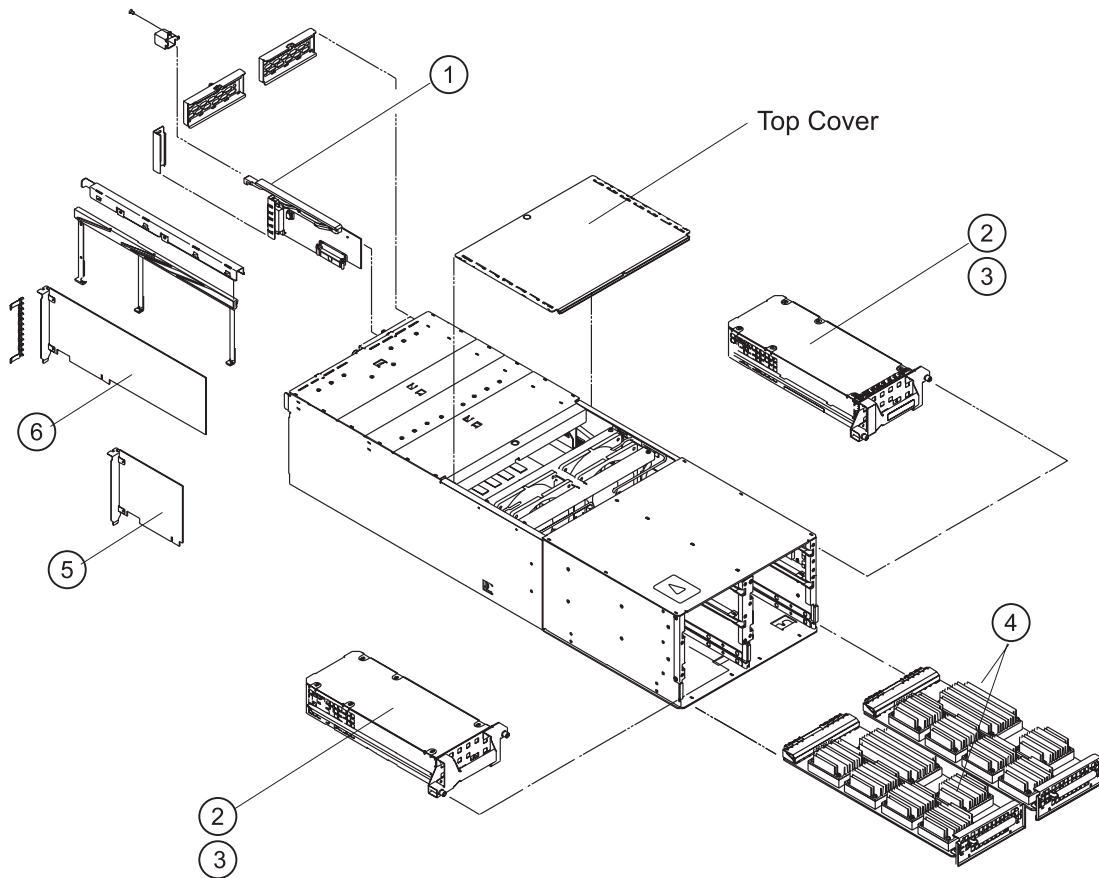
Asm–Index	Part Number	Units	Description
6–1	31L8752	1	Card, Supervisor
–2		AR	DASD (reference only) (See "DASD part numbers" on page 5-14.)
–3	21L3856	AR	SSA Jumper, DASD Enclosure (SSA DASD only)
–4	12K0446	2	Power Supply
–5	08J6015	AR	Blank, PCI Card
–6		AR	Card, PCI (reference only)

DASD part numbers

Feature Code	Part Number	Size (GB)	Type	Address Jumper
2918 See note 1	5986923	18.2	Ultra	45G9800
2909 See note 1	59H6926	9.1	Ultra	45G9800
3800 See note 2	31L8768	9.1	Ultra	
3802 See note 2	31L8540	9.1	SSA	
3803 See note 2	31L8770	18.2	Ultra	
9612	21L3856	DASD Jumper	Loop connector for SP Expansion I/O Units with SSA DASD	

Table 5-1. DASD part numbers

Notes:

1. Mirrored DASD for POWER3 SMP High Nodes.

2. Mirrored DASD for SP Expansion I/O Units.

RS/6000 SP memory part numbers

Description	F/C	DIMMless Card FRU #	DIMM FRU #	DIMM Size
128 MB	4211	07L6608	93H4702	128 MB
Base Card	4880	07L6608	93H4702	128 MB

Table 5-2. POWER3 SMP High Node memory cards and DIMM options

Appendix A. Messages and codes

Error code to FRU index

The error code to FRU index lists error symptoms and possible causes. The most likely cause is listed first. Use this index to help decide which FRUs to replace when servicing the system.

Obtaining and analyzing error codes

If the codes in the following tables indicate a device which is present more than once in the processor node, a location code is needed to specify which device generated the error.

Location code descriptions can be found under "Location codes" on page A-45.

Error codes can be obtained from the System On-line Diagnostics (diag), Service Processor Previous Boot history, and System Management Services error log:

- **Node On-line Diagnostics, Problem Determination**

  1. At a node prompt (either from TTY or TN connection), enter **diag**
  2. Press **Enter** to continue, then:
     - Choose Advanced Diagnostic Routines.
     - Choose Problem Determination.
     - Press **Enter** for All Resources.
     - Press **F7** to Commit and execute.
     - When test completes, examine results for error codes reported.
     - Find error in this appendix or SRN in *Diagnostic Information for Multiple Bus Systems* and perform listed action.

- **Service Processor Menu**. Check previous boot log for any errors.

  1. Logically power off the SMP node
  2. From the Service Processor Menu:
     - Choose System Information Menu.
     - Choose Read Progress Indicators from Last System Boot.
     - Choose Read System POST Errors (optional).
     - Examine data provided for unexpected error codes or abnormal termination of boot progress.
     - Find error in this appendix and perform listed action.

- **System Management Services error log**

  1. Switch the node off, then on.
  2. When the word "keyboard" is displayed, press **1** on the TTY console.
  3. When the System Management Services appear, check the error log for any errors:
     - Choose Utilities.
     - Choose Error Log.
     - If an error is logged, check the time stamp.
     - If the error was logged during the current boot attempt, record it.
     - Find error in this appendix and perform listed action.
     - If no recent error is logged in the error log, go to the "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.

Attention: Some 48 V dc power cables to the processor nodes have inline circuit breakers. Ensure that the inline circuit breaker switch is off (0) before connecting or disconnecting 48 V dc power cables from the node.

Error code notes:

1. If more than eight digits are given for an error, use only the first eight digits to find the error in the tables. The digits that display beyond the first eight digits are location codes that can assist you in diagnosing the problem. See "Location codes" on page A-45.

2. The service processor component of the POWER3 SMP High Node is contained in the I/O planar.

3. If the MAPs indicate the I/O planar should be replaced, perform the following steps:

   a. Licensed programs frequently rely on network configuration and system information stored on the VPD on the I/O planar (see Figure 2-9 on page 2-11). If the MAPs indicate that the node I/O planar should be replaced, swap the VPD from the old node I/O planar to the new one. If the old VPD module has to be replaced, call technical support for recovery instructions. If recovery is not possible, notify the system owner that new keys from licensed programs may be required.
   b. Perform actions in note 4, below.
   c. Perform actions in note 5, below.

4. If a network adapter or I/O planar is replaced, notify the system administrator that the new hardware address can be acquired from the node using `smit hrdwrad_dialog` or `sphrdwrad` command. In addition, the operating system configuration of the network controller may need to be changed in order to enable system startup. Also, check to ensure that any client or server that addresses this system is updated.

5. If the I/O planar is replaced, you must check (and update if necessary) the system and service processor firmware prior to completing service. Refer to "Service processor flash EPROM updates (and system firmware)" on page 3-48.

6. Replace FRU indicated by the error code first.

   • If the problem persists, replace the FRUs one at a time in the order given in the "Action / Possible Failing FRU" columns of the error code tables.

   Note: Go to "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29 for any of the following conditions:

      • An eight-digit code displays in the error code table but it does not contain a repair action or FRU listing.

      • All of the FRUs listed in the repair action have been replaced and the problem has not been corrected.

7. Following successful repair of the processor node, go to the "End of Call" MAP in the *RS/6000 SP: System Service Guide*.

8. If an SP Expansion I/O Unit is failing, determine the failing unit by identifying which unit displays an LED code indicating a failure.

Firmware and service processor codes

If you replace FRUs and the problem is still not corrected, go to "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.

Table   A-2 (Page 1 of 13). POWER3 SMP High Node firmware error codes

Error Code	Description	Action / Possible Failing FRU	FRU Location Code
20110xxy	SP Expansion I/O Unit power card failure	1. Replace power supply *y* in unit *xx*. Where the power card (or cards) *y* is : 3=Both power cards 2=Power card 2 (V2) 1=Power card 1 (V1) 2. Check ac power source to SP Expansion I/O Unit *xx*. Where *xx*: 1=SP expansion I/O unit 0, 2=unit 1, 3=unit 2, and 4=unit 3 See "Obtaining and analyzing error codes" on page A-1.	V2 V1

Error Code	Description	Action / Possible Failing FRU	FRU Location Code
Table A-2 (Page 2 of 13). POWER3 SMP High Node firmware error codes			
203w0xyz	SP Expansion I/O Unit configuration warning. Indicates an SP Expansion I/O Unit configuration was detected that does not result in complete loops. See Figure 2-17 on page 2-17 for a view of the rear of the SP Expansion I/O Unit and Figure 2-15 on page 2-16 for a diagram showing complete loops. The system continues to boot, however performance or recovery capability may be reduced. The problem may result in missing I/O. SP Expansion I/O Units should be connected in loops. Check SP Expansion I/O Unit cables for loose connections and unit power by verifying fan motion. Use the letters w, y, and z in the error code to isolate the open loop: • w=SP Expansion I/O Unit loop number • x=Always 0 • y=SP Expansion I/O Unit port number • z=0 indicates an incorrectly cabled SP Expansion I/O Unit configuration • z=B indicates a missing return link from the SP Expansion I/O Unit to the node • z=C indicates a missing cable between two SP Expansion I/O Units • z=D indicates a BIST failure in the SP Expansion I/O Unit • z=E indicates an SP Expansion I/O Unit is connected to port 1, 3, or 5 with no return to the node and no SP Expansion I/O Unit was found connected to port 2, 4, or 6 (respectively). This causes the I/O connected to ports 1, 3, or 5 to be removed from the configuration since the cause of the error and the proper location of the I/O cannot be determined.	Go to the "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.	
20A80000	Insufficient information to boot	Verify the IP address	
20A80001	Client IP address is already in use by other network device	Change IP address.	

Table A-2 (Page 3 of 13). POWER3 SMP High Node firmware error codes			
Error Code	**Description**	**Action / Possible Failing FRU**	**FRU Location Code**
20A80002	Cannot get gateway IP address	Refer to Table A-7 on page A-37 using code **E174**	
20A80003	Cannot get server hardware address	Refer to Table A-7 on page A-37 using code **E174**	
20A80004	Bootp failed	Refer to Table A-7 on page A-37 using code **E175**	
20A80005	File transmission (FTP) failed	Check network connection, try again	
20A80006	Boot image too large	Contact your next level of support	
20D00xxx	Unknown/unrecognized device		
20D0000F	Self-test failed on device, no error and/or location code information available	Refer "Obtaining and analyzing error codes" on page A-1, to see if a location code is available for the device the error was reported against. • Replace device indicated by the location code (if available). • Go to the "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.	
20D00010	Self-test failed on device, can't locate package	Contact your next level of support	
20D00011	RTAS attempt to allocate memory failed	Contact your next level of support	
20E00xxx	Security		
20E00001	Privileged-access password entry error	The password has been entered incorrectly. Retry installing the password.	
20E00009	Invalid password entered — system locked	The password has been entered incorrectly 3 times. Power the system unit off, then on. Then enter the correct password.	
20EE0xxx	Informational		
20EE0003	IP parameter requires 3 dots "."	Enter valid IP parameter. Example: 000.000.000.000	
20EE0004	Invalid IP parameter	Enter valid IP parameter. Example: 000.000.000.000	
20EE0005	Invalid IP parameter (>255)	Enter valid IP parameter. Example: 255.192.002.000	
20EE0006	No recognized SCSI adapter present	This warning occurs when the selected SMS function cannot locate any SCSI adapter supported by the function. Replace the node I/O planar	P2

Table A-2 (Page 4 of 13). POWER3 SMP High Node firmware error codes			
Error Code	**Description**	**Action / Possible Failing FRU**	**FRU Location Code**
20EE0008	No configurable adapters found in the system	This warning occurs when the selected SMS function cannot locate any devices/adapters supported by the function. If a supported device is installed: 1. Replace the device or adapter. (See "Error code notes" on page A-2.) 2. Replace the I/O planar in the SP Expansion I/O Unit containing the device (adapter).	P1
20EE0009	Unable to communicate with the service processor	Replace the node I/O planar	P2
20EE000B	The system was not able to find an operating system on the device list that was attempted.	Modify the boot sequence (also known as boot list) to include devices that are known to contain a copy of the operating system. This can be accomplished by using the System Management Services menus. For example, select a hard disk known to have a copy of the operating system as the first and only device in the boot sequence (boot list) and reboot.	

Table A-2 (Page 5 of 13). POWER3 SMP High Node firmware error codes			
Error Code	**Description**	**Action / Possible Failing FRU**	**FRU Location Code**
20EE000C	Pointer to the operating system found in non-volatile storage.	Values normally found in non-volatile storage that point to the location of an operating system were not found. This can happen for two reasons, either your installed operating system doesn't support storing the values or some event occurred that caused the system to lose non-volatile storage information (drainage or replace-ment of the battery). If you are running AIX, this information can be reconstructed by running the bootlist command specifying the device on which the operating system is installed. Refer to your AIX documentation for the exact syntax and usage of the bootlist command. To boot the operating system and reconstruct the values mentioned above, power the system off, then on. The system looks for the oper-ating system in the devices con-tained in the custom boot list or in the default boot list, depending on the condition of the system. If this is not successful, modify the boot sequence (also known as boot list) to include devices that are known to contain a copy of the operating system. Do this using the System Management Services menus. For example, select a hard disk known to have a copy of the operating system as the first, and only, device in the boot sequence (boot list) and reboot.	

Error Code	Description	Action / Possible Failing FRU	FRU Location Code

21A000xxx	SCSI Device Errors	**Notes:**
		
		1. Before replacing any system components:
		
		   a. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID
		   b. Ensure SCSI bus is properly terminated
		   c. Ensure SCSI signal and power cables are securely connected and not damaged
		
		2. The location code information is required to identify the ID of SCSI device failures as well as to indicate the location of the controller to which the device is attached. Check the system error logs to determine the location code information associated with the error code.	

21A00001	Test unit ready failed - hardware error	Refer to the notes in error code 21A000xxx 1. Replace SCSI device 2. Replace SCSI cable 3. Replace SCSI controller	
21A00002	Test unit ready failed - sense data available	Refer to the notes in error code 21A000xxx Replace SCSI device	
21A00003	Send diagnostic failed	Refer to the notes in error code 21A000xxx Replace SCSI device	
21A00004	Send diagnostic failed - DevOfl cmd	Refer to the notes in error code 21A000xxx Replace SCSI device	
21E00xxx	SCSI tape	Refer to 21A00xxx for a description and repair action for the xxx value	
21ED0xxx	SCSI changer	Refer to 21A00xxx for a description and repair action for the xxx value	
21EE0xxx	Other SCSI device type	Refer to 21A00xxx for a description and repair action for the xxx value	
21F00xxx	SCSI CDROM	Refer to 21A00xxx for a description and repair action for the xxx value	
21F20xxx	SCSI Read/Write Optical	Refer to 21A00xxx for a description and repair action for the xxx value	

Table A-2 (Page 6 of 13). POWER3 SMP High Node firmware error codes

Table A-2 (Page 7 of 13). POWER3 SMP High Node firmware error codes			
Error Code	**Description**	**Action / Possible Failing FRU**	**FRU Location Code**
22000001	PCI Ethernet BNC/RJ-45 or PCI Ethernet AUI/RJ-45 adapter—internal wrap test failure	Replace adapter (see "Obtaining and analyzing error codes" on page A-1)	
22001001	10/100 Mbps Ethernet PCI Adapter—internal wrap test failure	Replace adapter (see "Obtaining and analyzing error codes" on page A-1)	
22010001	PCI Auto LANstreamer Token Ring adapter—adapter failed to complete hardware initialization.	Replace adapter (see "Obtaining and analyzing error codes" on page A-1)	
22011001	PCI Token Ring adapter—adapter failed to complete hardware initialization.	Replace adapter (see "Obtaining and analyzing error codes" on page A-1)	
25A00001	Cache L2 controller failure	1. Replace CPU card (see "Obtaining and analyzing error codes" on page A-1) 2. Replace system planar	P1-Cx P1
25A10001	Cache L2 SRAM failure	Replace CPU card (see "Obtaining and analyzing error codes" on page A-1)	
25A80xxx	NVRAM problem	Errors reported against NVRAM can be caused by low battery voltage and (rarely) power outages that occur during normal system usage. With the exception of the 25A80000 error, these errors are warnings that the NVRAM data content had to be reestablished and do not require any FRU replacement unless the error is persistent. When one of these errors occurs, any system customization (for example, boot device list) information has been lost, the system may need to be reconfigured. If the error is persistent, replace node I/O planar (P2)	P2
25A80000	Initialization failed, device test failed	Refer to action under error code 25A80xxx	
25A80001	Init-NVRAM invoked, All of NVRAM initialized	Refer to action under error code 25A80xxx	
25A80002	Init-NVRAM invoked, some data partitions may have been preserved	Refer to action under error code 25A80xxx	
25A80011	Data corruption detected, All of NVRAM initialized	Refer to action under error code 25A80xxx	
25A80012	Data corruption detected, some data partitions may have been preserved	Refer to action under error code 25A80xxx	

Table A-2 (Page 8 of 13). POWER3 SMP High Node firmware error codes			
Error Code	**Description**	**Action / Possible Failing FRU**	**FRU Location Code**
25A80100	NVRAM data validation check failed	Power system unit off, then on, and retry the operation before replacing any system component. Refer to action under error code 25A80xxx.	
25A80201	Unable to expand target partition—saving configuration vari-able	Refer to Action under error code 25A80xxx	
25A80202	Unable to expand target partition—writing error log entry	Refer to action under error code 25A80xxx	
25A80203	Unable to expand target partition—writing VPD data	Refer to action under error code 25A80xxx	
25A80210	Setenv/$Setenv parameter error—name contains a null char-acter	Refer to action under error code 25A80xxx	
25A80211	Setenv/$Setenv parameter error—value contains a null char-acter	Refer to action under error code 25A80xxx	

Table A-2 (Page 9 of 13). POWER3 SMP High Node firmware error codes			
Error Code	**Description**	**Action / Possible Failing FRU**	**FRU Location Code**

25A80998	NVRAMRC script evaluation error—command line execution error	Execution of a command line within the NVRAM configuration variable *nvramrc* (script) resulted in a "throw" being executed. This script can be modified by the system firmware SMS utilities, the operating system, PCI adapter ROM code or utility, or an operator (via the open firmware script editing command *nvedit*). It may not be possible to resolve the problem without a detailed analysis of the NVRAM script, the current system configuration, and device tree contents.
		
		• The problem can be caused by a SCSI adapter, whose SCSI bus ID has been changed from the default setting, no longer appearing in the system. This can be caused either by removing a SCSI adapter, or a problem with a SCSI adapter
		  1. Select the SCSI ID utility from the SMS menus
		  2.
		     a. Verify the list of SCSI controllers (adapters). If the list is not correct, suspect a problem with the adapters installed but not listed
		     b. Select the option to "Save" the configuration information
		     c. Restart the system.
		  3. If the problem persists, boot the operating system and verify the SCSI bus IDs of any installed or available SCSI controllers (change as necessary), and restart the system
		• Contact your next level of support	

25A80999	NVRAMRC script evaluation error—stack unbalanced on completion	This is a firmware debug environment error. There is no user action or FRU replacement for this error	

		Table A-2 (Page 10 of 13). POWER3 SMP High Node firmware error codes	
Error Code	**Description**	**Action / Possible Failing FRU**	**FRU Location Code**
26020001	Invalid PCI adapter vendor ID	1. Move card to another slot (behind a different PCI bridge) 2. Check for available adapter firmware updates (apply if available) 3. Run AIX diagnostics on adapter. Replace adapter if indicated 4. Check for system firmware updates (apply if available) 5. Replace adapter 6. Replace any attached devices (DASD or other) 7. Replace I/O planar	Px-Ix Px
26020002	Invalid PCI adapter device ID	1. Move card to another slot (behind a different PCI bridge) 2. Check for available adapter firmware updates (apply if available) 3. Run AIX diagnostics on adapter. Replace adapter if indicated 4. Check for system firmware updates (apply if available) 5. Replace adapter 6. Replace any attached devices (DASD or other) 7. Replace I/O planar	Px-Ix Px
26020003	Invalid PCI adapter class code	1. Move card to another slot (behind a different PCI bridge) 2. Check for available adapter firmware updates (apply if available) 3. Run AIX diagnostics on adapter. Replace adapter if indicated 4. Check for system firmware updates (apply if available) 5. Replace adapter 6. Replace any attached devices (DASD or other) 7. Replace I/O planar	Px-Ix Px

Table A-2 (Page 11 of 13). POWER3 SMP High Node firmware error codes			
Error Code	**Description**	**Action / Possible Failing FRU**	**FRU Location Code**
26020007	Failed to allocate bus resources to adapter	1. Move card to another slot (behind a different PCI bridge) 2. Check for available adapter firmware updates (apply if available) 3. Run AIX diagnostics on adapter. Replace adapter if indicated 4. Check for system firmware updates (apply if available) 5. Replace adapter 6. Replace any attached devices (DASD or other) 7. Replace I/O planar	Px-Ix Px
26800Cxx	Machine check occurred	The problem is associated with an adapter in an SP Expansion I/O Unit. 1. Replace adapter 2. Replace SP Expansion I/O Unit planar See "Obtaining and analyzing error codes" on page A-1 for location code information related to this error.	
26800Dxx	Machine check occurred, unable to isolate to a single device	*xx* indicates the PCI bus number with the error. Refer to "Bus SRN to FRU reference table" on page A-29 using PCI bus *xx* to isolate the failing device.	
278000y0	HPSMESS	"y" indicates the primary SP Expansion I/O Unit port number on the system node. Failure is in the drawer attached to the port number defined by "y". 1. Before replacing any parts, remove cards in slots 7 and slot 8 of the failing drawer. If error does not repeat, identify the failing part by trying each card separately. 2. If error does reoccur, replace the SP Expansion I/O Unit planar.	
28030xxx	RTC errors		

Table A-2 (Page 12 of 13). POWER3 SMP High Node firmware error codes			
Error Code	**Description**	**Action / Possible Failing FRU**	**FRU Location Code**
28030001	RTC not updating—RTC initialization required	Errors reported against the Real Time Clock can be caused by low battery voltage and (rarely) power outages that occur during normal system usage. These errors are warnings that the Real Time Clock data content needs to be reestablished and do not require any FRU replacement unless the error is persistent. When one of these errors occurs, the time and date information has been lost • To set/restore the time and date, use the operating system facility • If the error is persistent replace node I/O planar (P2)	P2
28030002	Bad time/date values	1. Set time and date 2. Refer to action under error code 28030001	
28030003	RTC not updating—not correctable	Replace node I/O planar	P2
28030004	RTC operating mode parameters (for example, data mode) changed	1. Set time and date 2. Refer to action under error code 28030001	
28030005	RTC battery error	1. Replace node I/O planar. **Note:** Password, time, and date must be set. 2. Refer to action under error code 28030001	P2
29000002	Keyboard/Mouse controller failed	Replace node I/O planar	P2
29A00003	Keyboard not present/detected	Replace node I/O planar	P2
29A00004	Keyboard stuck key detected	Replace node I/O planar	P2
29B00004	Mouse not present / detected	Replace node I/O planar	P2
2B200011	Processor is manually disabled	Use SP menus to enable the processor node and reboot	

2B200022	Processor deconfigured by the system	1. Use the location code provided to isolate the failing FRU.
		  a. If location code indicates P1-Cx (CPU card), replace the indicated CPU card.
		  b. If the location code indicates P1 (system planar), replace the system planar (P1).
		2. If the error persists, go to the "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.
			P1-Cx
			
			P1

Error Code	Description	Action / Possible Failing FRU	FRU Location Code
2B200031	Processor failure	Replace CPU card See "Obtaining and analyzing error codes" on page A-1 for location code information related to this error.	P1-Cx
2B200042	Unknown or unsupported processor card	Remove the unknown or unsupported processor card See "Obtaining and analyzing error codes" on page A-1 for location code information related to this error.	P1-Cx
2BA00000	Service processor POST failure	Replace node I/O planar	P2
2BA00012	Service processor reports self test failure	Replace node I/O planar	P2
2BA00013	Service processor reports bad NVRAM CRC	If problem persists, replace node I/O planar	P2
2BA00017	Service processor reports bad or low battery	1. Replace node I/O planar	P2
2BA00041	Service processor VPD is corrupted	Replace node I/O planar	P2

Table A-2 (Page 13 of 13). POWER3 SMP High Node firmware error codes

Error Code	Description	Action / Possible Failing FRU	FRU Location Code
40100005	A loss of system power detected	1. Possible loss of main power. Check 48-volt supply voltage. 2. Go to the "POWER3 SMP High Node power (MAP 0380)" on page 1-7.	
40110001	Power supply problem	1. Check 48-volt supply from frame 2. Check cable connectors at P1-J24 and P3-J7 3. Replace power planar 4. Replace node I/O planar	P3 P2
40110011	Power regulator problem on CPU card.	1. Replace CPU card 2. Replace power card 3. Replace power planar	P1-C1 to P1-C4 P3-V1 to P3-V9 P3
40110012	Redundant power regulator problem.	1. Replace CPU card 2. Replace power card 3. Replace power planar	P1-C1 to P1-C4 P3-V1 to P3-V9 P3

Table A-3 (Page 1 of 13). POWER3 SMP High Node service processor error codes

Table A-3 (Page 2 of 13). POWER3 SMP High Node service processor error codes			
Error Code	**Description**	**Action / Possible Failing FRU**	**FRU Location Code**

40111000	Power loss on either the CPU card or power card, or loss of 48v	1. Verify that the node circuit breakers are on.
		2. If a location code is provided and a CPU or power card is indicated, replace the indicated FRU.
		3. If no location code is provided:
		
		   a. Remove all CPU cards except one and reboot.
		
		     • If problem persists, exchange the CPU card.
		
		       – If problem persists after exchanging the CPU card, go to b.
		
		     • If problem goes away, one of the removed CPU cards is defective.
		
		       1) Reinstall the removed CPU cards one at a time to identify the defective card.
		
		       2) Replace the failed one.
		
		   b. Replace the power cards, one at a time
		
		   c. Replace the fan control card
		
		   d. Replace the node I/O planar
		
		   e. Replace the system planar
		
		   f. Replace the power backplane
		
		4. Go to "POWER3 SMP High Node power (MAP 0380)" on page 1-7.
			Ux.y-P3-Vx
			Ux.y-P3-X1
			Ux.y-P2
			Ux.y-P1
			Ux.y-P3

40111001	EPOW-5 problem (loss of necessary power regulators or loss of 48V)	1. Check cable connector at P1-J24 and P3-J7 2. Replace power card 3. Replace CPU card	P3-V1 to P3-V9 P1-C1 to P1-C4
40111002	High 2.3-volt reading detected	1. Replace CPU card 2. Replace power card 3. Replace system planar 4. Replace power planar	P1-C1 to P1-C4 P3-V4 P3 P1
40111012	High 2.6-volt reading detected	1. Replace CPU card 2. Replace power card 3. Check for possible loss of 48-volt distribution 4. Replace power planar	P1-C1 to P1-C4 P3-V7 or P3-V8 P3
40111022	High 5.0-volt reading detected.	1. Replace power cards 2. Replace I/O planar 3. Check power planar cable J4, replace if necessary 4. Replace power planar	P3-V4 P3 P2
40111032	High 3.3-volt reading detected	1. Replace power cards 2. Replace power planar	P3-V1 P3-V5 P3-V9 P3

Error Code	Description	Action / Possible Failing FRU	FRU Location Code
40111042	High 2.5-volt reading detected	1. Replace power cards 2. Replace I/O planar 3. Replace power planar	P3-V5, P3-V7, or P3-V8 P3 P2
40111052	High +12-volt reading detected	1. Replace power card 2. Replace I/O planar 3. Replace power planar	P3-V3 P3 P2
40111062	High 12-volt reading detected.	1. Replace power card 2. Replace I/O planar 3. Replace power planar	P3-V4 P3 P2
40111072	High +5 standby voltage reading detected	1. Replace power card 2. Replace I/O planar 3. Replace system planar 4. Replace CPU card 5. Replace power planar	P3-V3 P3 P2 P1 P1-C1 to P1-C4
40111082	Low 5.0-volt reading detected	1. Replace power card +5V 2. Replace system planar 3. Replace I/O planar 4. Check power planar cable J4, replace if necessary 5. Replace power planar	P3-V4 P3 P1 P2
40111092	Low 3.3-volt reading detected	1. Replace power cards +3.3V 2. Replace memory card 3. Replace system planar 4. Replace I/O planar 5. If P3-V1 or P3-V9, check power planar cable J7 and replace if necessary 6. If P3-V5, check power planar cable J4 and replace if necessary 7. Replace power planar	P3-V1, P3-V5, or P3-V9 P1-M1 to P1-M4 P1 P2
401110A2	Low +2.5-volt reading detected	1. Replace power cards +2.5V 2. Replace system planar 3. Replace I/O planar 4. Check power planar cable J7 and replace if necessary 5. Replace power planar	P3-V7 or P3-V8 P1 P3 P2
401110B2	Low +12-volt reading detected	1. Replace power card +12V 2. Replace I/O planar 3. Replace power planar	P3-V3 P2 P3
401110C2	Low -12-volt reading detected	1. Replace power card -12V 2. Replace I/O planar 3. Replace power planar	P3-V4 P2 P3
401110D2	Low +5-volt standby reading detected	1. Replace power card +5V standby 2. Replace I/O planar 3. Replace system planar	P3-V3 P2 P1

Table A-3 (Page 4 of 13). POWER3 SMP High Node service processor error codes			
Error Code	**Description**	**Action / Possible Failing FRU**	**FRU Location Code**
401110E2	Low 2.3-volt reading detected	1. Replace power cards +3.3V 2. Replace memory card 3. Replace system planar 4. Replace I/O planar	P3-V1 or P3-V9 P1-M1 to P1-M4 P1 P2
401110F2	Low 2.6-volt reading detected	1. Replace power cards +2.5V 2. Replace system planar 3. Replace I/O planar 4. Replace power planar	P3-V7 or P3-V8 P1 P2 P3
40200042	Temperature warning detected Over temperature warning	1. Check for cool air flow, obstructions to the system, and the room ambient air temperature. 2. Use diagnostic service aids for Display System Environmental Sensors to identify the failing components. 3. Location code points to sensor that detected the warning. 4. Replace I/O planar 5. Replace system planar	P2 P1
40200045	Critical temperature condition detected Over critical temperature	1. Check for cool air flow, obstructions to the system, and the room ambient air temperature. 2. Use diagnostic service aids for Display System Environmental Sensors or the service processor menus (view System Environmental Conditions) to identify the failing components. 3. Location code points to sensor that detected the warning. 4. Replace I/O planar 5. Replace system planar	P2 P1
40210011	Slow fan detected	1. Use diagnostic service aids for Display System Environmental Sensors or the service processor menus (view System Environmental Conditions) to identify the failing components. 2. Check cooling assembly connection at P3-J8 and J9, and DASD power connector D1. 3. Replace fan 4. Replace fan control card 5. Replace I/O planar	P1-F1 to P1-F6 P3-X1 Fan/DASD power cable P2
40210014	Stopped fan detected 1. A stopped fan detected 2. Fan connector unplugged 3. Fan sensor defective	1. Use diagnostic service aids for Display System Environmental Sensors or the service processor menus (view System Environmental Conditions) to identify the failing components. 2. Check cooling assembly connection at P3-J8 and J9, and DASD power connector D1. 3. Replace failing fan 4. Replace fan control card 5. Replace I/O planar	P1-F1 to P1-F6 P3-X1 Fan/DASD power cable P2

Table A-3 (Page 5 of 13). POWER3 SMP High Node service processor error codes			
Error Code	**Description**	**Action / Possible Failing FRU**	**FRU Location Code**
40210015	Redundant stopped fan detected • A stuck fan • Fan connector unplugged • Fan sensor defective	1. Use diagnostic service aids for Display System Environmental Sensors or the service processor menus (view System Environmental Conditions) to identify the failing components. 2. Check cooling assembly connection at P3-J8 and J9, and DASD power connector D1. 3. Replace failing fan 4. Replace fan control card 5. Replace I/O planar	P1-F1 to P1-F6 P3-X1 Fan/DASD power cable P2
40210016	Combined fan and temperature problem (shutdown)	1. Use diagnostic service aids for Display System Environmental Sensors or the service processor menus (view System Environmental Conditions) to identify the failing components. 2. Check cooling assembly connection at P3-J8 and J9, and DASD power connector D1. 3. Replace failing fan 4. Replace fan control card 5. Replace I/O planar	P1-F1 to P1-F6 P3-X1 Fan/DASD power cable P2

Error Code	Description	Action / Possible Failing FRU	FRU Location Code

40A00000	System firmware IPL failure (FW Surveillance Time-out)	1. If a node I/O adapter (P2-Ix) or SP Expansion I/O Unit adapter (P1-Ix):
		
		  a. Replace the indicated FRU.
		
		  b. If the error persists, replace the other PCI adapter cards on the same PCI bus, one at a time.
		
		    • Refer to "Bus SRN to FRU reference table" on page A-29.
		
		  c. If problem persists after replacing PCI adapters, go to step 3.
		
		2. If processor location code (P1-Cx):
		
		  a. Replace the indicated FRU.
		
		  b. If the problem persists, remove the PCI adapters from P2-I1, P2-I2, P2-I3 and attempt to reboot.
		
		  c. If system boots, one of the removed adapters or the node I/O planar is defective.
		
		  d. Reinstall the adapters one at a time to determine the failing adapter.
		
		  e. If problem persists, go to step 3.
		
		3. Replace the I/O planar.
		
		  • If problem persists, go to step 4.
		
		4. Using service processor menus, select "Memory Configuration/Deconfiguration."
		
		  a. Identify the first bank of configured DIMMs based on the following memory card sequence (M2, M1, M3, M4).
		
		  b. Replace the first configured bank of memory DIMMs based upon the defined memory card sequence and reboot.
		
		    • If problem persists, continue with next step.
		
		  c. Replace the first configured memory card based upon the defined memory card sequence then reboot.
		
		    • If problem persists, go to "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.
			P1-Ix
			
			P2-Ix
			
			P1-Cx

40B00000	The operating system surveillance interval exceeded.	1. Check for errors or unusual conditions that might prevent the CPU from reporting heartbeat messages; such as system dump, machine check or checkstop error. Review the service processor error log. 2. If any logs show a hardware problem, open a hardware PMR and perform appropriate maintenance action. 3. If no hardware problem indicators found, collect information using SNAP tool, then open a software PMR to have collected data analyzed.	

Error Code	Description	Action / Possible Failing FRU	FRU Location Code
40D00201	Chip id test fail	1. Replace system planar 2. Replace I/O planar 3. Replace CPU card	P1 P2 P1-C1 to P1-C4
40D00202	Chip PLL test fail	1. Replace system planar 2. Replace I/O planar 3. Replace CPU card	P1 P2 P1-C1 to P1-C4
40D00203	Chip BIST test fail	1. Replace system planar 2. Replace I/O planar 3. Replace CPU card	P1 P2 P1-C1 to P1-C4
40D00300	Stalled Program Array Logic (PAL)	1. Replace system planar 2. Replace I/O planar 3. Replace CPU card	P1 P2 P1-C1 to P1-C4
40D00801	Memory recoverable failure	1. Run diagnostics in Problem Determination mode to determine the cause of the failure. 2. Replace memory DIMM 3. Replace memory card	P1-Mx.xx P1-Mx P1
45800001	System checkstop	See "System checkstop procedure (error code 45800001)" on page A-27.	

45800002	Checkstop SP Expansion I/O Unit bridge 0	1. Attempt to reboot the node in Service Mode, this preserves the AIX error log. If the reboot fails, attempt to reboot the node from a Network boot. If the reboot is successful, run the diagnostics in Problem Determination mode to determine the cause of the failure.
		
		2. If no location code exists, go to the "Bridge isolation procedure (MAP 0430)" on page 1-54 to isolate the defective component causing the checkstop.
		
		3. If the location code indicates the node I/O planar (P2), replace the planar.
		
		4. If the location code is an SP Expansion I/O Unit referenced from the node I/O planar connector (P2/Qx or P2-Qx):
		
		  a. The specific frame and node location could not be identified automatically.
		
		    • Use PSSP cabling diagram tool to identify the drawer that contains the error
		
		  b. Use the location code provided and Figure 2-11 on page 2-13 to reference the SP Expansion I/O Unit cable connectors (Q1 or Q2). Physically follow the cable from the Qn connector specified to find the SP Expansion I/O Unit that caused the failure.
		
		  c. Go to the "Bridge isolation procedure (MAP 0430)" on page 1-54 to isolate the defective component causing the checkstop.
			P2

Table A-3 (Page 8 of 13). POWER3 SMP High Node service processor error codes			
Error Code	**Description**	**Action / Possible Failing FRU**	**FRU Location Code**

45800003	Checkstop SP Expansion I/O Unit bridge 1	1. Attempt to reboot the node in Service Mode, this preserves the AIX error log. If the reboot fails, attempt to reboot the node from a Network boot. If the reboot is successful, run the diagnostics in Problem Determination mode to determine the cause of the failure.
		
		2. If no location code exists, go to the "Bridge isolation procedure (MAP 0430)" on page 1-54 to isolate the defective component causing the checkstop.
		
		3. If the location code indicates the node I/O planar (P2), replace the planar.
		
		4. If the location code is an SP Expansion I/O Unit referenced from the node I/O planar connector (P2/Qx or P2-Qx):
		
		  a. The specific frame and node location could not be identified automatically.
		
		    • Use PSSP cabling diagram tool to identify the drawer that contains the error
		
		  b. Use the location code provided and Figure 2-11 on page 2-13 to reference the SP Expansion I/O Unit cable connectors (Q3 to Q4, or Q5 to Q6). Physically follow the cable from the Qn connector specified to find the SP Expansion I/O Unit that caused the failure.
		
		  c. Go to the "Bridge isolation procedure (MAP 0430)" on page 1-54 to isolate the defective component causing the checkstop.
			P2

45800004	EPOW7 power fault	1. Replace the FRU indicated by the location code. 2. System planar 3. If no location code go to "POWER3 SMP High Node power (MAP 0380)" on page 1-7.	P1

45800005	Probing PCI bus	1. Replace the adapter identified by the location code.
		
		  Note: If a network adapter is replaced, see "Error code notes" on page A-2.
		
		2. One at a time, replace the other PCI adapter cards on the same PCI bus.
		
		  Note: See "Bus SRN to FRU reference table" on page A-29.
		
		3. Replace Node I/O Planar.
		
		4. If no location code go to "Bridge isolation procedure (MAP 0430)" on page 1-54.
			P2

Table A-3 (Page 9 of 13). POWER3 SMP High Node service processor error codes			
Error Code	**Description**	**Action / Possible Failing FRU**	**FRU Location Code**

45B0080A	No memory found	1. Go to the service processor menus and check the "Configuration/Deconfiguration Menu" to determine if the memory was deconfigured by the system or user.
		  • If the memory was deconfigured by the user, reconfigure the memory and reboot the node.
		2. If the memory was deconfigured by the system, go to the service processor menu error log and look for a memory related error log entry. Use the location code provided in the error log and replace the identified component as indicated below:
		
		  a. If there is only one memory related error log entry:
		
		    1) Replace the FRU DIMMs in the order provided
		
		    2) Replace the memory card
		
		    3) Replace the system planar
		
		  b. If there are two entries which indicate the same memory card, but different DIMMs on that card:
		
		    1) Replace the DIMMs in the order indicated starting with the lowest numerical order memory error log entry.
		
		    2) Replace the memory card
		
		    3) Replace the System planar
		
		  c. If there are **more than** two entries which indicate the same memory card, but different DIMMs on the memory card:
		
		    1) Replace the memory card first.
		
		    2) Replace the DIMMs in the order provided starting with the lowest numerical order error log entry.
		
		    3) Replace the System planar.
			P1-Mx.xx
			
			P1-Mx
			
			P1

45C01800	Memory DIMM mismatch	1. Replace memory DIMM 2. Replace memory card 3. Replace system planar	P1-Mx.xx P1-Mx P1
45C01801	Memory DIMM size cannot be determined	1. Replace memory DIMM 2. Replace memory card 3. Replace system planar	P1-Mx.xx P1-Mx P1

Error Code	Description	Action / Possible Failing FRU	FRU Location Code

45C01802	Memory DIMM failure	1. If the memory was deconfigured by the system, go to the service processor menu error log and look for a memory related error log entry. Use the location code provided and replace the identified component as indicated below:
		
		  a. If there is only one memory related error log entry:
		
		    1) Replace the FRU DIMMs in the order provided
		
		    2) Replace the memory card
		
		    3) Replace the System planar
		
		  b. If there are two entries which indicate the same memory card, but different DIMMs on that card:
		
		    1) Replace the DIMMs in the order indicated starting with the lowest numerical order memory error log entry.
		
		    2) Replace the memory card
		
		    3) Replace the System planar
		
		  c. If there are **more than** two entries which indicate the same memory card, but different DIMMs on the memory card:
		
		    1) Replace the memory card first.
		
		    2) Replace the DIMMs in the order provided starting with the lowest numerical order error log entry.
		
		    3) Replace the System planar.
			P1-Mx.xx
			
			P1-Mx
			
			P1

Table A-3 (Page 10 of 13). POWER3 SMP High Node service processor error codes

Error Code	Description	Action / Possible Failing FRU	FRU Location Code

45C01803	Memory test failure. Failure type can not be determined	1. If the memory was deconfigured by the system, go to the service processor menu error log and look for a memory related error log entry. Use the location code provided and replace the identified component as indicated below:
		
		  a. If there is only one memory related error log entry:
		
		    1) Replace the FRU DIMMs in the order provided
		
		    2) Replace the memory card
		
		    3) Replace the System planar
		
		  b. If there are two entries which indicate the same memory card, but different DIMMs on that card:
		
		    1) Replace the DIMMs in the order indicated starting with the lowest numerical order memory error log entry.
		
		    2) Replace the memory card
		
		    3) Replace the System planar
		
		  c. If there are **more than** two entries which indicate the same memory card, but different DIMMs on the memory card:
		
		    1) Replace the memory card first.
		
		    2) Replace the DIMMs in the order provided starting with the lowest numerical order error log entry.
		
		    3) Replace the System planar.
			P1-Mx.xx
			
			P1-Mx
			
			P1

45C0180A	Clock initialization failure. Master system planar AB4	1. Replace system planar 2. Replace I/O planar	P1 P2
48800909	System VPD error	1. Replace I/O planar	P2
4880090A	VPD error	**Note:** Use the service processor error log menus to identify the failing components. If multiple power cards are identified, replace the FRUs identified in the order listed in the error log. 1. Use the location code provided to isolate the failing FRU. **Note:** If all power FRUs are called in the service processor menu error log, check the cable at P2-J23 and P3-J6 for proper seating. 2. Go to the "POWER3 SMP High Node power (MAP 0380)" on page 1-7.	
4B200043	Service processor reports JTAG error on I/O planar	Replace I/O planar	P2

Error Code	Description	Action / Possible Failing FRU	FRU Location Code

4B200044	JTAG bus error	1. Use the location code provided to isolate the failing FRU.
		   a. If location code indicates P1-Cx (CPU card), replace the indicated CPU card.
		   b. If the location code indicates P1 (system planar) or P2 (I/O planar), replace the FRUs in the following order:
		     1) Node I/O planar (P2)
		     2) System planar (P1)
		2. If the error persists, go to the "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.
			P1-Cx
			P2
			P1

4B200055	No processor found	1. Verify the CPU card is installed and seated properly.
		2. Use the service processor menus (Processor Configuration/Deconfiguration Menu) to verify processor status.
		
		  • If the processor was deconfigured by the user, reconfigure the processor and reboot the node.
		
		  • If the processor was deconfigured by the system, use the location code to replace the CPU card.
		
		3. If the problem persists, replace the system planar.
			P1-Cx
			P1

4B200057	The CPU cards are not compatible	Use the service processor menus (Processor Configuration/Deconfiguration menu) to verify the processors status to identify the failing components. 1. Remove cards 2. Verify part numbers 3. Install valid (compatible) cards	P1-C1 to P1-C4
4B2000A0	Missing DIMMs in a bank of 8 DIMMs	Install or reseat DIMMs, for each missing DIM, one at a time.	M1.1 to M1.32, M2.1 to M2.32, M3.1 to M3.32, M4.1 to M4.32
4BA00000	The system support controller (SSC) detects the service processor, but cannot establish communication. The system halts.	Replace I/O planar	P2
4BA00800	Unknown error	1. Check level of service processor firmware and update to latest level. 2. Go to the "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.	
4BA00828	Flash update (CRC) checksum fails	1. Check level of service processor firmware and update to latest level. 2. Replace I/O planar	P2

Error Code	Description	Action / Possible Failing FRU	FRU Location Code
4BA00829	Bad service processor firmware	1. Check level of service processor firmware and update to latest level. 2. Replace I/O planar	P2
4BA00830	IPLROS boot fail	See "E1xx code boot problems" on page 3-25	
4BA00831	Bad service processor image	1. Check level of service processor firmware and update to latest level. 2. Switch system power off, then on	
4BA00832	Error while doing flash update	1. Switch system power off, then on. Retry flash programming a few times. 2. Replace I/O planar 3. Replace power card 4. Replace power planar 5. Check 48V supply	P2 P3-V4 P3
4BA10003	SSC time-out	Replace I/O planar	P2
4BA10004	SSC 12C bus failure	Use the location code provided to isolate the failing FRU.	P2 P1-Cx P3-Vx P3-X1
4BA10005	I²C bus failure	1. Use location code, if provided, to isolate the failing FRU. 2. If no location code is provided, go to the "POWER3 SMP High Node power (MAP 0380)" on page 1-7.	
4BA80014	Recoverable temporary condition, unless followed by error code 4BA80015	Information only	
4BA80015	NVRAM reintialization failed	Replace I/O planar	P2

System checkstop procedure (error code 45800001): Use this procedure if you receive a 45800001 error code.

1. Reboot the system in Service Mode (see "SERVICE mode (from disk)" on page 3-2) this preserves the AIX error log. If the reboot is successful, run diagnostics in Problem Determination mode to determine the cause of the failure.
2. If no location code is provided, go to the "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29. Otherwise, use the location code provided as the primary FRU and perform the following actions based on the location code:

Table A-4. Error code 45800001 checkstop recovery	
Location code	**Action/possible failing FRU**

P1-C1 to P1-C4 (CPU cards)	Based one the number of CPU cards installed, take one of the following actions:
	
	• If there is only 1 CPU card installed, replace it.
	   – If this does not resolve the problem, replace the system planar (P1)
	
	• If more than one CPU card is installed, replace the indicated FRU and reboot the system.
	   – If the problem is not resolved, replace the remaining CPU cards one at a time.
	   – If you have replaced all CPU cards and the problem still exists, replace the system planar (P1)

P1 (system planar) or P2 (I/O planar)	1. Examine the Service Processor Error log from the last boot. If there are other error codes associated with the same boot, before the checkstop, then perform the actions associated with that error code. 2. If you do not find an applicable entry in the error log or if the problem persists, go to "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.

P1-M1.xx to P1-M4.xx (memory DIMM) or P1-M1 toP1-M4 (memory card	1. Review the SP error log using the service processor menu's.
	2. If there is only 1 memory related error log entry, use the FRU list provided and replace the FRUs in the order provided.
	3. If there are 2 entries which indicate the same memory card, but different DIMMS on that card, exchange the DIMMS in the order indicated starting with the most recent memory error log entry then:
	   a. Exchange the memory card.
	   b. Replace the system planar (P1).
	4. If there are **more than** 2 entries which indicate the same memory card, but different DIMMS on the memory card, exchange the memory card first then:
	   a. Exchange the DIMMS in the order provided starting with the most recent error log.
	   b. Replace the system planar (P1).

P2-I1 to P2-I5 (PCI adapter)	1. Replace the FRU specified by the location code. 2. Replace the other PCI adapter cards on the same PCI bus, one at a time (see "Bus SRN to FRU reference table" on page A-29). 3. Replace the node I/O planar (P2)

P2-Q1 to P2-Q6 (SP Expansion I/O Unit referenced from the node I/O planar connector)	1. The specific frame and node location could not be identified automatically.
	   • Physically trace the cables from node to SP Expansion I/O Unit.
	2. Based upon the location code or physical cabling, disconnect the SP Expansion I/O Unit loop cables from the node.
	3. IPL the node.
	   • If the node IPLs, the problem is in the disconnected SP Expansion I/O Unit loop, go to "Step 0400–012" on page 1-35.
	   • If the node does not IPL, use the new error information to continue problem determination.

P1-I1 to P1-I8 (PCI adapter in an SP Expansion I/O Unit)	1. Replace the FRU specified by the location code. 2. Replace the other PCI adapter cards on the same PCI bus, one at a time (see "Bus SRN to FRU reference table" on page A-29). 3. Replace the SP Expansion I/O Unit I/O planar (P1)

Bus SRN to FRU reference table

The following table is used to locate defective FRUs within the I/O planar PCI bus. If the system you are diagnosing produces a Service Request Number (SRN) which is contained in the following table, the bus and PCI slots for that bus are identified. Using the diagnostic test that produced the SRN, use the following procedure to identify the failing FRU.

Note: If you were sent here to isolate error code 26800D*xx*, use the following procedure to identify the failing FRU on PCI bus *xx*.

1. Switch off system power
2. Based on the SRN or PCI bus number you received, remove the adapters from the PCI bus slots identified in the following table
3. Switch on system power
4. Reboot the system or run the AIX diagnostics for the test that produced the original SRN
   - If a failure is detected on the SP Expansion I/O Unit with the adapters removed from the failing bus, the I/O planar is the isolated FRU. Replace the I/O planar
   - If a failure is not detected, reinstall the adapters, one at a time, into their original slot locations. Retest the configuration until a failure is detected. The last adapter installed is the failing adapter. Replace the adapter. If there is still a failure, replace the I/O planar
   - If a failure is not detected and all FRUs have been tested, call your next level of support

Table A-5 (Page 1 of 4). POWER3 SMP High Node Bus SRN to FRU reference table				
SRN	**Bus Identification**	**Bus Number**	**Possible Failing Device and AIX Location Code**	**Associated FRU**
Node I/O Planar				
9CC-100	PCI bus 00	00	Device installed in I/O slot 1 (10-80 to 10-87) or 1G-XX	Adapter or node I/O planar
			Device installed in I/O slot 2 (10-78 to 10-7F) or 1F-XX	Adapter or node I/O planar
			Device installed in I/O slot 3 (10-70 to 10-77) or 1E-XX	Adapter or node I/O planar
			PCI service processor ISA bridge	Node I/O planar
			Ethernet (10-68)	Node I/O planar
			SCSI (10-60)	Node I/O planar
9CC-101	PCI bus 01	08	Device installed in I/O slot 4 (20-60 to 20-67) or 2C-XX	Adapter or node I/O planar
			Device installed in I/O slot 5 (20-58 to 20-5F) or 2B-XX	Adapter or node I/O planar
SP Expansion I/O Unit I/O Planar (7 of 7)				
9CC-104	PCI bus 04	20	Device installed in I/O slot 3 (50-58 to 50-5F) or 5B-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 4 (50-60 to 50-67) or 5C-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-105	PCI bus 05	28	Device installed in I/O slot 1 (60-58 to 60-5F) or 6B-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 2 (60-60 to 60-67) or 6C-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-106	PCI bus 06	30	Device installed in I/O slot 7 (70-58 to 70-5F) or 7B-XX	Adapter or SP Expansion I/O Unit I/O planar

SRN	Bus Identification	Bus Number	Possible Failing Device and AIX Location Code	Associated FRU
			Device installed in I/O slot 8 (70-60 to 70-67) or 7C-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-107	PCI bus 07	38	Device installed in I/O slot 5 (80-58 to 80-5F) or 8B-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 6 (80-60 to 80-67) or 8C-XX	Adapter or SP Expansion I/O Unit I/O planar
SP Expansion I/O Unit I/O Planar (2 of 7)				
9CC-108	PCI bus 08	40	Device installed in I/O slot 3 (90-58 to 90-5F) or 9B-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 4 (90-60 to 90-67) or 9C-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-109	PCI bus 09	48	Device installed in I/O slot 1 (A0-58 to A0-5F) or AB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 2 (A0-60 to A0-67) or AC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-110	PCI bus 10	50	Device installed in I/O slot 7 (B0-58 to B0-5F) or BB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 8 (B0-60 to B0-67) or BC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-111	PCI bus 11	58	Device installed in I/O slot 5 (C0-58 to C0-5F) or CB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 6 (C0-60 to C0-67) or CC-XX	Adapter or SP Expansion I/O Unit I/O planar
SP Expansion I/O Unit I/O Planar (1 of 7)				
9CC-112	PCI bus 12	60	Device installed in I/O slot 3 (D0-58 to D0-5F) or DB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 4 (D0-60 to D0-67) or DC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-113	PCI bus 13	68	Device installed in I/O slot 1 (E0-58 to E0-5F) or EB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 2 (E0-60 to E0-67) or EC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-114	PCI bus 14	70	Device installed in I/O slot 7 (F0-58 to F0-5F) or FB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 8 (F0-60 to F0-67) or FC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-115	PCI bus 15	78	Device installed in I/O slot 5 (G0-58 to G0-5F) or GB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 6 (G0-60 to G0-67) or GC-XX	Adapter or SP Expansion I/O Unit I/O planar
SP Expansion I/O Unit I/O Planar (6 of 7)				
9CC-116	PCI bus 16	80	Device installed in I/O slot 3 (H0-58 to H0-5F) or HB-XX	Adapter or SP Expansion I/O Unit I/O planar

Table   A-5 (Page 2 of 4). POWER3 SMP High Node Bus SRN to FRU reference table

SRN	Bus Identification	Bus Number	Possible Failing Device and AIX Location Code	Associated FRU
			Table A-5 (Page 3 of 4). POWER3 SMP High Node Bus SRN to FRU reference table	
			Device installed in I/O slot 4 (H0-60 to H0-67) or HC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-117	PCI bus 17	88	Device installed in I/O slot 1 (J0-58 to J0-5F) or JB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 2 (J0-60 to J0-67) or JC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-118	PCI bus 18	90	Device installed in I/O slot 7 (K0-58 to K0-5F) or KB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 8 (K0-60 to K0-67) or KC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-119	PCI bus 19	98	Device installed in I/O slot 5 (L0-58 to L0-5F) or LB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 6 (L0-60 to L0-67) or LC-XX	Adapter or SP Expansion I/O Unit I/O planar
SP Expansion I/O Unit I/O Planar (5 of 7)				
9CC-120	PCI bus 20	A0	Device installed in I/O slot 3 (M0-58 to M0-5F) or MB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 4 (M0-60 to M0-67) or MC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-121	PCI bus 21	A8	Device installed in I/O slot 1 (N0-58 to N0-5F) or NB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 2 (N0-60 to N0-67) or NC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-122	PCI bus 22	B0	Device installed in I/O slot 7 (P0-58 to P0-5F) or PB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 8 (P0-60 to P0-67) or PC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-123	PCI bus 23	B8	Device installed in I/O slot 5 (Q0-58 to Q0-5F) or QB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 6 (Q0-60 to Q0-67) or QC-XX	Adapter or SP Expansion I/O Unit I/O planar
SP Expansion I/O Unit I/O Planar (4 of 7)				
9CC-124	PCI bus 24	C0	Device installed in I/O slot 3 (S0-58 to S0-5F) or SB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 4 (S0-60 to S0-67) or SC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-125	PCI bus 25	C8	Device installed in I/O slot 1 (R0-58 to R0-5F) or RB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 2 (R0-60 to R0-67) or RC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-126	PCI bus 26	D0	Device installed in I/O slot 7 (T0-58 to T0-5F) or TB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 8 (T0-60 to T0-67) or TC-XX	Adapter or SP Expansion I/O Unit I/O planar

SRN	Bus Identification	Bus Number	Possible Failing Device and AIX Location Code	Associated FRU
Table A-5 (Page 4 of 4). POWER3 SMP High Node Bus SRN to FRU reference table				
9CC-127	PCI bus 27	D8	Device installed in I/O slot 5 (U0-58 to U0-5F) or UB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 6 (U0-60 to U0-67) or UC-XX	Adapter or SP Expansion I/O Unit I/O planar
SP Expansion I/O Unit I/O Planar (3 of 7)				
9CC-128	PCI bus 28	E0	Device installed in I/O slot 3 (V0-58 to V0-5F) or VB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 4 (V0-60 to V0-67) or VC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-129	PCI bus 29	E8	Device installed in I/O slot 1 (W0-58 to W0-5F) or WB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 2 (W0-60 to W0-67) or WC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-130	PCI bus 30	F0	Device installed in I/O slot 7 (X0-58 to X0-5F) or XB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 8 (X0-60 to X0-67) or XC-XX	Adapter or SP Expansion I/O Unit I/O planar
9CC-131	PCI bus 31	F8	Device installed in I/O slot 5 (Y0-58 to Y0-5F) or YB-XX	Adapter or SP Expansion I/O Unit I/O planar
			Device installed in I/O slot 6 (Y0-60 to Y0-67) or YC-XX	Adapter or SP Expansion I/O Unit I/O planar

Checkpoints

Checkpoints are intended to let users and service personal know what the system is doing, with some detail, as it initializes. These checkpoints are not intended to be error indicators, but in some cases the system could hang at one of the checkpoints without displaying an 8-character error code. It is for these hang conditions, only, that any action should be taken with respect to checkpoints. The most appropriate action is included with each checkpoint.

Before taking actions listed with a checkpoint, it is a good idea to look for better symptoms in the service processor error log.

Service processor checkpoints

Service processor checkpoints are in the range E010 to E0FF. The message **OK** indicates successful service processor testing and initialization. Firmware checkpoints are listed in "Firmware checkpoints" on page A-36.

Error code notes: Go to "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29 for any of the following conditions:

- A four-digit code in the range of E001 through EFFF is not listed in Table A-6 on page A-33 or Table A-7 on page A-37.

- A four-digit code displays in the checkpoint table, but does not contain a repair action or FRU listing.

- All of the FRUs listed in the repair action have been replaced and the problem has not been corrected.

Location codes are shown as *Ux.y* or *Uxxx.yy* where:

- *x*=Frame

- *y*=Node

Check-point	Description	Action/ Possible Failing FRU	FRU Location Code
Table A-6 (Page 1 of 4). POWER3 SMP High Node service processor checkpoints			
E000	SSC initialization	Information Only. If the system stops at the progress code, perform the following actions: 1. Replace I/O planar	P2
E010	Starting service processor self-tests	1. Replace I/O planar	P2
E011	Service processor self-tests completed successfully	Information Only. If the system stops at the progress code, perform the following actions: 1. Replace I/O planar	P2
E012	Begin to set up service processor's heap	1. Replace I/O planar	P2
E01F	Bad self-test; can not continue...	1. Replace I/O planar	P2
E020	Configuring CMOS	1. Replace I/O planar	P2
E021	Configuring NVRAM	1. Replace I/O planar	P2
E030	Beginning to build I2C resources–service processor LAN only	1. Replace I/O planar	P2
E031	Finished building I2C resources–service processor LAN only	1. Replace I/O planar	P2
E032	JTAG-service processor LAN only	Replace I/O planar	P2
E033	Init master clock AB4 I2C	1. Replace I/O planar 2. System planar	P2 P1
E039	Check AB4 PLL and check stalled PAL	1. Replace I/O planar 2. System planar	P2 P1
E040	Starting serial port tests	Replace I/O planar	P2
E041	Configuring a serial port (first time only)	Replace I/O planar	P2
E042	Configuring serial port 1	Replace I/O planar	P2

Check-point	Description	Action/ Possible Failing FRU	FRU Location Code
E043	Configuring serial port 2	Replace I/O planar	P2
E044	Preparing to set serial port	Replace I/O planar	P2
E045	Preparing to disconnect serial port	Replace I/O planar	P2
E050	Reading system VPD	Replace I/O planar	P2
E051	Reading CPU VPD	1. Replace CPU card 2. Replace system planar 3. Replace I/O planar	P1-C1 to P1-C4 P1 P2
E052	Reading memory card VPD	1. Replace memory card 2. Replace system planar 3. Replace I/O planar	P1-M1 to P1-M4 P1 P2
E053	Reading system planar VPD	1. Replace system planar 2. Replace I/O planar	P1 P2 1. P1 2. P2
E054	Reading Node I/O planar VPD	Replace I/O planar	P2
E055	Reading power card VPD	1. Replace power card 2. Replace I/O planar 3. Replace system planar	P3-V1 to P3-V10 P2 P1
E056	Reading Adapter Card VPD	Replace the indicated adapter card	P2-I1 to P2-I5
E060	Preparing to auto power-on (ac restored)	Replace I/O planar	P2
E061	Preparing to auto power-on (Timer)–Unattended start mode	Replace I/O planar	P2
E070	Configuring modem	Replace I/O planar	P2
E072	Preparing to call home	Replace I/O planar	P2

E075	Entering service processor menus	1. Check the TTY window on the control workstation.
		
		  a. If the service processor menu is not displayed, logically power off the node.
		
		  b. If the service processor menu is still not displayed, continue with step 2.
		
		2. Replace I/O planar.
		
		  • See "Error code notes" on page A-2
		
		3. Replace CPU card
			P2

Table A-6 (Page 2 of 4). POWER3 SMP High Node service processor checkpoints

Check-point	Description	Action/ Possible Failing FRU	FRU Location Code
E076	Leaving service processor menu	Replace I/O planar	P2
E0A0	Start bring-up phase	Replace I/O planar	P2
E0A1	Waiting for LBIST to complete	Replace I/O planar	P2
E0A2	Verify chip PLL lock	See "Error code notes" on page A-33.	
E0A3	Verify chip IDs	See "Error code notes" on page A-33.	
E0A4	Flush chips	See "Error code notes" on page A-33.	
E0A5	Enable chip drivers	See "Error code notes" on page A-33.	
E0A6	Lower chip fence	See "Error code notes" on page A-33.	
E0B0	Verify chip BIST on I/O planar	1. Replace I/O planar	P2
E0B1	Verify chip BIST on system planar	1. Replace system planar	P1
E0B2	Verify chip BIST on CPU card 1	1. Replace CPU card	P1-C1
E0B3	Verify chip BIST on CPU card 2	1. Replace CPU card	P1-C2
E0B4	Verify chip BIST on CPU card 3	1. Replace CPU card	P1-C3
E0B5	Verify chip BIST on CPU card 4	1. Replace CPU card	P1-C4
E0C0	Start system configuration	Information only–If system stops at this checkpoint, go to "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.	
E0C2	Configure chips on I/O planar	1. Replace I/O planar	P2
E0C3	Configure chips on system planar	1. Replace system planar	P1
E0C4	Configure chips on CPU card 1	1. Replace CPU card	P1-C1
E0C5	Configure chips on CPU card 2	1. Replace CPU card	P1-C2
E0C6	Configure chips on CPU card 3	1. Replace CPU card	P1-C3
E0C7	Configure chips on CPU card 4	1. Replace CPU card	P1-C4
E0CA	Starting memory reconfigura-tion	Replace system planar	P1
E0CE	Write CPU and memory info to NVRAM	Replace I/O planar	P2
E0D0	System memory test	1. Replace memory card	P1-M1 to P1-M4

Check-point	Description	Action/ Possible Failing FRU	FRU Location Code
Table A-6 (Page 4 of 4). POWER3 SMP High Node service processor checkpoints			
E0E0	Pulling CPUs out of reset (reset command sent to CPU)	See "Error code notes" on page A-33.	
E0F0	Create scan dump	See "Error code notes" on page A-33.	
OK	Information only. Service processor ready. Waiting for power-on	None. Normal operation. If you attempted to power-on and the operator panel hangs with OK, go to the "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.	
STBY	Service processor ready. System was shutdown by the operating system and is still powered on	This condition can be requested by a privileged system user with no faults. See the service processor error log for possible operating system fault indications	

Note: If the system hangs, go to"POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29 .

Firmware checkpoints

Firmware uses progress codes (checkpoints) in the range of E1xx to EFFF. These checkpoints occur during system startup and may be useful in diagnosing certain problems. Service processor checkpoints (E010 to E0FF) are listed in "Service processor checkpoints" on page A-32.

Error code notes: Go to "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29 for any of the following conditions:

- A four-digit code in the range of E100 through EFFF is not listed in the checkpoint table

- A four-digit code displays in the checkpoint table, but does not contain a repair action or FRU listing

- All of the FRUs listed in the repair action have been replaced and the problem has not been corrected.

Firmware hang problem: Firmware can hang due to multiple causes, such as by the primary processor of a memory problem in the first 64 MB of real memory. If a location code is not provided with the checkpoint, the following procedure uses the primary processor and low memory as the probable FRUs.

1. If firmware is hung (E100 through EFFF) and a location code is displayed on the second line of the operator panel, use it as the primary FRU.

2. If no location code is present or if replacing the primary FRU indicated in the location code did not fix the problem, perform the following:

   a. Shutdown the system power and go to the Service Processor menus.

   b. Select the Service Processor menu to Dump NVRAM.

   c. Select address 330.

d. Interrogate the first byte of data for the following Processor ID (valid numbers are 00–0F). If value is FF, go to 3 on page A-37.

Processor ID CPU card

00–03   P1-C2

04–07   P1-C1

08–11   P1-C3

12–15   P1-C4

e. Exchange the CPU card indicated.

f. Attempt to reboot the system. If the system hangs with a different checkpoint, follow the action items associated with that checkpoint.

3. If the system hangs at the same checkpoint, power off the system and use the Service menus to select the Memory Configuration/Deconfiguration option.

   Identify the first configured memory card and bank of DIMMs. Exchange the first configured bank of DIMMs.

4. Exchange the memory card.

5. Disconnect P2-I1, P2–I2, and P2-I3.

6. Attempt a reboot.

7. If the system still hangs, replace the node I/O planar.

8. Go to "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.

Table A-7 (Page 1 of 8). POWER3 SMP High Node firmware checkpoints		
Check-point	**Description**	**Action/ Possible Failing FRU**
E100	Reserved	See "Error code notes" on page A-36
E101	Create RTAS node	See "Firmware hang problem" on page A-36
E102	Load/Initialize RTAS	1. If a location code is associated with the checkpoint, replace the adapter identified by the location code. **Note:** If the network adapter is replaced, see "Error code notes" on page A-36. 2. One at a time, replace the other PCI adapter cards on the same PCI bus. **Note:** See "Bus SRN to FRU reference table" on page A-29 3. Replace I/O planar associated with the error code. • See "Error code notes" on page A-36.
E105	Transfer control to operating system (normal boot)	See "E1xx code boot problems" on page 3-25
E10A	Load RTAS device tree	See "Firmware hang problem" on page A-36
E10B	Set RTAS device properties	See "Firmware hang problem" on page A-36
E130	Build device tree	See "Firmware hang problem" on page A-36
E134	Create memory node	See "Firmware hang problem" on page A-36
E137	Create openprom node	See "Firmware hang problem" on page A-36

Check-point	Description	Action/ Possible Failing FRU
E138	Create options node	See "Firmware hang problem" on page A-36
E139	Create aliases node and system aliases	See "Firmware hang problem" on page A-36
E13A	Create packages node	See "Firmware hang problem" on page A-36
E140	Loading operating system	See "E1xx code boot problems" on page 3-25
E149	Create boot mgr node	See "Firmware hang problem" on page A-36
E14C	Create terminal-emulator node	See "Firmware hang problem" on page A-36
E14D	Load boot image	See "E1xx code boot problems" on page 3-25
E150	Create host (primary) PCI controller node	See "Error code notes" on page A-36
E151	Probing PCI bus	1. If a location code is associated with the checkpoint, replace the adapter identified by the location code **Note:** If a network adapter is replaced, see "Error code notes" on page A-2. 2. One at a time, replace the other PCI adapter cards on the same PCI bus. • See Table A-5 on page A-29 for bus SRN to FRU references. 3. Replace I/O planar associated with the error code. See "Error code notes" on page A-36.
E152	Probing for adapter FCODE, evaluate if present	Follow the repair action listed for checkpoint **E151**
E153	End adapter FCODE, probe/evaluation	See "Error code notes" on page A-36
E154	Create PCI bridge node	Follow the repair action listed for checkpoint **E151**
E155	Probing PCI bridge secondary bus	Follow the repair action listed for checkpoint **E151**
E156	Create PCI Ethernet node	Replace the I/O planar
E15B	Transferring control to operating system (service mode boot)	See "E1xx code boot problems" on page 3-25
E15F	Adapter VPD evaluation	Follow the repair action listed for checkpoint **E151**
E160	Collect system, node supervisor, node I/O planar VPD	See "Firmware hang problem" on page A-36
E161	Collect system planar, CPU cards VPD	See "Firmware hang problem" on page A-36
E162	Collect service processor VPD	See "Firmware hang problem" on page A-36
E163	Collect memory card and memory DIMM VPD	See "Firmware hang problem" on page A-36
E167	Collect power card VPD	See "Firmware hang problem" on page A-36
E170	Start of PCI bus probe	Follow the repair action listed for checkpoint **E151**
E172	First pass PCI device probe	Follow the repair action listed for checkpoint **E151**

Table A-7 (Page 2 of 8). POWER3 SMP High Node firmware checkpoints

Table A-7 (Page 3 of 8). POWER3 SMP High Node firmware checkpoints		
Check-point	**Description**	**Action/ Possible Failing FRU**
E174	Establish host connection	If the system is not connected to an active network or if the target server is inaccessible (this can also result from incorrect IP parameters being supplied), the system attempts to boot and because time-out durations are necessarily long to accommodate retries, the system may appear to be hung. Restart the system and go to the Firmware SMS utilities. In the utilities check: • Is the intended boot device correctly specified in the boot list? • Are the IP parameters correct? • Verify the network connection (network could be down) • Have network administrator verify the server configuration for this client • Attempt to "Ping" the target server using the SMS "Ping" utility
E175	BootP request	Follow the repair action listed for checkpoint **E174**
E176	TFTP file transfer	See "E1xx code boot problems" on page 3-25
E177	Transfer failure due to TFTP error condition	See "E1xx code boot problems" on page 3-25
E17B	CPU clock speed measurement	Replace I/O planar (P2)
E180	Service processor command setup	See "Error code notes" on page A-36
E183	Initializing support processor	Replace I/O planar (P2)
E190	Create ISA node	See "Firmware hang problem" on page A-36
E191	Create ISA reserved node	See "Firmware hang problem" on page A-36
E193	Initialize Super I/O	Replace the I/O planar
E196	Probe ISA bus	See "Firmware hang problem" on page A-36
E19B	Create service processor node	See "Firmware hang problem" on page A-36
E19C	Create tablet node	See "Firmware hang problem" on page A-36
E19D	Create NVRAM node	Replace the I/O planar
E19E	Real time clock (RTC) initialization	Refer to error code 28030xxx in "Firmware and service processor codes" on page A-3
E1AD	See description of checkpoint E1DE	See "Error code notes" on page A-36
E1B0	Create lpt node	See "Firmware hang problem" on page A-36
E1B1	Create serial node	See "Firmware hang problem" on page A-36
E1B2	Create audio node	See "Firmware hang problem" on page A-36
E1B3	Create 8042 node	Replace the I/O planar
E1B6	Probe for (ISA) keyboard	Replace the I/O planar
E1BD	Probe for (ISA) mouse	Replace the I/O planar
E1BE	Create op-panel node	See "Firmware hang problem" on page A-36

Table A-7 (Page 4 of 8). POWER3 SMP High Node firmware checkpoints		
Check-point	**Description**	**Action/ Possible Failing FRU**
E1BF	Create pwr-mgmt node	See "Firmware hang problem" on page A-36
E1C4	Create ISA timer chip node	See "Firmware hang problem" on page A-36
E1C5	Create ISA interrupt controller (pic) node	See "Firmware hang problem" on page A-36
E1C6	Create DMA node	See "Firmware hang problem" on page A-36
E1D0	Create PCI SCSI node	Follow the repair action listed for checkpoint **E156**
E1D3	Create SCSI block device node (SD)	Follow the repair action listed for checkpoint **E156**
E1D4	Create SCSI byte device node (ST)	Follow the repair action listed for checkpoint **E156**
E1DB	Create floppy controller (FDC) node	Replace the I/O planar
E1DC	Dynamic console selection	If selection screen(s) can be seen on the write-enabled console and the appropriate key is pressed, but there is no response to the keystroke within 60 seconds: 1. Reset the node supervisor by issuing following command from the control workstation: `hmcmds -G boot_supervisor FRAME#:SLOT#` (Node supervisor will flash slot address. Ignore messages about expected states on/off.) 2. Replace the node supervisor card 3. Replace the I/O planar
E1DE	Alternating pattern of E1DE and E1AD is used to indicate a default catch condition before the firmware "checkpoint" word is available.	See "Error code notes" on page A-36
E1F0	Start O.B.E.	See "Error code notes" on page A-36.
E1F1	Begin self-test sequence on boot device(s). Begin SMS	See "Error code notes" on page A-36
E1F2	Power-On Password prompt	Prompt should be visible on the system console. If a console is attached but nothing is displayed on it, go to the "Start Map" in the *RS/6000 SP: System Service Guide*.
E1F3	Privileged-Access Password prompt	Prompt should be visible on the system console. If a console is attached but nothing is displayed on it, go to the "Start Map" in the *RS/6000 SP: System Service Guide*.
E1F5	Build boot device list	This may be caused by Multiboot option enabled. 1. Disable using SMS Multiboot Menu, setting Multiboot Startup. 2. Prompt should be visible on the system console. • If a console is attached, but nothing is displayed on it, go to the "Start Map" in the *RS/6000 SP: System Service Guide*.

Table A-7 (Page 5 of 8). POWER3 SMP High Node firmware checkpoints		
Check-point	Description	Action/ Possible Failing FRU
E1F6	Determine boot device sequence	See "Error code notes" on page A-36

E1F7	No boot image located	1. Have the system administrator perform "Diagnosing Boot Problems" in the *PSSP Diagnosis Guide* (GA22–7350) to determine if the boot server is configured to serve the network boot image.
		
		2. Check the Ethernet LAN connections between the node and the boot server and control workstation. On a BNC/coax LAN, check for 50 ohm terminators at each end (**do not confuse with 25 ohm wrap plugs**). If a hub or switch is present, check that it is active.
		
		3. If the problem still exists, clear NVRAM in the node.
		
		4. Replace I/O planar. Refer to:
		  • "Error code notes" on page A-36
		  • "Error code notes" on page A-2

E1FB	Scan SCSI bus for attached devices	See "Error code notes" on page A-36.
E1FD	The operator panel alternates between the code E1FD and another Exxx code, where Exxx is the point at which the error occurred.	If the Exxx is not listed in this table, go to "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29.
E212	Processor POST	Replace the CPU card (see "Error code notes" on page A-2 and "Error code notes" on page A-36).
E216	Copy ROS into RAM. Setup Translation and C environment.	See "Firmware hang problem" on page A-36.
E298	Start firmware softload path execution	Replace softload image
E299	Start C code execution	See "Firmware hang problem" on page A-36
E440	Validate NVRAM, initialize partitions as needed	1. Verify that the system firmware levels are at the current release levels, update as necessary 2. Replace node I/O planar (location code: P2) if problem persists See "Error code notes" on page A-36
E441	Generate /options node NVRAM configuration variable properties.	1. Verify that the system firmware levels are at the current release levels, update as necessary 2. Replace node I/O planar (location code: P2) if problem persists See "Error code notes" on page A-36
E442	Validate NVRAM partitions.	1. Verify that the system firmware levels are at the current release levels, update as necessary 2. Replace node I/O planar (location code: P2) if problem persists See "Error code notes" on page A-36

Table A-7 (Page 6 of 8). POWER3 SMP High Node firmware checkpoints		
Check-point	Description	Action/ Possible Failing FRU
E443	Generate NVRAM configuration variable dictionary words	Suspect a system firmware problem if this problem persists. Verify that the system firmware is at the current release level, update as necessary. See "Error code notes" on page A-36
E500	Configure remote I/O subsystem (SP Expansion I/O Unit)	1. Configure SP Expansion I/O Unit 2. This code indicates the SP Expansion I/O Unit configuration has started or progressed to the point where the code can be displayed. See "Error code notes" on page A-36
E5xy	Configure remote I/O subsystem components	The E5xy (E511 to E5FF) codes are reserved for activities relating to configuration, or testing of, the POWER3 SMP High Node I/O or SP Expansion I/O Unit subsystems. A hang at one of these codes implies that a severe error occurred while programming I/O subsystem registers or when interacting with adapters plugged into the system. The last two digits can help isolate the location of the I/O activity causing the problem. *x* indicates the I/O bridge in the configuration. Where: **E51y** I/O bridge associated with the node's internal PCI slots (5 slots) **E53y** I/O bridge inside SP Expansion I/O Unit connected to node port 2 **E54y** I/O bridge inside SP Expansion I/O Unit connected to node port 1 *y* indicates a specific I/O bus related to bridge chip x. Where: **E510** I/O bridge associated with the node's internal PCI slots (5 slots) and the bridge chip itself (on node I/O planar) **E511** I/O bus 0 connected to bridge chip E510 **E512** I/O bus 1 connected to bridge chip E510 And where *y* equals (in all E5xy codes other than E510, E511,and E512): **E5x0** Bridge chip on SP Expansion I/O Unit **E5x1** I/O bus for PCI slots 3 and 4 of SP Expansion I/O Unit **E5x2** I/O bus for PCI slots 1 and 2 of SP Expansion I/O Unit **E5x3** I/O bus for PCI slots 7 and 8 of SP Expansion I/O Unit **E5x4** I/O bus for PCI slots 5 and 6 of SP Expansion I/O Unit See "Location codes" on page A-45. **Note:** If the node hangs at one of these codes, the next device to be configured is usually the failing component since the code is displayed after a component is configured. For example, if the system hangs at E531, suspect slots associated with E532 (possibly a misplugged or defective card). If boot hangs at Exx4, then the next SP Expansion I/O Unit probably had a critical error in the main bridge chip or initialization of the unit.

Table A-7 (Page 7 of 8). POWER3 SMP High Node firmware checkpoints		
Check-point	**Description**	**Action/ Possible Failing FRU**
E600	SSA PCI adapter open firmware has run successfully	Replace the adapter
E601	SSA PCI adapter BIST started but failed to complete after 4 seconds	Replace the adapter
E602	SSA PCI adapter open firmware has started	Replace the adapter
E603	SSA PCI adapter BIST has completed with an error	Replace the adapter
E604	SSA PCI adapter BIST and subsequent POSTs have completed successfully	Replace the adapter
E605	SSA PCI adapter BIST has completed successfully but the subsequent POSTs have failed	Replace the adapter
E60E	SSA PCI adapter open firmware about to exit (no stack corruption)	Replace the adapter
E60F	SSA PCI adapter open firmware has run unsuccessfully	Replace the adapter
E60FF	SSA PCI adapter open firmware about to exit (with stack corruption)	Replace the adapter

Table A-7 (Page 8 of 8). POWER3 SMP High Node firmware checkpoints		
Check-point	**Description**	**Action/ Possible Failing FRU**
E6xy	Configure remote I/O subsystem components	The E6xy (E611 to E6FF) codes are reserved for activities relating to configuration, or testing of, the POWER3 SMP High Node I/O or SP Expansion I/O Unit subsystems. A hang at one of these codes implies that a severe error occurred while programming I/O subsystem registers or when interacting with adapters plugged into the system. The last two digits can help isolate the location of the I/O activity causing the problem. *x* indicates the I/O bridge in the configuration. Where:
		E6*1*y I/O bridge inside SP Expansion I/O Unit connected to node port 6
		E6*2*y I/O bridge inside SP Expansion I/O Unit connected to node port 5
		E6*3*y I/O bridge inside SP Expansion I/O Unit connected to node port 4
		E6*4*y I/O bridge inside SP Expansion I/O Unit connected to node port 3
		y indicates a specific I/O bus related to bridge chip x. Where:
		E6x*0* Bridge chip on SP Expansion I/O Unit
		E6x*1* I/O bus for PCI slots 3 and 4 of SP Expansion I/O Unit
		E6x*2* I/O bus for PCI slots 1 and 2 of SP Expansion I/O Unit
		E6x*3* I/O bus for PCI slots 7 and 8 of SP Expansion I/O Unit
		E6x*4* I/O bus for PCI slots 5 and 6 of SP Expansion I/O Unit
		See "Location codes" on page A-45.
		Note: If the node hangs at one of these codes, the next device to be configured is usually the failing component since the code is displayed after a component is configured. For example, if the system hangs at E611, suspect slots associated with E612 (possibly a misplugged or defective card). If boot hangs at Exxx4, then the next SP Expansion I/O Unit probably had a critical error in the main bridge chip or initialization of the unit.

Directed service

The Error Code or Checkpoint that sent you here listed a possible FRU or FRU list. However, if another Error Code or Checkpoint displays while performing an isolation task, use the new indicator as the probable cause of the problem.

If possible, remove the FRUs listed then exchange them one at a time to isolate the failure.

Note: When isolating a failing FRU, you **must** maintain a minimum configuration of one memory card with one bank of eight DIMMs and one CPU card. These cards must be plugged and configured for the node to successfully IPL.

If this action does not isolate the problem, go to "POWER3 SMP High Node minimum configuration (MAP 0400)" on page 1-29 and perform minimum configuration problem determination on the processor node.

Location codes

This processor node uses Physical Location Codes in conjunction with AIX Location Codes to provide mapping of the failing field replaceable units. The location codes are produced by the processor node's firmware and AIX.

Physical location codes

Physical location codes provide a mapping of logical functions in a platform (or expansion sites for logical functions, such as connectors or ports) to their specific locations within the physical structure of the platform.

Location code format

Overview: Fully qualified location codes are shown prefixed with *Ux.y* or *Uxxx.yy* where:

- *x*=Frame
- *y*=Node

For example, U1.5 P1-C1 would represent:

- Frame 1
- Node location 5
- System planar P1
- Card C1

Detailed Description: The information contained in the location code is formatted into three segments: a base location, an extended location, and a sub-location. The segments are separated by a slash (/), pound sign (#), or period (.). Also, a dash (-) may be used as part of the location.

Base location

- Identifies the parent component and any device plugged directly into the parent.
- Includes all alphanumeric characters extending up to the slash (/) or pound sign (#).

Note: A dash (-) is used to separate the location code for a device plugged into the parent.

Extended location

- Identifies components attached to a device plugged into the parent.
- Includes all alphanumeric characters following the slash (/) or pound sign (#).
  - If a slash (/) is used, the component may be a device, a connector, or a cable.
  - If a pound sign (#) is used, the component is a cable.

Note: A dash (-) is used to separate the location code for a device plugged into the parent.

- If a dash (-) is followed by a Qx, it represents the SP Expansion I/O Unit attached to that cable.

Sub-location

- Identifies a specific component out of a family of components attached to a device.
- Includes all alphanumeric characters following a period (.).

Table A-8. Location code examples	
Location code:	**Identifies:**
P1	Planar P1
P1-C1	CPU card C1 plugged into planar P1
P1-C1.1	CPU 1 on CPU card C1 on planar P1
P1-M1	Memory card M1 plugged into planar P1
P1-M1.4	DIMM 4 on memory card M1 on planar P1
P1-K1	Keyboard attached to K1 on planar P1
P1/S1	Since a slash (/) is used, this can be either: • The controller for serial port 1 on planar P1 • The connector for serial port 1 • The cable attached to serial port 1
P1-I2	A PCI card plugged into slot 2 on planar P1
P1-I2/E3	Since a slash (/) is used, this can be either: • Ethernet controller 3 on the card in slot I2 • The connector for Ethernet controller 3 • The cable attached to Ethernet controller 3
P1-I2/E3.2	The second cable in a **series** of cables attached to Ethernet controller 3 on the card in slot I2 of planar P1
P2/Z1-A3.1	A SCSI device with SCSI address of LUN 1 at SCSI ID 3 attached to SCSI bus 1 from planar P2
P2/Q3	Cable or connector on port 3 of planar P2 (I/O planar)
P2-Q5	SP Expansion I/O Unit attached to cable or connector port 5 of planar P2 (I/O planar)
U1.12-P1-I0	I0 indicates an unknown I/O adapter. The full code indicates the unknown adapter is in the SP Expansion I/O Unit at frame 1, slot 12 but not enough information was available to fully isolate the problem.

Extended location information

Depending on the AIX and firmware levels, AIX Diagnostics may include the extended location information when identifying a planar or card. The extended location information or cable information is always included when identifying a cable or connector. Location **codes** with extended location information that are displayed **without a description** identifying the devices always identify the cable attached to the port.

Physical location code reference tables

Note: Refer to "Location diagrams of the RS/6000 SP components" on page 2-3 for figures showing physical locations.

POWER3 SMP High Node location codes

Table A-9 (Page 1 of 3). POWER3 SMP High Node physical location codes

FRU Name	AIX Location Code	Physical Location Code	Physical Connection
System planar	00-00	P1	
CPU card 1	Cache: 00-00	P1-C1	System planar J10
	Processor 1: 00-00	P1-C1	
	Processor 2: 00-01	P1-C1	
CPU card 2	Cache: 00-00	P1-C2	System planar J07
	Processor 1: 00-04	P1-C2	
	Processor 2: 00-05	P1-C2	
CPU card 3	Cache: 00-00	P1-C3	System planar J15
	Processor 1: 00-08	P1-C3	
	Processor 2: 00-09	P1-C3	
CPU card 4	Cache: 00-00	P1-C4	System planar J19
	Processor 1: 00-12	P1-C4	
	Processor 2: 00-13	P1-C4	
Memory card 1	00-00	P1-M1	(See Figure 2-10 on page 2-12)
DIMM 1–32	00-00	P1-M1.1 to P1-M1.32	Memory card 1
Memory card 2	00-00	P1-M2	(See Figure 2-10 on page 2-12)
DIMM 1–32	00-00	P1-M2.1–P1-M2.32	Memory card 2
Memory card 3	00-00	P1-M3	(See Figure 2-10 on page 2-12)
DIMM 1–32	00-00	P1-M3.1–P1-M3.32	Memory card 3
Memory card 4	00-00	P1-M4	(See Figure 2-10 on page 2-12)
DIMM 1–32	00-00	P1-M4.1–P1-M4.32	Memory card 4
Node I/O planar		P2	
System VPD		P2-N1	Modular - Node I/O planar
PCI controller 0	00-C800 0000		Node I/O planar
Integrated Ethernet	10-68	P2/E1	Node I/O planar
Integrated SCSI	10-60	P2/Z1	Node I/O planar
PCI adapter 1	(10-80 to 10-87) or 1G-XX	P2-I1	Node I/O planar 32–bit slot (JP5)
PCI adapter 2	(10-78 to 10-7F) or 1F-XX	P2-I2	Node I/O planar 64–bit slot (JP4)
PCI adapter 3	(10-70 to 10-77) or 1E-XX	P2-I3	Node I/O planar 64–bit slot (JP3)
PCI controller 1	00-C810 0000		Node I/O planar
PCI adapter 4	(20-60 to 20-67) or 2C-XX	P2-I4	Node I/O planar 64–bit slot (JP2)

Table A-9 (Page 2 of 3). POWER3 SMP High Node physical location codes

FRU Name	AIX Location Code	Physical Location Code	Physical Con-nection
PCI adapter 5	(20-58 to 20-5F) or 2B-XX	P2-I5	Node I/O planar 64–bit slot (JP1)
SP MX2 adapter		P2-W2	Node I/O planar (J4)
I/O planar bulkhead card		P2	Node I/O planar
SP Expansion I/O Unit 1 connector (SP expansion I/O interposer 1)		P2-Q1	Node I/O planar (JR7)
SP Expansion I/O Unit 2 connector (SP expansion I/O interposer 2)		P2-Q2	Node I/O planar (JR6)
SP Expansion I/O Unit 3 connector (SP expansion I/O interposer 3)		P2-Q3	Node I/O planar (JR4)
SP Expansion I/O Unit 4 connector (SP expansion I/O interposer 4)		P2-Q4	Node I/O planar (JR3)
SP Expansion I/O Unit 5 connector (SP expansion I/O interposer 5)		P2-Q5	Node I/O planar (JR2)
SP Expansion I/O Unit 6 connector (SP expansion I/O interposer 6)		P2-Q6	Node I/O planar (JR1)
Riser card		P2	Node I/O planar (J9)
Node supervisor card		P2-X1	Riser card
Power distribution planar (power planar)		P3	System planar Node I/O planar
Fan control card		P3-X1	Power planar (J21)
3.3-volt PM4 card		P3-V1	Power planar (J20)
Unused		P3-V2	Power planar (J19)
+5SB/+12-volt card		P3-V3	Power planar (J18)
+5/-12-volt card		P3-V4	Power planar (J17)
3.3-volt I/O card		P3-V5	Power planar (J16)
Unused		P3-V6	Power planar (J15)
Base 2.5-volt card		P3-V7	Power planar (J14)
Base 2.5-volt card		P3-V8	Power planar (J13)
3.3-volt PM1 card		P3-V9	Power planar (J12)
Unused		P3-V10	Power planar (J11)
Fan 1		F1	Fan assembly
Fan 2		F2	Fan assembly
Fan 3		F3	Fan assembly
Fan 4		F4	Fan assembly

Table A-9 (Page 3 of 3). POWER3 SMP High Node physical location codes			
FRU Name	**AIX Location Code**	**Physical Location Code**	**Physical Con-nection**
Fan 5		F5	Fan assembly
Fan 6		F6	Fan assembly

SP Expansion I/O Unit location codes

Table A-10. SP Expansion I/O Unit physical location codes			
FRU Name	**AIX Location Code**	**Physical Location Code**	**Physical Con-nection**
I/O planar	00-00	P1	I/O planar
Supervisor card		P1-X1	I/O planar
PCI controllers (0-3)	(See Table A-11)	P1	I/O planar
PCI adapters	(See Table A-12 on page A-51)	P1-I1 to P1-I8	I/O planar
Fan 1 (left side viewed from front)		F1	I/O planar
Fan 2 (right side viewed from front)		F2	I/O planar
Power card (left side viewed from front)		V1	I/O planar
Power card (right side viewed from front)		V2	I/O planar
DASD controller		P2-X1	DASD docking card
DASD docking card		P2	
Node to SP expansion I/O unit connector		P1-Q1	I/O planar / Loop cable
Node to SP expansion I/O unit connector		P1-Q2	I/O planar / Loop cable

Table A-11. SP Expansion I/O Unit PCI controller location codes				
Node Q port	**PCI controller 0** PCI slots I3 and I4	**PCI controller 1** PCI slots I1 and I2	**PCI controller 2** PCI slots I7 and I8	**PCI controller 3** PCI slots I5 and I6
Q2	C880 0000	C890 0000	C8A0 0000	C8B0 0000
Q1	C8C0 0000	C8D0 0000	C8E0 0000	C8F0 0000
Q6	D800 0000	D810 0000	D820 0000	D830 0000
Q5	D840 0000	D850 0000	D860 0000	D870 0000
Q4	D880 0000	D890 0000	D8A0 0000	D8B0 0000
Q3	D8C0 0000	D8D0 0000	D8E0 0000	D8F0 0000

Addressing and location codes for SP Expansion I/O Units are derived from the node "Q" port the unit is physically attached. All SP Expansion I/O Units must be cabled in loops using sequential node port pairs (Q1/Q2, Q3/Q4, or Q5/Q6). When a loop consists of a single SP Expansion I/O Unit, its addressing and location codes are derived from the node **even** numbered Q port connection (Q*even*). When a loop con-

sists of two SP Expansion I/O Units, their individual addressing and location codes are derived from the node Q port to which they are **directly** connected (see Figure A-1 on page A-50).
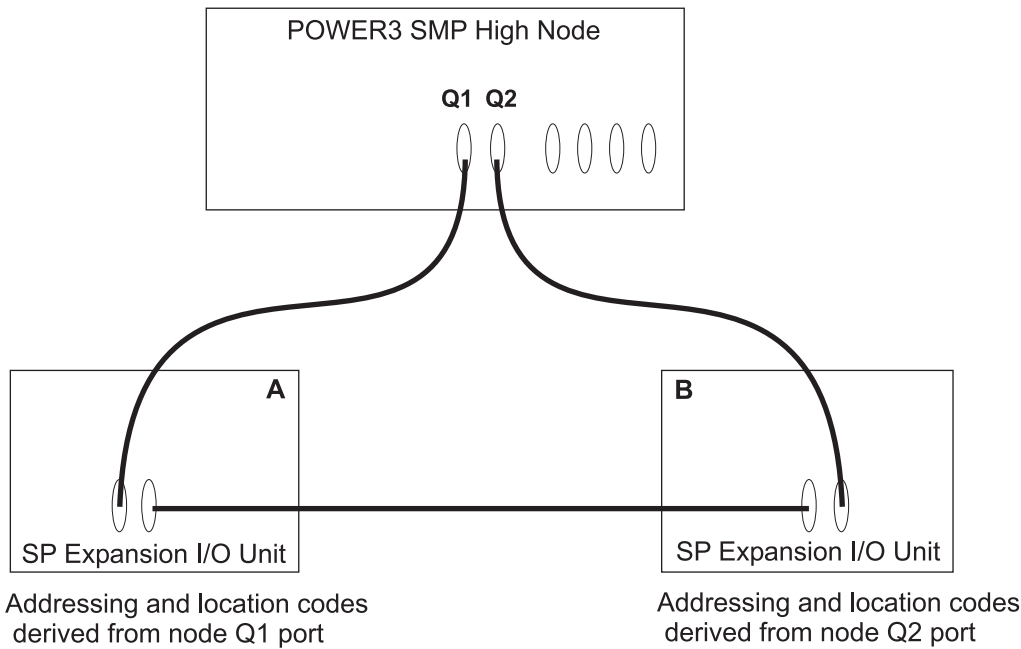
Figure A-1. SP Expansion I/O Unit addressing and location codes

Since the SP Expansion I/O Unit may physically exist anywhere within several SP system frames, the utility SHOW_RIO ("Verifying the POWER3 SMP High Node configuration" on page 3-19) helps locate and associate physical node and physical SP Expansion I/O Unit frame positions with software provided addressing and location codes.

The following table gives the SP Expansion I/O Unit Q number and location code for PCI adapters in an SP Expansion I/O Unit. Use the AIX location code to find the location code and Q number. For example, if the AIX location code given is *E0–65*, find *E0* in the **ab** row and use the appropriate **cd** column, in this case, 65 is in the 60–67 range. The intersecting box shows the Q number and location code (Q1, P1–I2).

Table A-12. SP Expansion I/O Unit PCI adapters location codes				
ab	*cd*		*ab*	*cd*
	58-5F			**60-67**
90 and **9B**	Q2, P1-I3		**90** and **9C**	Q2, P1-I4
A0 and **AB**	Q2, P1-I1		**A0** and **AC**	Q2, P1-I2
B0 and **BB**	Q2, P1-I7		**B0** and **BC**	Q2, P1-I8
C0 and **CB**	Q2, P1-I5		**C0** and **CC**	Q2, P1-I6
D0 and **DB**	Q1, P1-I3		**D0** and **DC**	Q1, P1-I4
E0 and **EB**	Q1, P1-I1		**E0** and **EC**	Q1, P1-I2
F0 and **FB**	Q1, P1-I7		**F0** and **FC**	Q1, P1-I8
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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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This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

United Kingdom telecommunications safety requirements

Notice to customers: This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunications systems in the United Kingdom.

Industry Canada compliance statement

This Class A digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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The following is a summary of the VCCI Japanese statement in the box above. This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

Electromagnetic interference (EMI) statement - Taiwan

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這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user will be required to take adequate measures.

Radio protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit Dem deutschen EMVG vom 9.Nov.92 das EG–Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse A. Für diese von Geräten gilt folgende Bestimmung nach dem EMVG:

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(Auszug aus dem EMVG vom 9.Nov.92, Para.3, Abs.4)

<u>Hinweis</u>

Dieses Genehmigungsverfahren ist von der Deutschen Bundespost noch nicht veröffentlicht worden.

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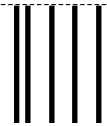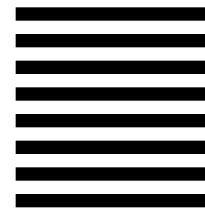Name   Address

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