RS/6000 SP

SMP
Thin and Wide Node
Service Guide

GA22-7447-01

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Note!

Before using this information and the product it supports, read the information in “Safety and environmental notices” on page xiii and “Notices” on page X-1.

Second Edition (February 2000)

This book replaces GA22-7447-00.

This edition applies to Version 3 Release 2 of the IBM Parallel System Support Programs for AIX (PSSP), which runs on the IBM RS/6000 SP, and to all subsequent releases and modifications until otherwise indicated in new editions.

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Safety and environmental notices

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.

Safety notices

The following notices, which appear in the RS/6000 SP hardware service library, describe the safety practices you must observe while working on this equipment.

DANGER notices warn you of conditions or procedures that can result in death or severe personal injury.

CAUTION notices warn you of conditions or procedures that can cause personal injury that is neither lethal nor extremely hazardous.

Safety notices are shown here in English only; for other national languages see *RS/6000 SP: Installation and Relocation*. Each notice contains a reference number (*SPSFXXXX*) which you can use to find a specific notice in a translated version.

Danger notices

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. (*SPSFD001***)**

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. (*SPSFD002***)**

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. (*SPSFD003*)

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. (*SPSFD004*)

DANGER

During an electrical storm, do not connect or disconnect any cable that has a conductive outer surface or a conductive connector. (*SPSFD005*)

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. (*SPSFD006*)

DANGER

To prevent possible electrical shock during machine installation, relocation, or reconfiguration, connect the primary power cable only after connecting all electrical signal cables. (*SPSFD007*)

DANGER

High voltage present. Perform "Lockout safety procedures" to remove primary power to the frame. (*SPSFD008*)

DANGER

High voltage present. Perform "Lockout safety procedures" to remove primary power to the frame (and high-voltage transformer if present). (*SPSFD009*)

DANGER

High voltage present at test points. Use high voltage test probes. (*SPSFD010*)

DANGER

High energy present. Do not short 48V to frame or 48VRtn. Shorting will result in system outage and possible physical injury. (*SPSFD011*)

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. (*SPSFD012*)

DANGER

The remaining steps of the procedure contain measurements that are taken with power on. Remember that hazardous voltages are present. (*SPSFD013*)

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" in *RS/6000 SP: System Service Guide*, **before proceeding. (*SPSFD014*)**

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. (*SPSFD015*)**

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). (*SPSFD016*)

DANGER

Both the SEPBU power chassis and the PDU 48 V dc 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. (*SPSFD017***)**

Caution notices

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. (*SPSFC001***)**

CAUTION:

The unit weight exceeds 18 Kg (40 lbs) and requires two service personnel to lift. (*SPSFC002***)**

CAUTION:

The covers are to be closed at all times except for service by trained service personnel. (*SPSFC003***)**

CAUTION:

When the unit is being serviced, the covers should not be left off or opened while the machine is running unattended. (*SPSFC004***)**

CAUTION:

Due to weight of each thin node (under 18 Kg [40 lbs]), use care when removing and replacing thin nodes above shoulder height. (*SPSFC005***)**

CAUTION:

The wide node weight may exceed 32 Kg (70.5 lbs). (*SPSFC006***)**

CAUTION:

Do not open more than one wide node or switch assembly drawer at a time. (*SPSFC007***)**

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. (*SPSFC008***)**

CAUTION:

Outer edges of chassis may be sharp. Care must be taken when removing and installing chassis. (*SPSFC009***)**

CAUTION:

The ground strip may have sharp edges. (*SPSFC010*)

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. (*SPSFC011*)

CAUTION:

Do not remove the drawer case mounting screws at the bottom of both sides. (*SPSFC012*)

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. (*SPSFC013*)

CAUTION:

Due to the weight of each wide node, use care when sliding and closing wide processor nodes above shoulder height. (*SPSFC014*)

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. (*SPSFC015*)**

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. (*SPSFC016*)

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. (*SPSFC017*)

Environmental design

The environmental efforts that have gone into the design of the system signify IBM's commitment to improve the quality of its products and processes. Some of these accomplishments include the elimination of the use of Class I ozone-depleting chemicals in the manufacturing process, reductions in manufacturing wastes, and increased product energy efficiency. For more information, contact an IBM account representative.

About this book

This book is part of the RS/6000 SP hardware service library. This book applies with the following RS/6000 SP Nodes:

- 332 MHz SMP Thin or Wide Node
- POWER3 SMP Thin or Wide Nodes
  – 200 MHz POWER3 SMP Thin or Wide Node
  – 375 MHz POWER3 SMP Thin or Wide Node

Use this book to assist you in 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

If you are attempting to isolate an SP system failure, use the Maintenance Analysis Procedures (MAPs) beginning with the Start MAP in *IBM RS/6000 SP: System Service Guide* (GA22-7442). For a listing of the complete RS/6000 SP hardware service library, see “Related information.”

Who should use this book

This book is intended for RS/6000 SP product-trained service personnel.

Related information

The following books make up the complete RS/6000 SP hardware service library:

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

As an alternative to ordering the individual books, use GBOF-5437 to order the complete RS/6000 SP hardware service library.

This book and other RS/6000 SP hardware and software documentation are available both on-line and, for some books, 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
- 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 in *RS/6000 SP: Installation and Relocation*.

How To Send Your Comments

Your feedback is important in helping to provide the most accurate and highest quality information. If you have any comments about this book or any other RS/6000 SP documentation:

- Send your comments by e-mail to **mhvrcfs@us.ibm.com**. Be sure to include the name of the book, the order number of the book, and, if applicable, the specific location of the text you are commenting on (for example, a page number or table number).
- Fill out one of the forms at the back of this book and return it by mail, by fax, or by giving it to an IBM representative.

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) for the following RS/6000 SP nodes:

- 332 MHz SMP Thin and Wide Nodes
- 200 MHz POWER3 SMP Thin and Wide Nodes
- 375 MHz POWER3 SMP Thin and Wide Nodes

The MAPs then refer you to the FRU Removal/Replacement procedures for the corrective action.

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 3-2 for more details.) Do not touch the pins or circuitry on these components.

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 "Lockout/tagout procedure for PDU" 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 "Lockout/tagout procedure" on page 1-2 or the "Lockout/bagout procedure" on page 1-2 to completely isolate the frame from the electrical supply.

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" on page 1-1.
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.

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 "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 procedures

Lockout/tagout procedure for PDU: 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.

Lockout/bagout procedure for PDU: 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.

332 MHz SMP Node Thin and Wide Node MAPs

332 MHz SMP Thin and Wide Node environment (MAP 0290)

Note: Refer to "Service position procedures" on page 3-13 for placing a node into the service position or for removing it from the service position.

Step 0290-001: You have detected an environmental problem that is affecting a processor node and "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 0290-002" on page 1-4.
   - If you an observed a system condition that led to your initial diagnosis, go to "Step 0290-005" on page 1-4.

Step 0290-002: 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 0290-004” 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 0290-003.”
     b. If the message **is not** a warning, go to “Step 0290-005.”

Step 0290-003: 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 0290-004” and treating the warning message as a “Shutdown” or “Failure” message.

Step 0290-004: 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. 332 MHz SMP Node environmental conditions

Condition	Action
Any power loss message	Go to “Step 0290-005.”
“...cooling problem...” or fan problem	Go to “Step 0290-022” on page 1-9.
“...memory protect...”	Go to “Step 0290-025” on page 1-10.

Step 0290-005: You have observed a condition that indicates that a power problem exists.

1. Check the node supervisor green LED 1.
2. What is the status node supervisor LED 1?
   - If green LED 1 is On and it **is not** flashing, go to “Step 0290-006” on page 1-5.
   - If green LED 1 is **flashing**, go to “Step 0290-012” on page 1-6.
   - If green LED 1 is **Off**, go to “332 MHz SMP Thin and Wide Node power (MAP 0300)” on page 1-11.

Step 0290-006: Green LED 1 is On and it **is not** flashing.

1. Check the green LEDs on the power supply.
2. Are the power supply's LEDs lit?
   - If yes, go to “Step 0290-010” on page 1-6.
   - If no, go to “Step 0290-007” on page 1-5.

Step 0290-007: Green LED 1 is On but not flashing and the power supply LEDs are off.

1. Verify that the circuit breakers are in the On position.
2. Is the circuit breakers in the On position?
   - If yes, go to “Step 0290-008.”
   - If no:
     a. Set the circuit breakers to the On position.
     b. Return to “Step 0290-005” on page 1-4.

Step 0290-008: The power supply LEDs were not lit but the circuit breakers were in the On position.

1. Verify the 48 V input cables are plugged in at the rear of the node.
2. Is the 48 V power supply cable plugged properly?
   - If yes, go to “Step 0290-009.”
   - If no:
     a. Properly connect the 48–volt power cables.

        Attention: Some 48–volt power cables have in-line circuit breakers. Ensure the in-line circuit breaker switch is in the Off (O) position before connecting or disconnecting 48-volt power cables from the node.
     b. Return to “Step 0290-005” on page 1-4.

Step 0290-009: The power supply LEDs were not lit but the circuit breakers were in the On position and the 48-volt power cables were properly plugged in at the back of the node.

1. Check for 48-volts present at the 332 MHz SMP Node end of the input cables.

   Attention: Some 48-volt power cables have in-line circuit breakers. Ensure the in-line circuit breaker switch is in the Off (O) position before connecting or disconnecting 48-volt power cables from the node.
   - Measure the voltage between the voltage and the return pins.
2. Is there 48 volts present at the connectors?
   - If yes:
     – This indicates that there is a problem with 48–volt sensing.
     – Go to “Step 0290-016” on page 1-7.
   - If no, go to “Step 0290-018” on page 1-8.

Step 0290-010: You have a power problem but both the node supervisor LED 1 and the power supply (green LED) are on.

1. Is the CPU power assembly green LED On but **not** flashing?
   - If yes, go to “Step 0290-011” on page 1-6.
   - If no, go to “Step 0290-012” on page 1-6.

Step 0290-011: The CPU power assembly green LED is On but 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 0290-022” on page 1-9.
   - If no:
     a. Verify that you have the correct processor node.
     b. Go to "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide*.

Step 0290-012: Either LED 1 on the node supervisor or the green LED on the CPU power assembly is indicating a problem.

- If this is a thin node, go to "Main power (MAP 0450)" in *RS/6000 SP: System Service Guide*.
- If this is a wide node, check the green LED on the I/O power assembly.
  1. If this LED is On **or** flashing, go to “Step 0290-013.”
  2. If this LED is **Off**, return to “Step 0290-006” on page 1-5.

  Note: Wide nodes are composed of an I/O Expansion assembly attached to a thin node processor unit. The I/O Expansion assembly (left side) **does not** contain a supervisor card.

Step 0290-013: You have a wide node and the green LED on the I/O power assembly is either On or flashing.

- If the green LED on the I/O power assembly is **On**, go to "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide*.
- If the green LED on the I/O power assembly is **flashing**, check the yellow LEDs on the CPU and I/O power assembly.
  – If the yellow LEDs are **Off**, go to "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide*.
  – If the yellow LEDs are On **or** flashing, go to “Step 0290-014.”

Step 0290-014: The green LED on the I/O power assembly is flashing and the yellow LEDs on CPU and I/O power assembly are either On or flashing.

- If the yellow LEDs are **On**, go to "Frame supervisor not responding (MAP 0110)" in *RS/6000 SP: System Service Guide*.
- If the yellow LEDs are **flashing**, check supervisor LEDs #3 and #4.
  – If **either** supervisor LEDs #3 **or** #4 **is not** flashing, go to "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide*.
  – If **either** supervisor LEDs #3 or #4 **is** flashing:

1. Place the node into the service position.
2. Use Table 1-2 to continue service.

Table 1-2. 332 MHz SMP Node supervisor diagnostics

Priority	Component	Action
1	Interposer connector cable	1. Replace cable 2. Go to "Step 0290-015"
2	Interposer connector card	1. Replace card 2. Go to "Step 0290-015"
3	CPU or I/O power assembly	1. Replace assembly 2. Go to "Step 0290-015"
4	CPU I/O planar	1. Replace I/O planar 2. Go to "Step 0290-015"
5	All replaced	Call next level of support.

Step 0290-015: You performed a service action in Table 1-2.

1. Remove processor node from service position.
2. From the control workstation, power on the processor node.
3. Are supervisor LEDs #3 and/or #4 flashing?
   - If yes, return to Table 1-2 and replace the next highest priority component.
   - If no, go to "Step 0290-021" on page 1-9.

Step 0290-016: One of the following conditions exists:

- LED 1 on the node supervisor is On but the green LED on the power supply is Off. However, you are able to measure 48 volts between the voltage and return pins. This indicates that there is a problem with 48-volt sensing.
- The green LED on the I/O power assembly is flashing and the yellow LEDs on CPU and I/O power assembly are either On or flashing.

1. From the control workstation, power off the processor node.
2. Place the processor node in the service position.
3. Use Table 1-3 on page 1-8 to continue service.

Table 1-3. 332 MHz SMP Node 48-volt sensing diagnostics

Priority	Component	Action
1	Service processor card	1. Replace card 2. Go to "Step 0290-017" on page 1-8
2	I/O expansion control cable	1. Replace cable assembly 2. Go to "Step 0290-017" on page 1-8
3	CPU or I/O power assembly	1. Replace assembly 2. Go to "Step 0290-017" on page 1-8
4	I/O planar	1. Replace planar 2. Go to "Step 0290-017" on page 1-8
5	Power or power/supervisor cable assembly	1. Replace assembly 2. Go to "Step 0290-017" on page 1-8
6	All replaced	Call next level of support.

Step 0290-017: You performed a service action in Table 1-3.

1. Remove processor node from service position.
2. From the control workstation, power on the processor node.
3. Check the green LED on the power supply.
   - If the LED is **Off or flashing**, return to Table 1-3 and replace the next highest priority component.
   - If the LED is **On**, go to "Step 0290-021" on page 1-9.

Step 0290-018: LED 1 on the node supervisor is On but the green LED on the power supply is Off. Also, you **were not** able to measure 48 volts between the voltage and return pins. This indicates that there is a problem with the 48-volt supply.

1. Place the 332 MHz SMP node into the service position.
2. Replace the node supervisor card.
   - Refer to "Replacing the node supervisor card" on page 4-10.
3. Take the 332 MHz SMP node out of the service position.
4. Is the green LED on the power supply Off or flashing?
   - If yes, go to "Step 0290-019."
   - If the power supply LED is **On**, go to "Step 0290-021" on page 1-9.

Step 0290-019: You replaced the node supervisor card but the green LED on the power supply is still Off or flashing.

1. Place the 332 MHz SMP node in service position.
2. Replace the power/supervisor cable assembly.
   - Refer to "Replacing the power/supervisor cable assembly" on page 4-22.
3. Take the 332 MHz SMP node out of the service position.
4. Is the green LED on the power supply Off or flashing?
   - If yes, go to "Step 0290-020" on page 1-9.

- If the power supply LED is **On**, go to “Step 0290-021” on page 1-9.

Step 0290-020: You replaced the node supervisor card and the power/supervisor cable **but** the green LED on the power supply is still Off or flashing.

1. Place the 332 MHz SMP node in service position.
2. Replace the front assembly FRU.
   - Refer to “Replacing the CPU and I/O expansion power assemblies” on page 4-7.
3. Take the 332 MHz SMP node out of the service position.
4. Is the green LED on the power supply Off or flashing?
   - If yes, go to "SEPBU subsystem MAPs" in *RS/6000 SP: System Service Guide*.
   - If the power supply LED is **On**, go to “Step 0290-021.”

Step 0290-021: You were able to correct the problem indicated by the LED status.

1. If necessary, remove the processor node from the service position.
2. Reconnect all cables at rear of the processor node.
3. Put circuit breakers at front of processor node in On (‘1’) position.
4. Go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

Step 0290-022: You have detected a cooling or fan problem with a node.

1. Place the processor node into the service position.
2. Use Table 1-4 to reseat or replace components.

Table 1-4. 332 MHz SMP Node service actions

Priority	Component	Action
1	Fan 1, 2 (3, 4 if 332 MHz SMP Wide Node) **Note:** See Figure 2-5 on page 2-7.	1. Check specified fan for blockage or loose cable connection. Refer to “Power/keylock status register (PKSR)” on page A-60 to decode power register bits. 2. Fix any obvious problem(s). If none are found, continue at Priority 2. 3. Continue at “Step 0290-023” on page 1-10.
2	Fan 1, 2 (3, 4 if 332 MHz SMP Wide Node) **Note:** See Figure 2-5 on page 2-7.	1. Replace fan and/or cooling module as described in “Service procedures for 332 MHz SMP Thin and Wide Nodes” on page 4-3. Refer to “Power/keylock status register (PKSR)” on page A-60 to decode power register bits. 2. Fix any obvious problem(s). 3. Continue at “Step 0290-023” on page 1-10.
3	Front assembly FRU	1. Replace assembly 2. Continue at “Step 0290-023” on page 1-10.
4	Power/supervisor cable assembly	1. Replace assembly 2. Continue at “Step 0290-023” on page 1-10.
7	All replaced	Call next level of support.

Step 0290-023: 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 at the front of processor node in the On ('1') position.
4. Check the error log or SRN.
5. Does the problem still exist?
   - If yes, go to "Step 0290-024."
   - If no:
     a. You have resolved the problem.
     b. Go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

Step 0290-024: You have replaced or reseated a component but the problem still exists.

1. Put circuit breakers at the front of the processor node in the Off ('0') position.
2. Reinstall the previously removed component.
3. Return to "Step 0290-022" on page 1-9 to service the next highest priority component listed in Table 1-4 on page 1-9.

Step 0290-025: 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 0290-027" on page 1-11.
   - If no, go to "Step 0290-026."

Step 0290-026: You received a memory protection error but you **have not** changed any memory components.

1. Problem may be in the:
   - Base memory card
   - CPU card
   - I/O planar
   - Node supervisor control cable
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 "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no, call the next level of support.

Step 0290-027: You **changed** some memory components and now you are receiving a memory protection error.

1. Check memory card and DIMM part numbers in *Diagnostic Information for Multiple Bus Systems* (SA38-0509) and *Adapters, Devices and Cable Information* (SA38-0516) to ensure that they are compatible with the fastest Type 7025 machines.

   Note: Return to this procedure to continue service.

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

332 MHz SMP Thin and Wide Node power (MAP 0300)

Note: Refer to "Service position procedures" on page 3-13 for placing nodes into the service position or for removing them from the service position.

Step 0300-001: You have detected a power problem in either a 332 MHz SMP Thin or Wide Node and "Processor node diagnostics and descriptions (MAP 0130) in *RS/6000 SP: System Service Guide* directed you to this procedure.

1. Ensure all circuit breakers for this node (power assembly and 48-volt in-line) are in the ON ('1') position.
2. Is this a wide node or a thin node?
   - If this is a wide node, go to "Step 0300-002."
   - If this is a thin node, go to "Step 0300-003."

   Note: Wide nodes are composed of an I/O Expansion assembly attached to a thin node processor unit. The I/O Expansion assembly (left side) **does not** contain a supervisor card.

Step 0300-002: You have a 332 MHz SMP Wide Node with a power problem. Make certain that the I/O power assembly power interlock bar and tab are engaged correctly. If they are correctly engaged, go to "Step 0300-003." Otherwise:

1. Reseat the I/O power assembly.
2. Make certain that the power interlock bar and tab are engaged correctly.
3. Have the problem symptoms changed?
   - If yes, go to "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide*.
   - If no, go to "Step 0300-003."

Step 0300-003: You have a 332 MHz SMP Thin Node with a power problem or a 332 MHz SMP Wide Node in which you have eliminated the I/O power assembly as the source of the power problem.

1. Check green LED 1 on the node supervisor.
2. What is the status of node supervisor LED 1?
   - If green LED 1 is **Off**, go to "Step 0300-013" on page 1-14.
   - If green LED 1 is **flashing**, go to "Step 0300-004" on page 1-12.
   - If green LED 1 is On and it **is not** flashing, you do not have a problem with the power supply.
     a. Verify that you have the proper processor node.
     b. Go to "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide*.

Step 0300-004: LED 1 (green) on the node supervisor card is flashing. this indicates that the processor node getting 48 V dc power however a problem exists in the supply.

Attention: Some 48-volt power cables have inline circuit breakers. Ensure the inline circuit breaker switch is in the Off (O) position before connecting or disconnecting 48-volt power cables from the node.

1. Make certain that **all**:
   - 48-volt power supply cables are connected.
   - Cable circuit breakers are in the On position.
2. Check:
   - Node supervisor LED 3 on 332 MHz SMP Thin Nodes.
   - Node supervisor LED 3 **and** 4 on 332 MHz SMP Wide Nodes.
3. What is the status of the LEDs on the node supervisor card?
   - If either LED 3 or 4 is **Off**, go to "Step 0300-008" on page 1-13.
   - If the LEDs are On **or** flashing, go to "Step 0300-005."

Step 0300-005: LED 3 on a 332 MHz SMP Thin Node or LED 3 and 4 on a 332 MHz SMP Wide Node are either On or flashing. This indicates that the processor node is getting power.

1. Power On the RS/6000 logic from the control workstation using the Perspectives Node Status window.
2. Does green LED 1 light and stay lit?
   - If yes, go to "Step 0300-007."
   - If no, go to "Step 0300-006."

Step 0300-006: Node supervisor LED 3 and 4 (on wide nodes) indicate that the processor node is getting power but LED 1 **does not** stay lit.

1. Make certain that the front assembly power interlock bars **and** power interlock tabs are engaged properly.
2. Are the power interlock bars and tabs engaged properly?
   - If yes:
     a. This indicates that you may have an electrical short.
     b. Go to "332 MHz SMP Thin and Wide Node minimum configuration (MAP 0320)" on page 1-27.
   - If no:
     a. Engage the front assembly power interlock bars and power interlock tabs.
     b. Go to "Step 0300-010" on page 1-13.

Step 0300-007: Node supervisor LED 3 and 4 (on wide nodes) are On or flashing and LED 1 lights and stays lit. This indicates the RS/6000 logic is getting power.

1. Does the node IPL properly?
   - If yes:
     a. No problem detected.
     b. Record reason for power-off condition.

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

- If no:
  a. Processor node has IPL problem.
  b. Go to "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide*.

Step 0300-008: All 48-volt power supply cables are connected and the inline circuit breakers are On but LED 3 on a 332 MHz SMP Thin Node or LED 3 or 4 on a 332 MHz SMP Wide Node were Off.

1. Check the yellow LED on the power supply.
2. Is the yellow LED On?
   - If yes, go to "Step 0300-009."
   - If no, go to "Step 0300-011."

Step 0300-009: LED 3 on a 332 MHz SMP Thin Node or LED 3 or 4 on a 332 MHz SMP Wide Node were Off but the yellow LED on the power supply is On. This indicates that +48-volt power is present.

1. What is the status of the power supply's power (green) LED?
   - If the green LED is **flashing**, go to "Step 0300-010."
   - If the green LED is On and it **is not** flashing, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If the green LED is **Off**:
     – If this is the first time through this step:
       a. Exchange the power supply.
       b. Return to "Step 0300-008."
     – If this is the second time through this step, go to "332 MHz SMP Thin and Wide Node minimum configuration (MAP 0320)" on page 1-27.

Step 0300-010: LED 3 on a 332 MHz SMP Thin Node or LED 3 and 4 on a 332 MHz SMP Wide Node were Off but the yellow LED on the power supply is On and the green LED is flashing.

1. Switch the circuit breaker Off, then On.
2. Did the green LED light and the node IPL?
   - If yes, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no, go to 332 MHz SMP Thin and Wide Node environment (MAP 0290), "Step 0290-016" on page 1-7.

Step 0300-011: LED 3 on a 332 MHz SMP Thin Node or LED 3 and 4 on a 332 MHz SMP Wide Node were Off and the yellow LED on the power supply is also Off.

1. Make certain that the circuit breaker is On.
2. Was the circuit breaker On?
   - If yes:
     a. 48-volt power is not being supplied to the node.
     b. Go to 332 MHz SMP Thin and Wide Node environment (MAP 0290), "Step 0290-008" on page 1-5.

- If the circuit breaker **was not** in the On position, go to “Step 0300-012” on page 1-14.

Step 0300-012: The yellow LED on the power supply is off and the circuit breaker is in the Off position.

1. Place the circuit breaker into the On position.
2. Does the circuit breaker switch On **and** stay in the On position?
   - If yes, return to “Step 0300-003” on page 1-11.
   - If the circuit breaker switched On **but then tripped** Off:
     a. You may have a power supply problem or an electrical short.
     b. Go to “Step 0300-016” on page 1-15.
   - If the circuit breaker **would not** switch On:
     a. Repair or replace the circuit breaker.
     b. Return to “Step 0300-008” on page 1-13.

Step 0300-013: You arrived at this procedure from “Step 0300-003” on page 1-11 where you found LED 1 on the node supervisor card was off.

1. Check LED 5 (yellow) on the node supervisor card.
2. Is LED 5 Off?
   - If yes, go to “Step 0300-014.”
   - If LED 5 **is lit**:
     a. This indicates that the base code loaded on the node supervisor needs to be updated.
        – Refer to “Updating the node supervisor code” on page 3-13.
     b. Go to “Step 0300-019” on page 1-16.

Step 0300-014: LED 5 (yellow) on the node supervisor card is off.

1. Check the green LED on the power supply.
2. Is the green LED also off?
   - If yes, go to “Step 0300-015.”
   - If the green LED on the power supply **is lit**, go to 332 MHz SMP Thin and Wide Node environment (MAP 0290), “Step 0290-006” on page 1-5.

Step 0300-015: Both LED 5 on the node supervisor card and the green LED on the power supply are off.

1. Check the circuit breakers at front of the power supplies.
   - If needed, put these circuit breakers in the On (‘1’) position.
2. Do the circuit breakers go (trip) to the Off (‘0’) position?
   - If yes, go to “Step 0300-016” on page 1-15.
   - If no, go to “Step 0300-019” on page 1-16.

Step 0300-016: The power supply circuit breaker is tripping to the Off ('0') position. This indicates that you have a power supply problem or an electrical short.

1. Place processor node in service position.

   Attention: Some 48-volt power cables have inline circuit breakers. Ensure the inline circuit breaker switch is in the Off (O) position before connecting or disconnecting 48-volt power cables from the node.

2. Check the 48-volt bulk power harnesses for any obvious problems which might cause a short at the following locations:
   - The power supplies at the rear of the node
   - All circuit breaker connections
   - All 48-volt bulk power connections
3. Does everything appear to be okay?
   - If yes, go to "Step 0300-017."
   - If no:
     a. Fix any obvious problems.
     b. Remove the processor node from the service position.
     c. Reconnect all cables at rear of the processor node.
     d. Return to "Step 0300-015" on page 1-14.

Step 0300-017: You received an indication that there is either a problem with the power supply or that there is an electrical short in the system however, everything appears to be okay after a visual inspection.

1. Using a multimeter, check for an electrical short between the pins of the 48-volt input connectors (J8 at the rear of the node).
2. Did you detect an electrical short?
   - If yes, go to "Step 0300-018" on page 1-16.
   - If no:
     a. Disconnect the 48-volt power cables from the SEPBU bulkhead.
     b. Using a multimeter, check for an electrical short between:
        – The pins in the 48-volt power cables.
        – Any pins in the node power plugs.
        – If a short is detected, replace the 48-volt power cable.
     c. Using a multimeter, check for an electrical short between any tabs in the circuit breakers.
        – If a short is detected, isolate it to either the cable or the circuit breaker and replace the corresponding part.
     d. Remove processor node from the service position.
     e. Reconnect all cables at the rear of the processor node.
     f. Return to "Step 0300-015" on page 1-14.

Step 0300-018: You found an electrical short between the pins of the 48-volt input connectors (J8 at the rear of the node).

1. Using a multimeter, check for an electrical short between the pins of the power/supervisor connector at the rear of the front assembly.
2. Did you detect an electrical short?
   - If you **found** an electrical short:
     a. Replace the corresponding power supply.
     b. Remove the processor node from the service position.
     c. Reconnect all cables at the rear of processor node.
     d. Return to "Step 0300-015" on page 1-14.
   - If you **did not** find an electrical short:
     a. Replace the power/supervisor cable assembly in the logic part of the node.
     b. Remove the processor node from the service position.
     c. Reconnect all cables at the rear of the processor node.
     d. Return to "Step 0300-015" on page 1-14.

Step 0300-019: You have arrived at this procedure from either:

- "Step 0300-013" on page 1-14 where you updated the base code on the node supervisor card.
- "Step 0300-015" on page 1-14 where you found the green LED on the power supply was on and the circuit breakers **did not** trip to the Off position.

You now have to determine if the power problem is resolved or if additional diagnostic action is needed.

1. From control workstation or processor node, check LED 1 (green) on the node supervisor.
2. Is node supervisor LED 1 off or do you see 'No Power to Node' displayed on the control workstation?
   - If yes, go to "Step 0300-020."
   - If LED 1 is lit or you **do not** receive any power messages on the control workstation:
     a. You have resolved the problem.
     b. Go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

Step 0300-020: LED 1 on the node supervisor is off or you are receiving a 'No Power to Node' message on the control workstation.

1. Check any processor nodes connected to another dc power harness to see if they are powered on.
   - Make certain that the other processor nodes have their circuit breakers in the On ('1') position.

   Note: 332 MHz SMP Nodes receive 48-volt power by connecting a power cable between the node and the SEPBU bulkhead following the order listed below:

   ```
   PDU-BH-P1:   Processor nodes  1, 2, 3, 4
   PDU-BH-P2:   Processor nodes  5, 6, 7, 8
   PDU-BH-P3:   Processor nodes  9, 10, 11, 12
   PDU-BH-P4:   Processor nodes 13, 14, 15, 16
   PDU-BH-P21:  first  SMP Node  1
   PDU-BH-P22:  Second SMP Node  5
   PDU-BH-P23:  Third  SMP Node  9
   PDU-BH-P24:  Fourth SMP Node 13
   ```

2. On the other processor nodes, check the green LED 1 on the node supervisor for an On or Flashing condition.
3. Is LED 1 on any other processor node On or flashing?
   - If yes, go to “Step 0300-021.”
   - If no, go to "Main power (MAP 0450)" in *RS/6000 SP: System Service Guide*.

Step 0300-021: When you looked at processor nodes connected to other 48-volt power harnesses, you saw that LED 1 on the other nodes' supervisor cards were On or flashing.

1. Check all other processor nodes on the same dc power harness as the failing processor node.
   - Look for the same symptom as the failing node - the circuit breaker is in the On position but LED 1 is not lit.
2. Is the failing processor node the only node showing this symptom?
   - If yes, go to “Step 0300-022.”
   - If no:
     a. This indicates that there is a problem with the 48 V dc power distribution.
     b. Go to "Open in 48V dc distribution (MAP 0560)" in *RS/6000 SP: System Service Guide*.

Step 0300-022: Only the failing processor has the symptom – the circuit breaker is in the On position but LED 1 is not lit.

1. Check the cable connections at the rear of the processor node and at the 48-volt power distribution connection.
2. Is there a good connection?
   - If yes, go to “Step 0300-023.”
   - If no:
     a. Fix the cable connection problem.
     b. Return to “Step 0300-019” on page 1-16.

Step 0300-023: All 48-volt connections to the processor node are good and the circuit breaker on the failing processor node is in the On position but LED 1 is not lit.

1. Put the 48-volt input cable inline circuit breakers in the “On” (1) position.
2. Check for 48-volts at the 332 MHz SMP Node end of the input cables.
   - Measure between the voltage and the return pins.
3. Is there 48 volts present at the connectors?
   - If yes, go to “Step 0300-025” on page 1-18.
   - If no, go to “Step 0300-024.”

Step 0300-024: You were not able to measure 48-volts across the voltage and return pins.

1. Voltage is missing at the input cables.
2. Replace the 48-volt input cables.
3. Are you able to measure 48-volts at the connector end?
   - If yes, go to “Step 0300-025” on page 1-18.

- If no, go to "Open in 48V dc distribution (MAP 0560)" in *RS/6000 SP: System Service Guide*.

Step 0300-025: You are able to measure 48-volts at the node end of the power cable.

1. Check the green LEDs on the power supply and make certain that the cooling fans are functioning.
2. Are the power supply LEDs On and the cooling fans functioning?
   - If yes, return to “Step 0300-003” on page 1-11.
   - If no, go to 332 MHz SMP Thin and Wide Node environment (MAP 0290), “Step 0290-006” on page 1-5.

332 MHz SMP Thin and Wide Node control (MAP 0310)

Attention: If a 332 MHz SMP Thin or Wide 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 circuit breaker(s) to 48-volt bulkhead connectors for actual power distribution.

Attention: The processor node(s) must be removed from active configuration before continuing. If processor node(s) is/are off, continue; otherwise, ask customers to initiate shutdown procedure and power-off processor node(s) from the control workstation, or defer maintenance until all jobs are completed. Powering off a processor node(s) 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 SP Switch feature installed, will impact the entire switch network, unless the processor node has already been powered off (or fenced) and/or the switch data cable has been disconnected.

Note: Refer to “Service position procedures” on page 3-13 for placing processor nodes into the service position or for removing them from the service position.

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

Step 0310-001: You have detected a control problem in either a 332 MHz SMP Thin or Wide Node and "Processor node diagnostics and descriptions (MAP 0130) in *RS/6000 SP: System Service Guide* directed you to this procedure. Use Table 1-5 on page 1-19 to continue service.

Table 1-5. 332 MHz SMP Thin or Wide Node control diagnostics

Condition	Action
• Problem with node power	Go to "332 MHz SMP Thin and Wide Node environment (MAP 0290)" on page 1-3.
• Perspectives "LCD or LED" display is missing segments or remains blank	Go to "Step 0310-018" on page 1-24.
• Node will not reset	Go to "Step 0310-002" on page 1-19.
• No response from TTY console	• Close existing TTY window and open another. • Go to "Step 0310-011" on page 1-22.
• Yellow or green LEDs on node will not light.	Go to "Step 0310-021" on page 1-26.

Step 0310-002: A 332 MHz SMP Thin or Wide Node will not reset and Table 1-5 directed you to this procedure.

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 at this time, 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 the node reset?
   - If yes, go to "Step 0310-003."
   - If no, go to "Step 0310-004" on page 1-20.

Step 0310-003: You have a node that would not reset. However, you **were** able to reset it from Perspectives. This indicates that the node may have an intermittent problem.

1. Please record the following information:
   - Node number
   - Date and time the fault was 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 0310-009" on page 1-21.
   - If this **is not** a recurring problem, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

Step 0310-004: The processor node would not reset from Perspectives.

1. If necessary, open a Perspectives Hardware session.
   a. Select the Node Status tab.
   b. Click the power off button.
   c. From the new window, select "Shutdown"
   d. Click "Apply"
   e. After shutdown is complete, use the Node Status page to restart the node.
   f. While node restarts, check the LCDs for sequence indicating IPL.
2. Does the LCD sequence indicate successful IPL?
   - If yes, go to “Step 0310-005.”
   - If no:
     a. Node supervisor card not responding to commands.
     b. Go to "Frame supervisor not responding (MAP 0110)" in *RS/6000 SP: System Service Guide*.

Step 0310-005: 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 0310-006.”
   - 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 "Step 0140-004" of that MAP to continue service.

Step 0310-006: The LCD sequence indicates that IPL went to completion.

1. From the Perspectives Node Status window, click on the “Open TTY” button to open a TTY console.
2. From the TTY console:
   - Issue the command: **diag**
   - Select “Advanced Diagnostic Routines”
   - Select “System Verification”
   - Select “Base System”.
3. Does this test indicate a failure?
   - If yes, go to “Step 0310-009” on page 1-21.
   - If no, go to “Step 0310-007.”

Step 0310-007: The advanced diagnostics **did not** indicate a failure.

1. If necessary, open a Hardware Perspectives session from the control workstation.
2. Reset the nodes from Perspectives.
   a. Select the Node Status tab.
   b. Click the power off button.
   c. From the new window, select "Reset"
   d. Click "Apply"

3. Does the processor node reset?
   - If yes, go to “Step 0310-008.”
   - If no, go to “Step 0310-009.”

Step 0310-008: The advanced diagnostics test passed and you were able to reset the node.

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 "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no:
     a. This is an intermittent problem, record the following information:
        – Node number
        – Date and time fault was reported
        – Type of fault reported
        – Action taken or component replaced
     b. Go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

Step 0310-009: You have an intermittent problem **or** the advanced diagnostics system verification indicated a failure **or** you have a problem with 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 1-6 to continue service:

Table 1-6. 332 MHz SMP Thin or Wide Node advanced diagnostics

Priority	Component	Action
1	Cable between frame supervisor and node supervisor card	1. Check for proper seating and opens/shorts. If no problem is found, continue at Priority 2. 2. Repair or replace cable assembly as required. 3. Go to “Step 0310-010” to verify fix.
2	Node supervisor card	1. Check for proper seating and opens/shorts. If no problem is found, continue at Priority 3. 2. Repair or replace cable assembly as required. 3. Go to “Step 0310-010” to verify fix.
3	I/O Planar Board	1. Replace board. 2. Go to “Step 0310-010” to verify fix.
4	All replaced	Call next level of support.

Step 0310-010: You repaired or replaced a component as directed in Table 1-6.

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 0310-005” on page 1-20 to continue service.

Step 0310-011: You were not able to obtain a response from a TTY session and Table 1-5 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

      - 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 0310-012.”
   - If the TTY **is not** responding due to the customer's system configuration:
     a. The customer must reconfigure these parameters.
     b. Go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

Step 0310-012: 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 0310-015” on page 1-23.
   - If no, go to “Step 0310-013” on page 1-23.

Step 0310-013: 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 0310-014" on page 1-23.
   - If no, go to "Step 0310-015" on page 1-23.

Step 0310-014: 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 0310-016" on page 1-24.
   - If no, go to "Step 0310-015."

Step 0310-015: 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. If needed, log into the node over the Ethernet:

   telnet *nodename*
2. Return the console to tty0. Do this by entering the following command:

   chcons /dev/tty0
3. From the control workstation, open a Perspectives session displaying the Node Status window.
4. Close the TTY session.
5. Have the customer remove the processor node from the active system configuration and power off the processor node.
6. Put the circuit breaker on the processor node into the Off ('0') position.
7. Place processor node into the service position.
8. Refer to Table 1-7 for priority of replacement or repair of components.

Table 1-7. 332 MHz SMP Thin or Wide 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 0310-016" on page 1-24 to verify fix.
2	I/O planar	1. Replace I/O planar. 2. Perform "Verification Test for Supervisor Bus" in *RS/6000 SP: System Service Guide*. 3. Go to "Step 0310-016" on page 1-24 to verify fix.
3	Cables between frame supervisor and node supervisor card	1. Replace cable. 2. Go to "Step 0310-016" on page 1-24 to verify fix.
4	All replaced	Call next level of support.

Step 0310-016: 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 breakers at the front 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 0310-017.”
   - If no:
     a. Return to “Step 0310-015” on page 1-23.
     b. Continue service at the next priority level.

Step 0310-017: 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 “Base System” option.
5. Does the processor node pass all diagnostic tests?
   - If yes:
     a. You have resolved the problem.
     b. Go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no:
     a. Repair the problem indicated by the diagnostics.
     b. Use "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide* if necessary.

Step 0310-018: 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 all processor node circuit breakers into the Off (‘0’) position.
3. Place the processor node into the service position.
4. Refer to Table 1-8 on page 1-25 for priority of replacement or repair of components.

Table 1-8. 332 MHz SMP Thin or Wide Node LCD diagnostics

Priority	Component	Action
1	Cable between frame supervisor and 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 0310-019" on page 1-25 to verify fix.
2	Node supervisor card	1. Check for proper seating. If no problem found, continue at Priority 3. 2. Repair or replace cable assembly as required. 3. Go to "Step 0310-019" on page 1-25 to verify fix.
3	I/O Planar Board	1. Replace board. 2. Go to "Step 0310-019" on page 1-25 to verify fix.
4	All Replaced	Call next level of support.

Step 0310-019: You have repaired or replaced a component.

1. Remove the processor node from the 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 0310-020."
   - If no:
     a. Return to "Step 0310-018" on page 1-24.
     b. Continue service at the next priority level.

Step 0310-020: 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 "Base System" option.
5. Does the processor node pass all diagnostic tests?
   - If yes:
     a. You have resolved the problem.
     b. Go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no:
     a. Repair the problem indicated by the diagnostics.
     b. Use "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide* if necessary.

Step 0310-021: You have observed that the yellow or green LED on the node supervisor is not functioning and Table 1-5 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/Switch Supervisor Self-Test."
   - Ignore any PASS/FAIL results you may receive.
   - Refer to "Node supervisor self-test" on page 3-10.
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 0310-025" on page 1-27.
   - If no, go to "Step 0310-022."

Step 0310-022: 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/Switch Supervisor Self-Test."
   - Refer to "Node supervisor self-test" on page 3-10.
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 0310-024."
   - If no, go to "Step 0310-023."

Step 0310-023: 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/Switch Supervisor Self-Test."
   - Refer to "Node supervisor self-test" on page 3-10.
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 "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no, go to "Step 0310-024."

Step 0310-024: You replaced the LED display card. However, LEDs of the same color on both the front of the node and on the node supervisor card still **do not** light at any time.

1. Replace the node supervisor card.
2. Perform "Node/Switch Supervisor Self-Test" to verify replacement.
   - Refer to "Node supervisor self-test" on page 3-10.

3. Go to “Step 0310-025” on page 1-27.

Step 0310-025: 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 "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

332 MHz SMP Thin and Wide Node minimum configuration (MAP 0320)

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 FRUs are exchanged one at a time until the failing one is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

Attention: The node must be placed into Service Position prior to handling logic/power parts. The node must be removed from Service Position prior to attempting to answer "Does the node IPL?". For removal and replacement of logic/power parts, refer to Chapter 4, “FRU removals and replacements” on page 4-1.

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 file system is fully or partially on the disconnected DASD. In this case, the node will only boot to a code in the range **517-518** or **551-557**; 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 assembly chassis to the CPU assembly chassis.

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

Step 0320-001: Physically identify the 332 MHz SMP node type:

- If you have a 332 MHz SMP Thin Node, go to “Step 0320-008” on page 1-29.
- If you have a 332 MHz SMP Wide Node, go to “Step 0320-002.”

  Note: Wide nodes are composed of an I/O Expansion assembly attached to a thin node processor unit. The I/O Expansion assembly (left side) **does not** contain a supervisor card.

Step 0320-002: To determine which 332 MHz SMP Wide Node assembly is failing, you must first split the CPU assembly from the I/O Expansion assembly and IPL the "thin node" section.

1. Disconnect all 4-drop SCSI connectors from the I/O Expansion assembly DASD.
2. Remove all adapter cards from the CPU assembly.
3. Disconnect the PCI riser card cable from J6 on the CPU assembly I/O planar.
4. Disconnect the I/O Expansion control cable from J2 on the CPU assembly I/O planar.
5. Remove the screws securing the CPU assembly chassis to the I/O Expansion assembly chassis, then separate the two chassis.
6. Reinstall all CPU assembly adapter cards.

7. Does the thin node section (CPU assembly) IPL properly?
   - If yes, go to “Step 0320-003.”
   - If no:
     a. The problem is in the thin node section.
     b. Go to “Step 0320-008” on page 1-29.

Step 0320-003: You were able to IPL the thin node section of a 332 MHz SMP Wide Node. This indicates that the failure is likely in the I/O Expansion assembly. Use this procedure to reassemble the 332 MHz SMP Wide Node, place the I/O Expansion assembly into its minimum configuration, and continue diagnosing the problem.

1. Remove all adapters from the CPU and I/O Expansion assemblies.
2. Reinstall the I/O Expansion assembly to the CPU assembly.
3. Route the PCI riser card cable through the chassis-wall cut-outs and reconnect the cable to J6 on the CPU assembly I/O planar.
4. Route the I/O Expansion control cable through the chassis-wall cut-outs and reconnect the cable to J2 on the CPU assembly I/O planar.
5. Reinstall all CPU assembly adapter cards.
6. Reconnect all 4-drop SCSI cable connectors to their respective I/O Expansion assembly DASD.
7. Does the node IPL properly?
   - If yes, go to “Step 0320-004.”
   - If no:
     a. The problem is likely in the minimum configured I/O Expansion assembly.
     b. Go to “Step 0320-016” on page 1-31.

Step 0320-004: With the I/O Expansion assembly in its minimum configuration, you were able to IPL the reassembled 332 MHz SMP Wide Node.

1. One at a time, reinstall and test all the I/O Expansion assembly adapter cards that you previously removed in “Step 0320-003.”
2. Does the node IPL properly?
   - If yes, go to “Step 0320-007” on page 1-29.
   - If no, go to “Step 0320-005.”

Step 0320-005: You reinstalled an adapter card into the I/O Expansion assembly of a 332 MHz SMP Wide Node but you **were not** able to IPL the node. This indicates that the card you just **reinstalled** has failed.

1. **Replace** the failing card.
2. Does the node IPL properly?
   - If yes:
     a. Return to “Step 0320-004” and reinstall the next adapter card.
     b. If all cards have been reinstalled, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no:

a. The replacement card you installed has also failed and may indicate a problem with the I/O Expansion assembly planar.

b. Go to “Step 0320-006.”

Step 0320-006: The 332 MHz SMP Wide Node failed to IPL properly after both the reinstalled adapter card (“Step 0320-004” on page 1-28) and its replacement adapter card (“Step 0320-005” on page 1-28) were installed in the I/O Expansion assembly.

- **Replace** the I/O Expansion assembly planar.
- Does the node IPL properly?
  - If yes, go to “Step 0320-004” on page 1-28.
  - If no, call the next level of support.

Step 0320-007: You reinstalled an adapter card in the I/O Expansion assembly of a 332 MHz SMP Wide Node and you **were able** to IPL the node. This indicates that the reinstalled card is okay.

- Return to “Step 0320-004” on page 1-28 and reinstall the next adapter card.
- If all cards have been reinstalled, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

Step 0320-008: You have a failing 332 MHz SMP Thin Node or a 332 MHz SMP Wide Node that has a problem in the thin node section and you need to place the unit into its minimum configuration. Use this procedure to place the Thin Node or thin node section into minimum configuration and then continue diagnosing the problem.

1. Remove all memory cards from the system planar.
2. Populate **one** memory card with DIMMs in J1 and J2 **only** (refer to “332 MHz SMP Thin and Wide Node locations” on page 2-7), then install that memory card in either memory slot 1 or 2.
3. Ensure that a CPU card is installed in CPU slot 1.
4. If a CPU card is installed in CPU slot 2, remove it.
5. Remove all CPU assembly adapter cards.
6. Does the node IPL properly?
   - If yes, go to “Step 0360-010” on page 1-59.
   - If no, go to “Step 0360-009” on page 1-59.

Step 0320-009: You have placed a 332 MHz SMP Thin Node or the thin node section of a 332 MHz SMP Wide Node into minimum configuration but the node still **does not** IPL properly.

1. One at a time, **replace** the following components and IPL the node.
   - Memory DIMMs
   - Memory card
   - CPU card
   - Service processor card
   - Boot DASD
   - SCSI cable (2- or 4-drop)
   - I/O planar

- System planar
- Flat ribbon power cable

2. Does the node IPL properly?
   - If yes, go to “Step 0320-010.”
   - If no:
     a. Replace the next component listed in this step.
     b. If you have replaced all listed components, call next level of support.

Step 0320-010: You were able to properly IPL a 332 MHz SMP Thin Node or the thin node section of a 332 MHz SMP Wide Node after you placed it into minimum configuration. You must now reinstall and test the components you removed to place the node into minimum configuration.

1. One at a time, **reinstall** and test the components removed in “Step 0320-008” on page 1-29.
2. Does the node IPL properly?
   - If yes, go to “Step 0320-013” on page 1-31.
   - If no, go to “Step 0320-011.”

Step 0320-011: You reinstalled a component in a 332 MHz SMP Thin Node or the thin node section of a 332 MHz SMP Wide Node but you **were not** able to IPL the node. This indicates that the component you just **reinstalled** has failed.

1. **Replace** the failing component.
2. Does the node IPL properly?
   - If yes:
     a. Return to “Step 0320-010” and reinstall the next component.
     b. If all components have been reinstalled, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no:
     a. The replacement component you installed in this slot has failed and may indicate a problem with the component's planar.
     b. Go to “Step 0320-012.”

Step 0320-012: You arrived at this step from “Step 0320-011” because a thin node (or CPU assembly section of a wide node) failed to IPL after installation of a replacement component.

1. **Replace** the (system or I/O) planar to which the failing replacement component was installed.
2. Does the node IPL properly?
   - If yes, return to “Step 0320-010” .
   - If no, call the next level of support.

Step 0320-013: You reinstalled a component in a 332 MHz SMP Thin Node or the thin node section of a 332 MHz SMP Wide Node and you **were able** to IPL the node. This indicates that the reinstalled component is okay.

1. Return to “Step 0320-010” and reinstall the next component.
2. If all components have been replaced, and this is a 332 MHz SMP Thin Node, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
3. If all components have been replaced, and this is a thin node section of a 332 MHz SMP Wide Node, go to “Step 0320-014.”

Step 0320-014: You arrived here from “Step 0320-013” because the repaired thin node section of the 332 MHz SMP Wide Node can now IPL, and the I/O expansion assembly, separated in “Step 0320-002” on page 1-27, must now be reattached and tested.

1. **Remove** all adapter cards from the CPU assembly.
2. Reinstall the I/O Expansion assembly to the CPU assembly.
3. Route the I/O Expansion control cable through the chassis-wall cut-outs and reconnect the cable to J2 on the CPU assembly I/O planar.
4. Route the PCI riser card cable through the chassis-wall cut-outs and reconnect the cable to J6 on the CPU assembly I/O planar.
5. Reinstall all CPU assembly adapter cards.
6. Reconnect all 4-drop SCSI cable connectors to their respective I/O Expansion assembly DASDs.
7. Does the node IPL properly?
   - If yes, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no, go to “Step 0320-015.”

Step 0320-015: The reassembled 332 MHz SMP Wide Node does not IPL properly. Use this procedure to place the I/O Expansion assembly into its minimum configuration and continue testing.

1. **Remove** all adapter cards from the I/O Expansion assembly.
2. Does the node IPL properly?
   - If yes, go to “Step 0320-004” on page 1-28.
   - If no:
     a. The problem is likely in the minimum configured I/O Expansion assembly.
     b. Go to “Step 0320-016.”

Step 0320-016: You have determined that the minimum configured I/O Expansion assembly of a 332 MHz SMP Wide Node is likely failing.

1. **Replace** the I/O Expansion assembly control cable.
2. Does the node IPL properly?
   - If yes, go to “Step 0320-004” on page 1-28.
   - If no, go to “Step 0320-017” on page 1-32.

Step 0320-017: You replaced the I/O Expansion control cable and **were not** able to IPL the minimum configured 332 MHz SMP Wide Node.

1. **Replace** the I/O Expansion PCI riser card.
2. Does the node IPL properly?
   - If yes, return to "Step 0320-004" on page 1-28.
   - If no, go to "Step 0320-018."

Step 0320-018: You replaced the I/O Expansion PCI riser card and **were not** able to IPL the minimum configured 332 MHz SMP Wide Node.

1. **Replace** the I/O Expansion planar.
2. Does the node IPL properly?
   - If yes, return to "Step 0320-004" on page 1-28.
   - If no, go to "Step 0320-019."

Step 0320-019: You replaced the I/O Expansion assembly planar and **were not** able to IPL the minimum configured 332 MHz SMP Wide Node.

1. **Replace** the I/O Expansion assembly interposer adapter **cable**.
2. Does the node IPL properly?
   - If yes, return to "Step 0320-004" on page 1-28.
   - If no, go to "Step 0320-020."

Step 0320-020: You replaced the I/O Expansion assembly interposer adapter **cable** and **were not** able to IPL the minimum configured 332 MHz SMP Wide Node.

1. **Replace** the I/O Expansion assembly interposer adapter **card**.
2. Does the node IPL properly?
   - If yes, return to "Step 0320-004" on page 1-28.
   - If no, go to "Step 0320-021."

Step 0320-021: You replaced the I/O Expansion assembly interposer adapter **card** and **were not** able to IPL the minimum configured 332 MHz SMP Wide Node.

1. **Replace** the I/O Expansion assembly power supply.
2. Does the node IPL properly?
   - If yes, return to "Step 0320-004" on page 1-28.
   - If no, call the next level of support.

POWER3 SMP Thin and Wide Node MAPs

Use the following MAPs to isolate problems in 200 MHz POWER3 SMP Thin and Wide Nodes and 375 MHz POWER3 SMP Thin and Wide Nodes.

POWER3 SMP Thin and Wide Node environment (MAP 0330)

Note: Refer to "Service position procedures" on page 3-13 for placing a node into the service position or for removing it from the service position.

Step 0330-001: You have detected an environmental problem that is affecting a processor node and "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 0330-002."
   - If you an observed a system condition that led to your initial diagnosis, go to "Step 0330-005" on page 1-34.

Step 0330-002: 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 0330-004."
   - 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 0330-003."
     b. If the message **is not** a warning, go to "Step 0330-005" on page 1-34.

Step 0330-003: 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 0330-004" and treating the warning message as a "Shutdown" or "Failure" message.

Step 0330-004: 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 1-9 on page 1-34 to continue service.

Table 1-9. POWER3 SMP Thin and Wide Node environmental conditions

Condition	Action
Any power loss message	Go to "Step 0330-005" on page 1-34.
"...cooling problem..." or fan problem	Go to "Step 0330-022" on page 1-38.
"...memory protect..."	Go to "Step 0330-025" on page 1-40.

Step 0330-005: You have observed a condition that indicates that a power problem exists.

1. Check the node supervisor green LED 1.
2. What is the status of node supervisor LED 1?
   - If green LED 1 is On and it **is not** flashing, go to "Step 0330-006."
   - If green LED 1 is **flashing**, go to "Step 0330-012" on page 1-35.
   - If green LED 1 is **Off**, go to "POWER3 SMP Thin and Wide Node power (MAP 0340)" on page 1-40.

Step 0330-006: Green LED 1 is On and it **is not** flashing.

1. Check the green LEDs on the power supply.
2. Are the power supply's LEDs lit?
   - If yes, go to "Step 0330-010" on page 1-35.
   - If no, go to "Step 0330-007."

Step 0330-007: Green LED 1 is On but not flashing and the power supply LEDs are off.

1. Verify that the circuit breakers are in the On position.
2. Is the circuit breakers in the On position?
   - If yes, go to "Step 0330-008."
   - If no:
     a. Set the circuit breakers to the On position.
     b. Return to "Step 0330-005."

Step 0330-008: The power supply LEDs were not lit but the circuit breakers were in the On position.

1. Verify the 48 V input cables are plugged in at the rear of the node.
2. Is the 48 V power supply cable plugged properly?
   - If yes, go to "Step 0330-009" on page 1-35.
   - If no:
     a. Properly connect the 48–volt power cables.

        Attention: Some 48-volt power cables have in-line circuit breakers. Ensure the in-line circuit breaker switch is in the Off (O) position before connecting or disconnecting 48-volt power cables from the node.

     b. Return to "Step 0330-005."

Step 0330-009: The power supply LEDs were not lit but the circuit breakers were in the On position and the 48-volt power cables were properly plugged in at the back of the node.

1. Check for 48-volts present at the POWER3 SMP Thin and Wide Node end of the input cables.

   Attention: Some 48-volt power cables have in-line circuit breakers. Ensure the in-line circuit breaker switch is in the Off (O) position before connecting or disconnecting 48-volt power cables from the node.

   - Measure the voltage between the voltage and the return pins.
2. Is there 48 volts present at the connectors?
   - If yes:
     – This indicates that there is a problem with 48–volt sensing.
     – Go to “Step 0330-016” on page 1-37.
   - If no, go to “Step 0330-018” on page 1-37.

Step 0330-010: You have a power problem but both the node supervisor LED 1 and the power supply (green LED) are on.

1. Is the CPU power assembly green LED On but **not** flashing?
   - If yes, go to “Step 0330-011.”
   - If no, go to “Step 0330-012.”

Step 0330-011: The CPU power assembly green LED is On but 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 0330-022” on page 1-38.
   - If no:
     a. Verify that you have the correct processor node.
     b. Go to "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide*.

Step 0330-012: Either LED 1 on the node supervisor or the green LED on the CPU power assembly is indicating a problem.

- If this is a thin node, go to "Main power (MAP 0450)" in *RS/6000 SP: System Service Guide*.
- If this is a wide node, check the green LED on the I/O power assembly.
  1. If this LED is On **or** flashing, go to “Step 0330-013” on page 1-36.
  2. If this LED is **Off**, return to “Step 0330-006” on page 1-34.

  Note: Wide nodes are composed of an I/O Expansion assembly attached to a thin node processor unit. The I/O Expansion assembly (left side) **does not** contain a supervisor card.

Step 0330-013: You have a wide node and the green LED on the I/O power assembly is either On or flashing.

- If the green LED on the I/O power assembly is **On**, go to "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide*.
- If the green LED on the I/O power assembly is **flashing**, check the yellow LEDs on the CPU and I/O power assembly.
  – If the yellow LEDs are **Off**, go to "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide*.
  – If the yellow LEDs are On **or** flashing, go to "Step 0330-014."

Step 0330-014: The green LED on the I/O power assembly is flashing and the yellow LEDs on CPU and I/O power assembly are either On or flashing.

- If the yellow LEDs are **On**, go to "Frame supervisor not responding (MAP 0110)" in *RS/6000 SP: System Service Guide*.
- If the yellow LEDs are **flashing**, check supervisor LEDs #3 and #4.
  – If **either** supervisor LEDs #3 **or** #4 **is not** flashing, go to "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide*.
  – If **either** supervisor LEDs #3 or #4 **is** flashing:
    1. Place the node into the service position.
    2. Use Table 1-10 to continue service.

Table 1-10. POWER3 SMP Thin and Wide Node supervisor diagnostics

Priority	Component	Action
1	Interposer connector cable	1. Replace cable 2. Go to "Step 0330-015"
2	Interposer connector card	1. Replace card 2. Go to "Step 0330-015"
3	CPU or I/O power assembly	1. Replace assembly 2. Go to "Step 0330-015"
4	CPU I/O planar	1. Replace I/O planar 2. Go to "Step 0330-015"
5	All replaced	Call next level of support.

Step 0330-015: You performed a service action in Table 1-10.

1. Remove processor node from service position.
2. From the control workstation, power on the processor node.
3. Are supervisor LEDs #3 and/or #4 flashing?
   - If yes, return to Table 1-10 and replace the next highest priority component.
   - If no, go to "Step 0330-021" on page 1-38.

Step 0330-016: One of the following conditions exists:

- LED 1 on the node supervisor is On but the green LED on the power supply is Off. However, you are able to measure 48 volts between the voltage and return pins. This indicates that there is a problem with 48-volt sensing.
- The green LED on the I/O power assembly is flashing and the yellow LEDs on CPU and I/O power assembly are either On or flashing.

1. From the control workstation, power off the processor node.
2. Place the processor node in the service position.
3. Use Table 1-11 to continue service.

Table 1-11. POWER3 SMP Thin and Wide Node 48–volt sensing diagnostics

Priority	Component	Action
1	I/O expansion control cable	1. Replace cable assembly 2. Go to "Step 0330-017"
2	CPU or I/O power assembly	1. Replace assembly 2. Go to "Step 0330-017"
3	I/O planar	1. Replace planar 2. Go to "Step 0330-017"
4	Power or power/supervisor cable assembly	1. Replace assembly 2. Go to "Step 0330-017"
5	All replaced	Call next level of support.

Step 0330-017: You performed a service action in Table 1-11.

1. Remove processor node from service position.
2. From the control workstation, power on the processor node.
3. Check the green LED on the power supply.
   - If the LED is **Off or flashing**, return to Table 1-11 and replace the next highest priority component.
   - If the LED is **On**, go to "Step 0330-021" on page 1-38.

Step 0330-018: LED 1 on the node supervisor is On but the green LED on the power supply is Off. Also, you **were not** able to measure 48 volts between the voltage and return pins. This indicates that there is a problem with the 48-volt supply.

1. Place the POWER3 SMP Thin or Wide Node into the service position.
2. Replace the node supervisor card.
   - Refer to "Replacing the node supervisor card" on page 4-31.
3. Take the POWER3 SMP Thin or Wide Node out of the service position.
4. Is the green LED on the power supply Off or flashing?
   - If yes, go to "Step 0330-019" on page 1-38.
   - If the power supply LED is **On**, go to "Step 0330-021" on page 1-38.

Step 0330-019: You replaced the node supervisor card but the green LED on the power supply is still Off or flashing.

1. Place the POWER3 SMP Thin or Wide Node in service position.
2. Replace the power/supervisor cable assembly.
   - Refer to “Replacing the power/supervisor cable assembly” on page 4-42.
3. Take the POWER3 SMP Thin or Wide Node out of the service position.
4. Is the green LED on the power supply Off or flashing?
   - If yes, go to “Step 0330-020.”
   - If the power supply LED is **On**, go to “Step 0330-021.”

Step 0330-020: You replaced the node supervisor card and the power/supervisor cable **but** the green LED on the power supply is still Off or flashing.

1. Place the POWER3 SMP Thin or Wide Node in service position.
2. Replace the front assembly FRU.
   - Refer to “Replacing the CPU and I/O expansion power assemblies” on page 4-28.
3. Take the POWER3 SMP Thin or Wide Node out of the service position.
4. Is the green LED on the power supply Off or flashing?
   - If yes, go to "SEPBU subsystem MAPs" in *RS/6000 SP: System Service Guide*.
   - If the power supply LED is **On**, go to “Step 0330-021.”

Step 0330-021: You were able to correct the problem indicated by the LED status.

1. If necessary, remove the processor node from the service position.
2. Reconnect all cables at rear of the processor node.
3. Put circuit breakers at front of processor node in On (‘1’) position.
4. Go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

Step 0330-022: You have detected a cooling or fan problem with a node.

1. Place the processor node into the service position.
2. Use Table 1-12 on page 1-39 to reseat or replace components.

Table 1-12. POWER3 SMP Thin and Wide Node service actions

Priority	Component	Action
1	Fan 1, 2 (3, 4 if POWER3 SMP Wide Node) **Note:** See Figure 2-14 on page 2-12.	1. Check specified fan for blockage or loose cable connection. Refer to “Power/keylock status register (PKSR)” on page A-60 to decode power register bits. 2. Fix any obvious problem(s). If none are found, continue at Priority 2. 3. Continue at “Step 0330-023” on page 1-39.
2	Fan 1, 2 (3, 4 if POWER3 SMP Wide Node) **Note:** See Figure 2-14 on page 2-12.	1. Replace fan and/or cooling module as described in “Service procedures for POWER3 SMP Thin and Wide Nodes” on page 4-25. Refer to “Power/keylock status register (PKSR)” on page A-60 to decode power register bits. 2. Fix any obvious problem(s). 3. Continue at “Step 0330-023” on page 1-39.
3	Front assembly FRU	1. Replace assembly 2. Continue at “Step 0330-023” on page 1-39.
4	Power/supervisor cable assembly	1. Replace assembly 2. Continue at “Step 0330-023” on page 1-39.
7	All replaced	Call next level of support.

Step 0330-023: 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 at the front of processor node in the On (‘1’) position.
4. Check the error log or SRN.
5. Does the problem still exist?
   - If yes, go to “Step 0330-024.”
   - If no:
     a. You have resolved the problem.
     b. Go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

Step 0330-024: You have replaced or reseated a component but the problem still exists.

1. Put circuit breakers at the front of the processor node in the Off (‘0’) position.
2. Reinstall the previously removed component.
3. Return to “Step 0330-022” on page 1-38 to service the next highest priority component listed in Table 1-12.

Step 0330-025: You received a memory protection error and Table 1-9 on page 1-34 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 0330-027" on page 1-40.
   - If no, go to "Step 0330-026."

Step 0330-026: You received a memory protection error but you **have not** changed any memory components.

1. Problem may be in the:
   - Base memory card
   - CPU card
   - I/O planar
   - Node supervisor control cable
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 "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no, call the next level of support.

Step 0330-027: You **changed** some memory components and now you are receiving a memory protection error.

1. Check memory card and DIMM part numbers in *Diagnostic Information for Multiple Bus Systems* (SA38-0509) and *Adapters, Devices and Cable Information* (SA38-0516) to ensure that they are compatible with the fastest Type 7043 machines.

   Note: Return to this procedure to continue service.
2. If necessary, call the next level of support.

POWER3 SMP Thin and Wide Node power (MAP 0340)

Note: Refer to "Service position procedures" on page 3-13 for placing nodes into the service position or for removing them from the service position.

Step 0340-001: You have detected a power problem in either a POWER3 SMP Thin or Wide Node and "Processor node diagnostics and descriptions (MAP 0130) in *RS/6000 SP: System Service Guide* directed you to this procedure.

1. Ensure all circuit breakers for this node (power assembly and 48-volt in-line) are in the ON ('1') position.
2. Is this a wide node or a thin node?
   - If this is a wide node, go to "Step 0340-002" on page 1-41.
   - If this is a thin node, go to "Step 0340-003" on page 1-41.

Note: Wide nodes are composed of an I/O Expansion assembly attached to a thin node processor unit. The I/O Expansion assembly (left side) **does not** contain a supervisor card.

Step 0340-002: You have a POWER3 SMP Wide Node with a power problem. Make certain that the I/O power assembly power interlock bar and tab are engaged correctly. If they are correctly engaged, go to “Step 0340-003.” Otherwise:

1. Reseat the I/O power assembly.
2. Make certain that the power interlock bar and tab are engaged correctly.
3. Have the problem symptoms changed?
   - If yes, go to "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide*.
   - If no, go to “Step 0340-003.”

Step 0340-003: You have a POWER3 SMP Thin Node with a power problem or a POWER3 SMP Wide Node in which you have eliminated the I/O power assembly as the source of the power problem.

1. Check green LED 1 on the node supervisor.
2. What is the status of node supervisor LED 1?
   - If green LED 1 is **Off**, go to “Step 0340-013” on page 1-44.
   - If green LED 1 is **flashing**, go to “Step 0340-004.”
   - If green LED 1 is On and it **is not** flashing, you do not have a problem with the power supply.
     a. Verify that you have the proper processor node.
     b. Go to "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide*.

Step 0340-004: LED 1 (green) on the node supervisor card is flashing. this indicates that the processor node getting 48 V dc power however a problem exists in the supply.

Attention: Some 48-volt power cables have inline circuit breakers. Ensure the inline circuit breaker switch is in the Off (O) position before connecting or disconnecting 48-volt power cables from the node.

1. Make certain that **all**:
   - 48-volt power supply cables are connected.
   - Cable circuit breakers are in the On position.
2. Check:
   - Node supervisor LED 3 on POWER3 SMP Thin Nodes.
   - Node supervisor LED 3 **and** 4 on POWER3 SMP Wide Nodes.
3. What is the status of the LEDs on the node supervisor card?
   - If either LED 3 or 4 **Off**, go to “Step 0340-008” on page 1-42.
   - If the LEDs are On **or** flashing, go to “Step 0340-005” on page 1-42.

Step 0340-005: LED 3 on a POWER3 SMP Thin Node or LED 3 and 4 on a POWER3 SMP Wide Node are either On or flashing. This indicates that the processor node is getting power.

1. Power On the RS/6000 logic from the control workstation using the Perspectives Node Status window.
2. Does green LED 1 light and stay lit?
   - If yes, go to "Step 0340-007" on page 1-42.
   - If no, go to "Step 0340-006."

Step 0340-006: Node supervisor LED 3 and 4 (on wide nodes) indicate that the processor node is getting power but LED 1 **does not** stay lit.

1. Make certain that the front assembly power interlock bars **and** power interlock tabs are engaged properly.
2. Are the power interlock bars and tabs engaged properly?
   - If yes:
     a. This indicates that you may have an electrical short.
     b. Go to "POWER3 SMP Thin and Wide Node minimum configuration (MAP 0360)" on page 1-56.
   - If no:
     a. Engage the front assembly power interlock bars and power interlock tabs.
     b. Go to "Step 0340-010" on page 1-43.

Step 0340-007: Node supervisor LED 3 and 4 (on wide nodes) are On or flashing and LED 1 lights and stays lit. This indicates the RS/6000 logic is getting power.

1. Does the node IPL properly?
   - If yes:
     a. No problem detected.
     b. Record reason for power-off condition.
     c. Go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no:
     a. Processor node has IPL problem.
     b. Go to "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide*.

Step 0340-008: All 48-volt power supply cables are connected and the inline circuit breakers are On but LED 3 on a POWER3 SMP Thin Node or LED 3 or 4 on a POWER3 SMP Wide Node were Off.

1. Check the yellow LED on the power supply.
2. Is the yellow LED On?
   - If yes, go to "Step 0340-009" on page 1-43.
   - If no, go to "Step 0340-011" on page 1-43.

Step 0340-009: LED 3 on a POWER3 SMP Thin Node or LED 3 or 4 on a POWER3 SMP Wide Node were Off but the yellow LED on the power supply is On. This indicates that +48-volt power is present.

1. What is the status of the power supply's power (green) LED?
   - If the green LED is **flashing**, go to “Step 0340-010” on page 1-43.
   - If the green LED is On and it **is not** flashing, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If the green LED is **Off**:
     – If this is the first time through this step:
       a. Exchange the power supply.
       b. Return to “Step 0340-008” on page 1-42.
     – If this is the second time through this step, go to “POWER3 SMP Thin and Wide Node minimum configuration (MAP 0360)” on page 1-56.

Step 0340-010: LED 3 on a POWER3 SMP Thin Node or LED 3 and 4 on a POWER3 SMP Wide Node were Off but the yellow LED on the power supply is On and the green LED is flashing.

1. Switch the circuit breaker Off, then On.
2. Did the green LED light and the node IPL?
   - If yes, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no, go to POWER3 SMP Thin and Wide Node environment (MAP 0330), “Step 0330-016” on page 1-37.

Step 0340-011: LED 3 on a POWER3 SMP Thin Node or LED 3 and 4 on a POWER3 SMP Wide Node were Off and the yellow LED on the power supply is also Off.

1. Make certain that the circuit breaker is On.
2. Was the circuit breaker On?
   - If yes:
     a. 48-volt power is not being supplied to the node.
     b. Go to POWER3 SMP Thin and Wide Node environment (MAP 0330), “Step 0330-008” on page 1-34.
   - If the circuit breaker **was not** in the On position, go to “Step 0340-012.”

Step 0340-012: The yellow LED on the power supply is off and the circuit breaker is in the Off position.

1. Place the circuit breaker into the On position.
2. Does the circuit breaker switch On **and** stay in the On position?
   - If yes, return to “Step 0340-003” on page 1-41.
   - If the circuit breaker switched On **but then tripped** Off:
     a. You may have a power supply problem or an electrical short.
     b. Go to “Step 0340-016” on page 1-44.
   - If the circuit breaker **would not** switch On:

a. Repair or replace the circuit breaker.

b. Return to "Step 0340-008" on page 1-42.

Step 0340-013: You arrived at this procedure from "Step 0340-003" on page 1-41 where you found LED 1 on the node supervisor card was off.

1. Check LED 5 (yellow) on the node supervisor card.
2. Is LED 5 Off?
   - If yes, go to "Step 0340-014."
   - If LED 5 **is lit**:
     a. This indicates that the base code loaded on the node supervisor needs to be updated.
        – Refer to "Updating the node supervisor code" on page 3-13.
     b. Go to "Step 0340-019" on page 1-46.

Step 0340-014: LED 5 (yellow) on the node supervisor card is off.

1. Check the green LED on the power supply.
2. Is the green LED also off?
   - If yes, go to "Step 0340-015."
   - If the green LED on the power supply **is lit**, go to POWER3 SMP Thin and Wide Node environment (MAP 0330), "Step 0330-006" on page 1-34.

Step 0340-015: Both LED 5 on the node supervisor card and the green LED on the power supply are off.

1. Check the circuit breakers at front of the power supplies.
   - If needed, put these circuit breakers in the On ('1') position.
2. Do the circuit breakers go (trip) to the Off ('0') position?
   - If yes, go to "Step 0340-016."
   - If no, go to "Step 0340-019" on page 1-46.

Step 0340-016: The power supply circuit breaker is tripping to the Off ('0') position. This indicates that you have a power supply problem or an electrical short.

1. Place processor node in service position.

   Attention: Some 48-volt power cables have inline circuit breakers. Ensure the inline circuit breaker switch is in the Off (O) position before connecting or disconnecting 48-volt power cables from the node.
2. Check the 48-volt bulk power harnesses for any obvious problems which might cause a short at the following locations:
   - The power supplies at the rear of the node
   - All circuit breaker connections
   - All 48-volt bulk power connections
3. Does everything appear to be okay?
   - If yes, go to "Step 0340-017" on page 1-45.

- If no:
  a. Fix any obvious problems.
  b. Remove the processor node from the service position.
  c. Reconnect all cables at rear of the processor node.
  d. Return to "Step 0340-015" on page 1-44.

Step 0340-017: You received an indication that there is either a problem with the power supply or that there is an electrical short in the system however, everything appears to be okay after a visual inspection.

1. Using a multimeter, check for an electrical short between the pins of the 48-volt input connectors (J8 at the rear of the node).
2. Did you detect an electrical short?
   - If yes, go to "Step 0340-018."
   - If no:
     a. Disconnect the 48-volt power cables from the SEPBU bulkhead.
     b. Using a multimeter, check for an electrical short between:
        – The pins in the 48-volt power cables.
        – Any pins in the node power plugs.
        – If a short is detected, replace the 48-volt power cable.
     c. Using a multimeter, check for an electrical short between any tabs in the circuit breakers.
        – If a short is detected, isolate it to either the cable or the circuit breaker and replace the corresponding part.
     d. Remove processor node from the service position.
     e. Reconnect all cables at the rear of the processor node.
     f. Return to "Step 0340-015" on page 1-44.

Step 0340-018: You found an electrical short between the pins of the 48-volt input connectors (J8 at the rear of the node).

1. Using a multimeter, check for an electrical short between the pins of the power/supervisor connector at the rear of the front assembly.
2. Did you detect an electrical short?
   - If you **found** an electrical short:
     a. Replace the corresponding power supply.
     b. Remove the processor node from the service position.
     c. Reconnect all cables at the rear of processor node.
     d. Return to "Step 0340-015" on page 1-44.
   - If you **did not** find an electrical short:
     a. Replace the power/supervisor cable assembly in the logic part of the node.
     b. Remove the processor node from the service position.
     c. Reconnect all cables at the rear of the processor node.

d. Return to "Step 0340-015" on page 1-44.

Step 0340-019: You have arrived at this procedure from either:

- "Step 0340-013" on page 1-44 where you updated the base code on the node supervisor card.
- "Step 0340-015" on page 1-44 where you found the green LED on the power supply was on and the circuit breakers **did not** trip to the Off position.

You now have to determine if the power problem is resolved or if additional diagnostic action is needed.

1. From control workstation or processor node, check LED 1 (green) on the node supervisor.
2. Is node supervisor LED 1 off or do you see 'No Power to Node' displayed on the control workstation?
   - If yes, go to "Step 0340-020."
   - If LED 1 is lit or you **do not** receive any power messages on the control workstation:
     a. You have resolved the problem.
     b. Go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

Step 0340-020: LED 1 on the node supervisor is off or you are receiving a 'No Power to Node' message on the control workstation.

1. Check any processor nodes connected to another dc power harness to see if they are powered on.
   - Make certain that the other processor nodes have their circuit breakers in the On ('1') position.

   Note: POWER3 SMP Thin and Wide Nodes receive 48-volt power by connecting a power cable between the node and the SEPBU bulkhead following the order listed below:

   ```
   PDU-BH-P1:   Processor nodes  1, 2, 3, 4
   PDU-BH-P2:   Processor nodes  5, 6, 7, 8
   PDU-BH-P3:   Processor nodes  9, 10, 11, 12
   PDU-BH-P4:   Processor nodes 13, 14, 15, 16
   PDU-BH-P21:  first  SMP Node  1
   PDU-BH-P22:  Second SMP Node  5
   PDU-BH-P23:  Third  SMP Node  9
   PDU-BH-P24:  Fourth SMP Node 13
   ```

2. On the other processor nodes, check the green LED 1 on the node supervisor for an On or Flashing condition.
3. Is LED 1 on any other processor node On or flashing?
   - If yes, go to "Step 0340-021."
   - If no, go to "Main power (MAP 0450)" in *RS/6000 SP: System Service Guide*.

Step 0340-021: When you looked at processor nodes connected to other 48-volt power harnesses, you saw that LED 1 on the other nodes' supervisor cards were On or flashing.

1. Check all other processor nodes on the same dc power harness as the failing processor node.
   - Look for the same symptom as the failing node - the circuit breaker is in the On position but LED 1 is not lit.
2. Is the failing processor node the only node showing this symptom?
   - If yes, go to "Step 0340-022" on page 1-47.
   - If no:
     a. This indicates that there is a problem with the 48 V dc power distribution.

b. Go to "Open in 48V dc distribution (MAP 0560)" in *RS/6000 SP: System Service Guide*.

Step 0340-022: Only the failing processor has the symptom – the circuit breaker is in the On position but LED 1 is not lit.

1. Check the cable connections at the rear of the processor node and at the 48-volt power distribution connection.
2. Is there a good connection?
   - If yes, go to "Step 0340-023."
   - If no:
     a. Fix the cable connection problem.
     b. Return to "Step 0340-019" on page 1-46.

Step 0340-023: All 48-volt connections to the processor node are good and the circuit breaker on the failing processor node is in the On position but LED 1 is not lit.

1. Put the 48-volt input cable inline circuit breakers in the "On" (1) position.
2. Check for 48-volts at the POWER3 SMP Node end of the input cables.
   - Measure between the voltage and the return pins.
3. Is there 48 volts present at the connectors?
   - If yes, go to "Step 0340-025."
   - If no, go to "Step 0340-024."

Step 0340-024: You were not able to measure 48-volts across the voltage and return pins.

1. Voltage is missing at the input cables.
2. Replace the 48-volt input cables.
3. Are you able to measure 48-volts at the connector end?
   - If yes, go to "Step 0340-025."
   - If no, go to "Open in 48V dc distribution (MAP 0560)" in *RS/6000 SP: System Service Guide*.

Step 0340-025: You are able to measure 48-volts at the node end of the power cable.

1. Check the green LEDs on the power supply and make certain that the cooling fans are functioning.
2. Are the power supply LEDs On and the cooling fans functioning?
   - If yes, return to "Step 0340-003" on page 1-41.
   - If no, go to POWER3 SMP Thin and Wide Node environment (MAP 0330), "Step 0330-006" on page 1-34.

POWER3 SMP Thin and Wide Node control (MAP 0350)

Attention: If a POWER3 SMP Thin or Wide 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 circuit breaker(s) to 48-volt bulkhead connectors for actual power distribution.

Attention: The processor node(s) must be removed from active configuration before continuing. If processor node(s) is/are off, continue; otherwise, ask customers to initiate shutdown procedure and power-off processor node(s) from the control workstation, or defer maintenance until all jobs are completed. Powering off a processor node(s) 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 SP Switch feature installed, will impact the entire switch network, unless the processor node has already been powered off (or fenced) and/or the switch data cable has been disconnected.

Note: Refer to “Service position procedures” on page 3-13 for placing nodes into the service position or for removing them from the service position.

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

Step 0350-001: You have detected a control problem in either a POWER3 SMP Thin or Wide Node and "Processor node diagnostics and descriptions (MAP 0130) in *RS/6000 SP: System Service Guide* directed you to this procedure. Use Table 1-13 to continue service.

Table 1-13. POWER3 SMP Thin or Wide Node control diagnostics

Condition	Action
• Problem with node power	Go to “POWER3 SMP Thin and Wide Node environment (MAP 0330)” on page 1-33.
• Perspectives "LCD or LED" display is missing segments or remains blank	Go to “Step 0350-018” on page 1-54.
• Node will not reset	Go to “Step 0350-002.”
• No response from TTY console	• Close existing TTY window and open another. • Go to “Step 0350-011” on page 1-51.
• Yellow or green LEDs on node will not light.	Go to “Step 0350-021” on page 1-55.

Step 0350-002: A POWER3 SMP Thin or Wide 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 at this time, 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 the node reset?

- If yes, go to “Step 0350-003” on page 1-49.
- If no, go to “Step 0350-004.”

Step 0350-003: You have a node that would not reset. However, you **were** able to reset it from Perspectives. This indicates that the node may have an intermittent problem.

1. Please record the following information:
   - Node number
   - Date and time the fault was 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 0350-009” on page 1-50.
   - If this **is not** a recurring problem, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

Step 0350-004: The processor node would not reset from Perspectives.

1. If necessary, open a Perspectives Hardware session.
   a. Select the Node Status tab.
   b. Click the power off button.
   c. From the new window, select "Shutdown"
   d. Click "Apply"
   e. After shutdown is complete, use the Node Status page to restart the node.
   f. While node restarts, check the LCDs for sequence indicating IPL.
2. Does the LCD sequence indicate successful IPL?
   - If yes, go to “Step 0350-005.”
   - If no:
     a. Node supervisor card not responding to commands.
     b. Go to "Frame supervisor not responding (MAP 0110)" in *RS/6000 SP: System Service Guide*.

Step 0350-005: 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 0350-006” on page 1-50.
   - 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 "Step 0140-004" of that MAP to continue service.

Step 0350-006: The LCD sequence indicates that IPL went to completion.

1. From the Perspectives Node Status window, click on the “Open TTY” button to open a TTY console.
2. From the TTY console:
   - Issue the command: **diag**
   - Select “Advanced Diagnostic Routines”
   - Select “System Verification”
   - Select “Base System”.
3. Does this test indicate a failure?
   - If yes, go to “Step 0350-009.”
   - If no, go to “Step 0350-007.”

Step 0350-007: The advanced diagnostics **did not** indicate a failure.

1. If necessary, open a Hardware Perspectives session from the control workstation.
2. Reset the nodes from Perspectives.
   a. Select the Node Status tab.
   b. Click the power off button.
   c. From the new window, select "Reset"
   d. Click "Apply"
3. Does the processor node reset?
   - If yes, go to “Step 0350-008.”
   - If no, go to “Step 0350-009.”

Step 0350-008: The advanced diagnostics test passed and you were able to reset the node.

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 "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no:
     a. This is an intermittent problem, record the following information:
        – Node number
        – Date and time fault was reported
        – Type of fault reported
        – Action taken or component replaced
     b. Go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

Step 0350-009: You have an intermittent problem **or** the advanced diagnostics system verification indicated a failure **or** you have a problem with 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 1-14 on page 1-51 to continue service:

Table 1-14. POWER3 SMP Thin or Wide Node advanced diagnostics

Priority	Component	Action
1	Cable between frame supervisor and node supervisor card	1. Check for proper seating and opens/shorts. If no problem is found, continue at Priority 2. 2. Repair or replace cable assembly as required. 3. Go to "Step 0350-010" on page 1-51 to verify fix.
2	Node supervisor card	1. Check for proper seating and opens/shorts. If no problem is found, continue at Priority 3. 2. Repair or replace cable assembly as required. 3. Go to "Step 0350-010" on page 1-51 to verify fix.
3	I/O Planar Board	1. Replace board. 2. Go to "Step 0350-010" on page 1-51 to verify fix.
4	All replaced	Call next level of support.

Step 0350-010: You repaired or replaced a component as directed in Table 1-14.

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 0350-005" on page 1-49 to continue service.

Step 0350-011: You were not able to obtain a response from a TTY session.

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

      - 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 0350-012" on page 1-52.
   - If the TTY **is not** responding due to the customer's system configuration:
     a. The customer must reconfigure these parameters.
     b. Go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

Step 0350-012: 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 0350-015.”
   - If no, go to “Step 0350-013.”

Step 0350-013: 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 0350-014.”
   - If no, go to “Step 0350-015.”

Step 0350-014: 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 0350-016” on page 1-53.
   - If no, go to “Step 0350-015.”

Step 0350-015: 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. If needed, log into the node over the Ethernet:

   telnet *nodename*

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

   chcons /dev/tty0

3. From the control workstation, open a Perspectives session displaying the Node Status window.
4. Close the TTY session.
5. Have the customer remove the processor node from the active system configuration and power off the processor node.
6. Put the circuit breaker on the processor node into the Off (‘0’) position.
7. Place processor node into the service position.
8. Refer to Table 1-15 on page 1-53 for priority of replacement or repair of components.

Table 1-15. POWER3 SMP Thin or Wide 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 0350-016" on page 1-53 to verify fix.
2	I/O planar	1. Replace I/O planar. 2. Perform "Verification Test for Supervisor Bus" in *RS/6000 SP: System Service Guide*. 3. Go to "Step 0350-016" on page 1-53 to verify fix.
3	Cables between frame supervisor and node supervisor card	1. Replace cable. 2. Go to "Step 0350-016" on page 1-53 to verify fix.
4	All replaced	Call next level of support.

Step 0350-016: 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 breakers at the front 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 0350-017."
   - If no:
     a. Return to "Step 0350-015" on page 1-52.
     b. Continue service at the next priority level.

Step 0350-017: 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 "Base System" option.
5. Does the processor node pass all diagnostic tests?
   - If yes:
     a. You have resolved the problem.
     b. Go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no:
     a. Repair the problem indicated by the diagnostics.
     b. Use "Processor node diagnostics and descriptions (MAP 0130)" in *RS/6000 SP: System Service Guide* if necessary.

Step 0350-018: 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 all processor node circuit breakers into the Off ('0') position.
3. Place the processor node into the service position.
4. Refer to Table 1-16 for priority of replacement or repair of components.

Table 1-16. POWER3 SMP Thin or Wide Node LCD diagnostics

Priority	Component	Action
1	Cable between frame supervisor and 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 0350-019" to verify fix.
2	Node supervisor card	1. Check for proper seating. If no problem found, continue at Priority 3. 2. Repair or replace cable assembly as required. 3. Go to "Step 0350-019" to verify fix.
3	I/O Planar Board	1. Replace board. 2. Go to "Step 0350-019" to verify fix.
4	All Replaced	Call next level of support.

Step 0350-019: You have repaired or replaced a component.

1. Remove the processor node from the 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 0350-020."
   - If no:
     a. Return to "Step 0350-018."
     b. Continue service at the next priority level.

Step 0350-020: 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 "Base System" option.
5. Does the processor node pass all diagnostic tests?
   - If yes:
     a. You have resolved the problem.

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

- If no:

  a. Repair the problem indicated by the diagnostics.

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

Step 0350-021: You have observed that the yellow or green LED on the node supervisor is not functioning and Table 1-13 on page 1-48 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/Switch Supervisor Self-Test."
   - Ignore any PASS/FAIL results you may receive.
   - Refer to "Node supervisor self-test" on page 3-10.
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 0350-025" on page 1-56.
   - If no, go to "Step 0350-022."

Step 0350-022: 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/Switch Supervisor Self-Test."
   - Refer to "Node supervisor self-test" on page 3-10.
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 0350-024" on page 1-56.
   - If no, go to "Step 0350-023."

Step 0350-023: 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/Switch Supervisor Self-Test."
   - Refer to "Node supervisor self-test" on page 3-10.
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 "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no, go to "Step 0350-024" on page 1-56.

Step 0350-024: You replaced the LED display card. However, LEDs of the same color on both the front of the node and on the node supervisor card still **do not** light at any time.

1. Replace the node supervisor card.
2. Perform "Node/Switch Supervisor Self-Test" to verify replacement.
   - Refer to “Node supervisor self-test” on page 3-10.
3. Go to “Step 0350-025.”

Step 0350-025: 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 "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

POWER3 SMP Thin and Wide Node minimum configuration (MAP 0360)

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 FRUs are exchanged one at a time until the failing one is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

Attention: The node must be placed into Service Position prior to handling logic/power parts. The node must be removed from Service Position prior to attempting to answer "Does the node IPL?". For removal and replacement of logic/power parts, refer to Chapter 4, “FRU removals and replacements” on page 4-1.

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 file system is fully or partially on the disconnected DASD. In this case, the node will only boot to a code in the range **517-518** or **551-557**; 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.

Step 0360-001: Physically identify the POWER3 SMP node type:

- If you have a POWER3 SMP Thin Node, go to “Step 0360-008” on page 1-58.
- If you have a POWER3 SMP Wide Node, go to “Step 0360-002.”

  Note: Wide nodes are composed of an I/O Expansion assembly attached to a thin node processor unit. The I/O Expansion assembly (left side) **does not** contain a supervisor card.

Step 0360-002: To determine which POWER3 SMP Wide Node assembly is failing, split the CPU assembly from the I/O Expansion assembly and IPL the "thin node" section.

1. Disconnect all 4-drop SCSI cable connectors from the I/O Expansion assembly DASD.
2. Remove all adapter cards from the CPU assembly.
3. Remove the nuts securing the CPU assembly adapter card guide and remove the guide.

4. Disconnect the I/O Expansion control cable from J2 on the CPU assembly I/O planar.
5. Remove the screws securing the CPU assembly chassis to the I/O Expansion assembly chassis, then separate the two chassis.
6. Reinstall the CPU assembly adapter card guide.
7. Reinstall all CPU assembly adapter cards.
8. Does the thin node section (CPU assembly) IPL properly?
   - If yes, go to "Step 0360-003."
   - If no:
     a. The problem is in the thin node section.
     b. Go to "Step 0360-008" on page 1-58.

Step 0360-003: You were able to IPL the thin node section of a POWER3 SMP Wide Node. This indicates that the failure is likely in the I/O Expansion assembly. Use this procedure to reassemble the POWER3 SMP Wide Node, place the I/O Expansion assembly into its minimum configuration, and continue diagnosing the problem.

1. Remove all adapters from the CPU and I/O Expansion assemblies.
2. Remove the nuts securing the CPU assembly adapter card guide and remove the guide.
3. Reinstall the I/O Expansion assembly to the CPU assembly.
4. Route the I/O Expansion assembly control cable through the chassis-wall cut-outs and reconnect the cable to J2 on the CPU assembly I/O planar.
5. Reinstall the CPU assembly adapter card guide.
6. Reinstall all CPU assembly adapter cards.
7. Reconnect all 4-drop SCSI cable connectors to their respective I/O Expansion assembly DASD.
8. Does the node IPL properly?
   - If yes, go to "Step 0360-004."
   - If no:
     a. The problem is likely in the minimum configured I/O Expansion assembly.
     b. Go to "Step 0360-016" on page 1-61.

Step 0360-004: With the I/O Expansion assembly in its minimum configuration, you were able to IPL the reassembled POWER3 SMP Wide Node.

1. One at a time, reinstall and test all the I/O Expansion assembly adapter cards that you previously removed in "Step 0360-003."
2. Does the node IPL properly?
   - If yes, go to "Step 0360-007" on page 1-58.
   - If no, go to "Step 0360-005" on page 1-58.

Step 0360-005: You reinstalled an adapter card into the I/O Expansion assembly of a POWER3 SMP Wide Node but you **were not** able to IPL the node. This indicates that the card you just **reinstalled** has failed.

1. **Replace** the failing card.
2. Does the node IPL properly?
   - If yes:
     a. Return to "Step 0360-004" on page 1-57 and reinstall the next adapter card.
     b. If all cards have been reinstalled, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no:
     a. The replacement card you installed has also failed and may indicate a problem with the I/O Expansion planar.
     b. Go to "Step 0360-006."

Step 0360-006: The POWER3 SMP Wide Node failed to IPL properly after both the reinstalled adapter card ("Step 0360-004" on page 1-57) and its replacement adapter card ("Step 0360-005") were installed in the I/O Expansion assembly.

- **Replace** the I/O Expansion assembly planar.
- Does the node IPL properly?
  – If yes, go to "Step 0360-004" on page 1-57.
  – If no, call the next level of support.

Step 0360-007: You reinstalled an adapter card into the I/O Expansion assembly of a POWER3 SMP Wide Node and you **were able** to IPL the node. This indicates that the reinstalled card is okay.

- Return to "Step 0360-004" on page 1-57 and reinstall the next card.
- If all adapter cards have been reinstalled, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.

Step 0360-008: You have a failing POWER3 SMP Thin Node or a POWER3 SMP Wide Node that has a problem in the thin node section and you need to place the unit into its minimum configuration. Use this procedure to place the Thin Node or thin node section into minimum configuration and then continue diagnosing the problem.

1. Remove all memory cards from the system planar.
2. Populate **one** memory card with DIMMs in J1 and J2 **only** (refer to "POWER3 SMP Thin and Wide Node locations" on page 2-12), then install that memory card in either memory slot 1 or 2.
3. Ensure that a CPU card is installed in CPU slot 1.
4. If a CPU card is installed in CPU slot 2, remove it.
5. Remove all CPU assembly adapter cards.
6. Does the node IPL properly?
   - If yes, go to "Step 0360-010" on page 1-59.
   - If no, go to "Step 0360-009" on page 1-59.

Step 0360-009: You have placed a POWER3 SMP Thin Node or the thin node section of a POWER3 SMP Wide Node into minimum configuration but the node still **does not** IPL properly.

1. One at a time, **replace** the following components and IPL the node.
   - Memory DIMMs
   - Memory card
   - CPU card
   - Boot DASD
   - SCSI cable (2- or 4-drop)
   - I/O planar
   - System planar
   - Flat ribbon power cable
2. Does the node IPL properly?
   - If yes, go to “Step 0360-010.”
   - If no:
     a. Replace the next component listed in this step.
     b. If you have replaced all listed components, call next level of support.

Step 0360-010: You were able to properly IPL a POWER3 SMP Thin Node or the thin node section of a POWER3 SMP Wide Node after you placed it into minimum configuration. You must now reinstall and test the components you removed to place the node into minimum configuration.

1. One at a time, **reinstall** and test the components removed in “Step 0360-008” on page 1-58.
2. Does the node IPL properly?
   - If yes, go to “Step 0360-013” on page 1-60.
   - If no, go to “Step 0360-011.”

Step 0360-011: You reinstalled a component in a POWER3 SMP Thin Node or the thin node section of a POWER3 SMP Wide Node but you **were not** able to IPL the node. This indicates that the component you just **reinstalled** has failed.

1. **Replace** the failing component.
2. Does the node IPL properly?
   - If yes:
     a. Return to “Step 0360-010” and reinstall the next component.
     b. If all components have been reinstalled, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no:
     a. The replacement component you installed failed and may indicate a problem with the component's planar.
     b. Go to “Step 0360-012” on page 1-60.

Step 0360-012: You arrived at this step from "Step 0360-011" because a POWER3 SMP Thin Node or the thin node section of a POWER3 SMP Wide Node failed to IPL after installation of a replacement component.

1. **Replace** the (system or I/O) planar to which the failing replacement component was installed.
2. Does the node IPL properly?
   - If yes, go to "Step 0360-013" on page 1-60.
   - If no, call the next level of support.

Step 0360-013: You reinstalled a component in a POWER3 SMP Thin Node or the thin node section of a POWER3 SMP Wide Node and you **were able** to IPL the node. This indicates that the reinstalled component is okay.

1. Return to "Step 0360-010" on page 1-59 and reinstall the next component.
2. If all components have been replaced, and this is a POWER3 SMP Thin Node, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
3. If all components have been replaced, and this is a thin node section from a POWER3 SMP Wide Node, go to "Step 0360-014."

Step 0360-014: You arrived here from "Step 0360-013" because the repaired thin node section of the POWER3 SMP Wide Node can now IPL and the I/O Expansion section (separated in "Step 0360-002" on page 1-56) must now be reattached and tested.

1. Remove all adapter cards from the CPU assembly.
2. Remove the nuts securing the CPU assembly adapter card guide, and remove the guide.
3. Reinstall the I/O Expansion assembly to the CPU assembly.
4. Route the I/O Expansion control cable through the chassis-wall cut-outs and reconnect the cable to J2 on the CPU I/O planar.
5. Reinstall the CPU assembly adapter card guide.
6. Reinstall all CPU assembly adapter cards.
7. Reconnect all 4-drop SCSI cable connectors to their respective I/O Expansion assembly DASDs.
8. Does the node IPL properly?
   - If yes, go to "End of call MAP (MAP 0650)" in *RS/6000 SP: System Service Guide*.
   - If no, go to "Step 0360-015."

Step 0360-015: The reassembled POWER3 SMP Wide Node does not IPL properly. Use this procedure to place the I/O Expansion assembly into its minimum configuration and continue testing.

1. Remove all adapter cards from the I/O Expansion assembly.
2. Does the node IPL properly?
   - If yes, go to "Step 0360-004" on page 1-57.
   - If no:
     a. The problem is likely in the minimum configured I/O Expansion assembly.
     b. Go to "Step 0360-016" on page 1-61.

Step 0360-016: You have determined that the minimum configured I/O Expansion assembly of a POWER3 SMP Wide Node is likely failing.

1. **Replace** the I/O Expansion control cable.
2. Does the node IPL properly?
   - If yes, go to "Step 0360-004" on page 1-57.
   - If no, go to "Step 0360-017."

Step 0360-017: You have replaced the I/O Expansion control cable and **were not** able to IPL the minimum configured POWER3 SMP Wide Node.

1. **Replace** the I/O Expansion planar.
2. Does the node IPL properly?
   - If yes, return to "Step 0360-004" on page 1-57.
   - If no, go to "Step 0360-018."

Step 0360-018: You replaced the I/O Expansion assembly planar but you **were not** able to IPL the reassembled POWER3 SMP Wide Node.

1. **Replace** the I/O Expansion assembly interposer adapter **cable**.
2. Does the node IPL properly?
   - If yes, go to "Step 0360-004" on page 1-57.
   - If no, go to "Step 0360-019."

Step 0360-019: You replaced the I/O Expansion assembly interposer adapter **cable** but you **were not** able to IPL the reassembled POWER3 SMP Wide Node.

1. **Replace** the I/O Expansion assembly interposer adapter **card**.
2. Does the node IPL properly?
   - If yes, go to "Step 0360-004" on page 1-57.
   - If no, go to "Step 0360-020."

Step 0360-020: You replaced the I/O Expansion assembly interposer adapter **card** but you **were not** able to IPL the reassembled POWER3 SMP Wide Node.

1. **Replace** the I/O Expansion assembly power assembly.
2. Does the node IPL properly?
   - If yes, go to "Step 0360-004" on page 1-57.
   - If no, call the next level of support.

Chapter 2. Locations

This section provides location information for the RS/6000 SP frames and the following nodes:

- 332 MHz Thin and Wide Node
- 200 MHz POWER3 SMP Thin and Wide Node
- 375 MHz POWER3 SMP Thin and Wide Node

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)

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
```

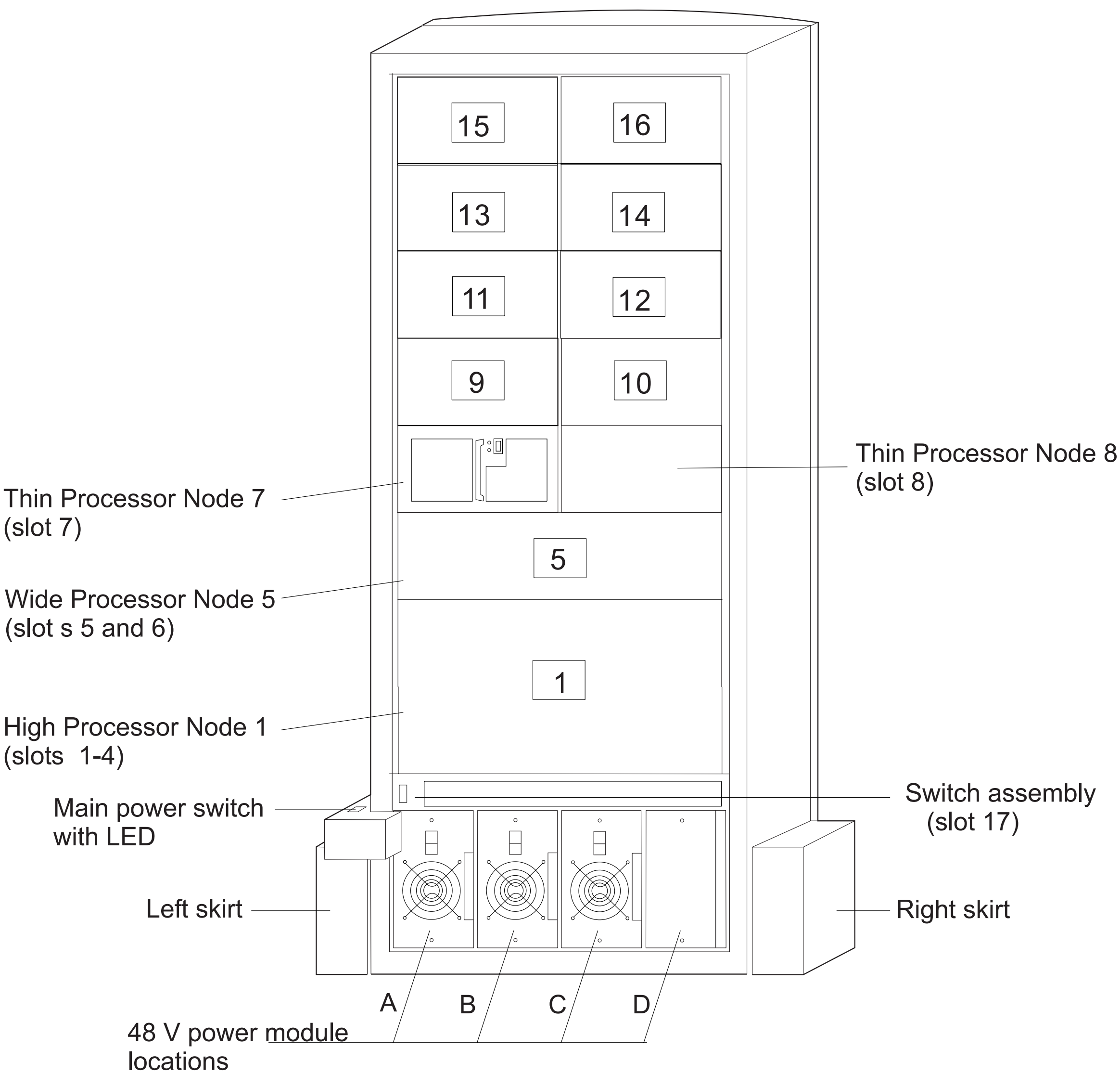
Location diagrams of the RS/6000 SP components

See Figure 2-1, 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.

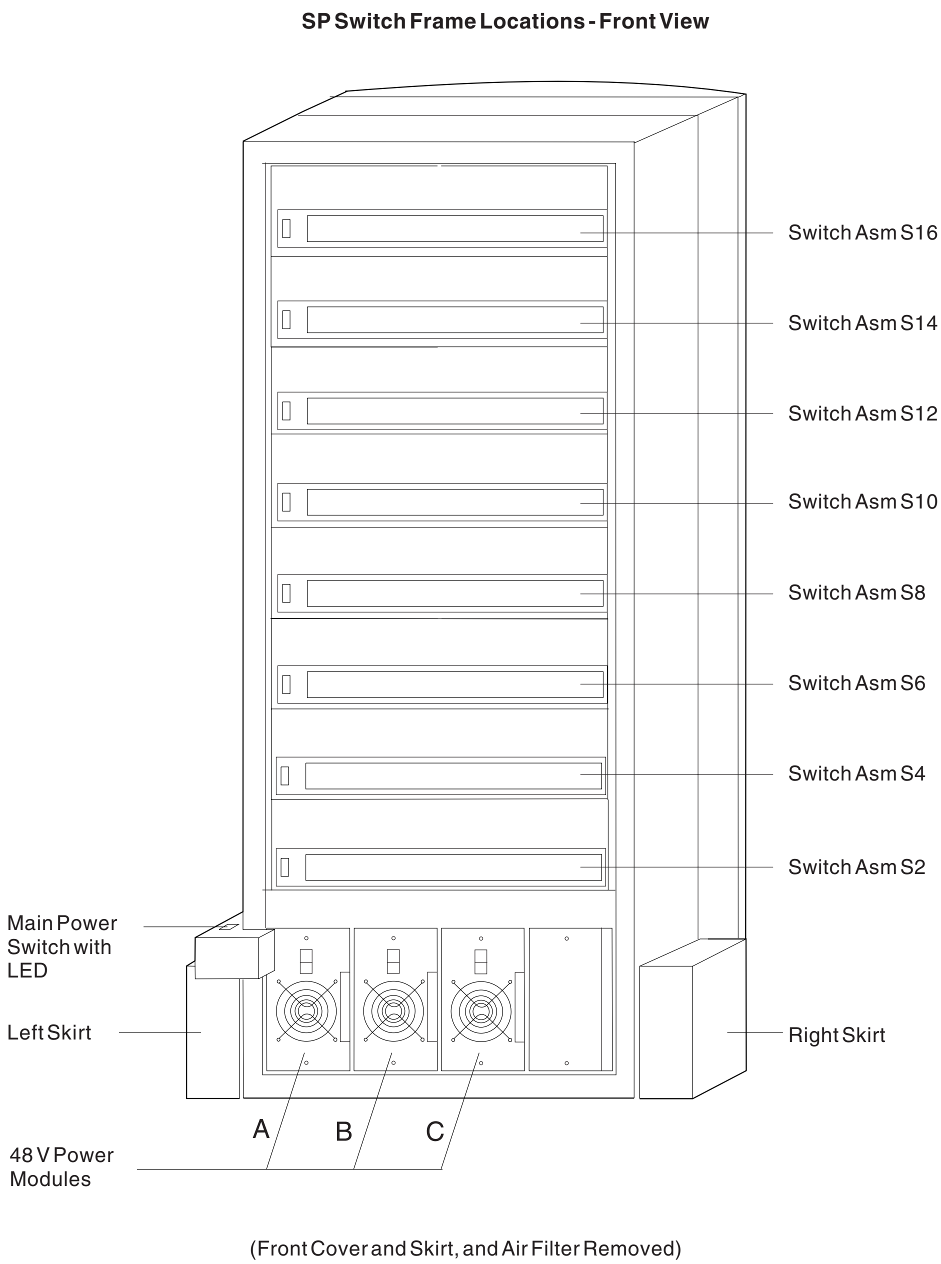


Figure 2-2. Front view of multi-switch frame locations

Figure 2-3 on page 2-5 shows a front view of the Model 3AX (49-inch) frame.

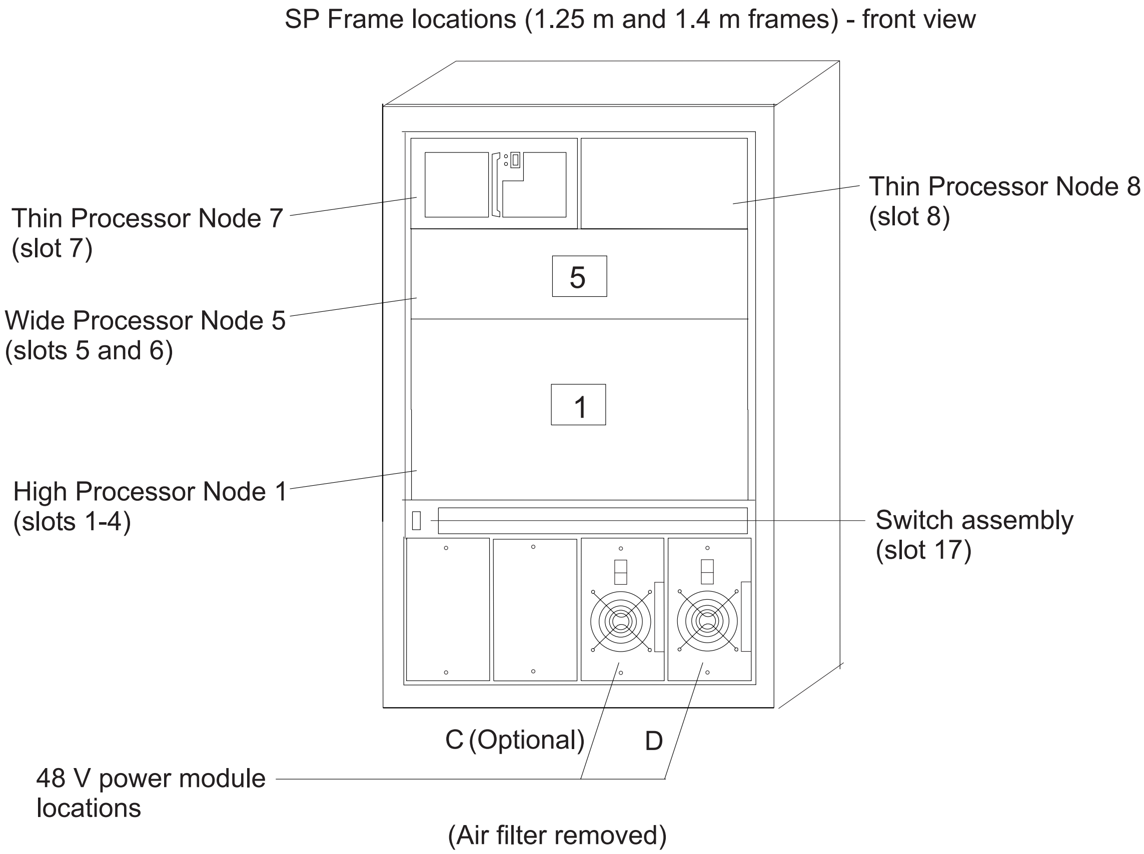


Figure 2-3. Front view of 49-inch frame locations. See notes below.

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 49-inch 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 1.4 m frame.

Figure 2-4 on page 2-6 shows a rear view of the RS/6000 SP frame locations.

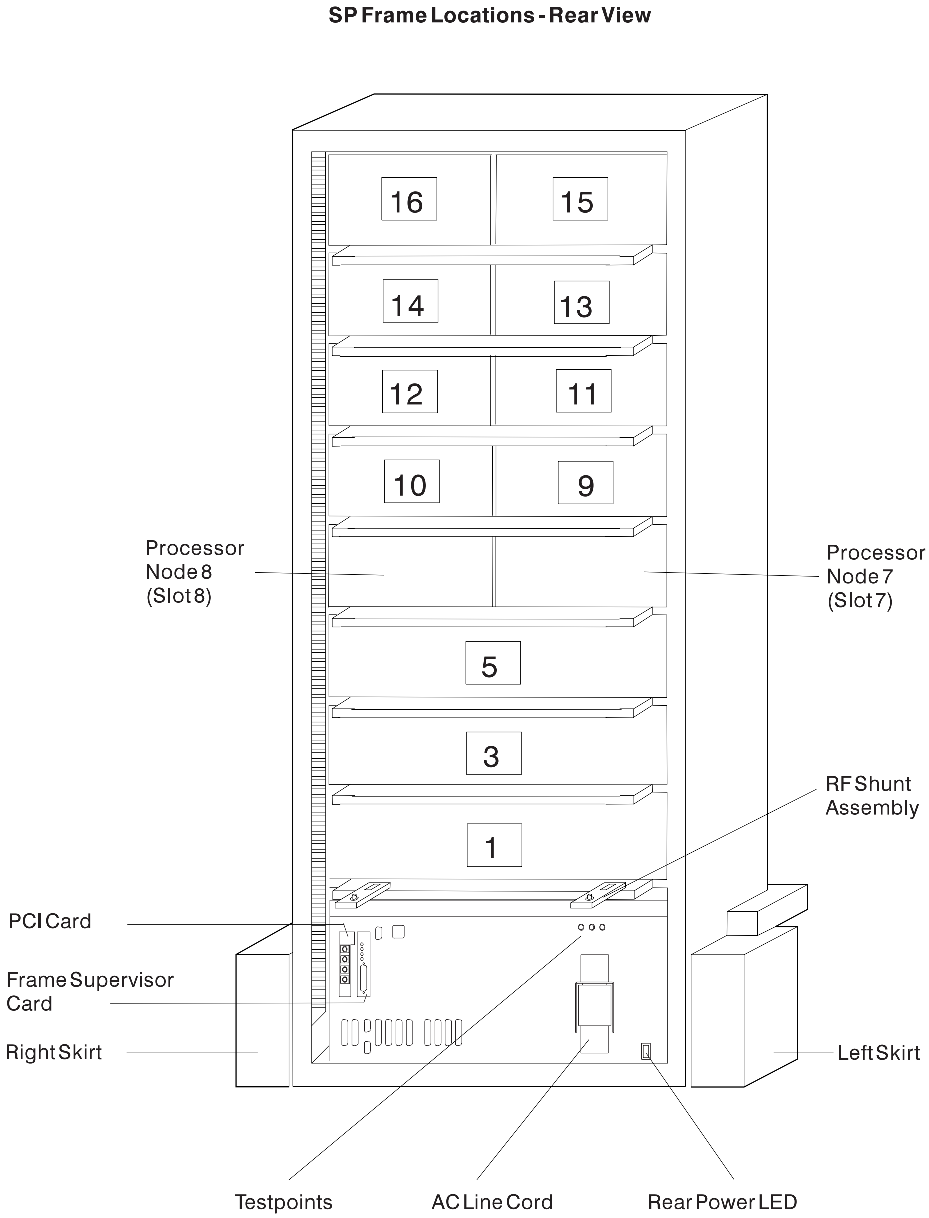


Figure 2-4. Rear view of frame locations

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`

332 MHz SMP Thin and Wide Node locations

Figure 2-5 shows a high level component diagram of a RS/6000 SP 332 MHz SMP processor node and Figure 2-6 on page 2-8 shows a top view.

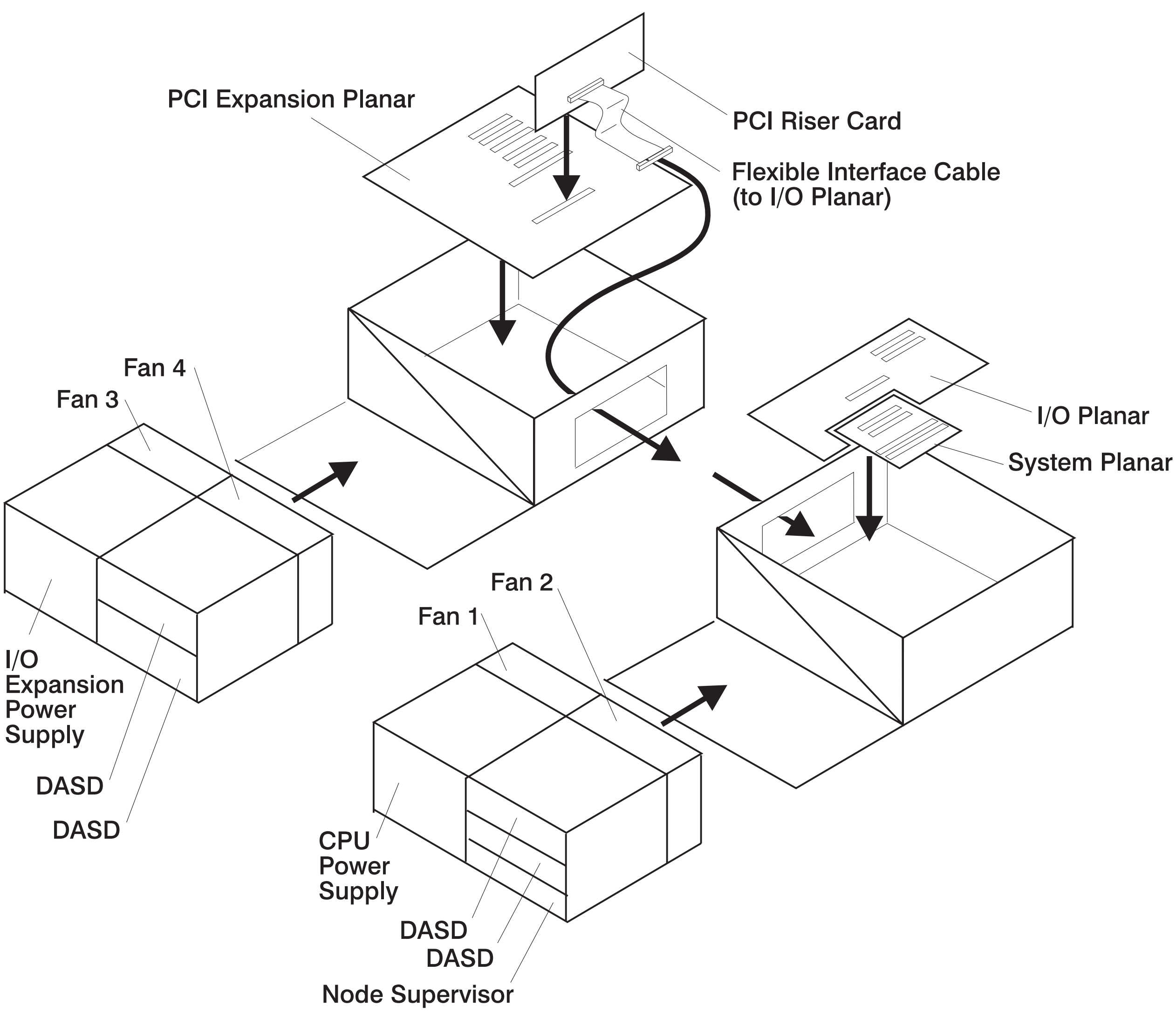


Figure 2-5. 332 MHz SMP Node high level component diagram

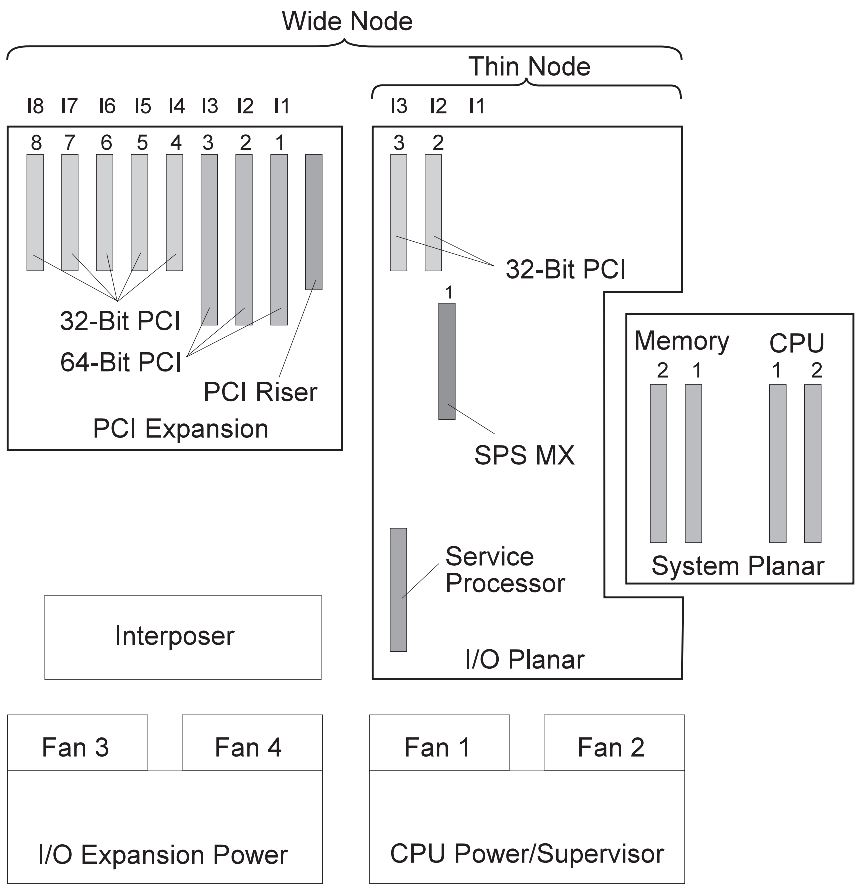


Figure 2-6. Top view of 332 MHz SMP Node

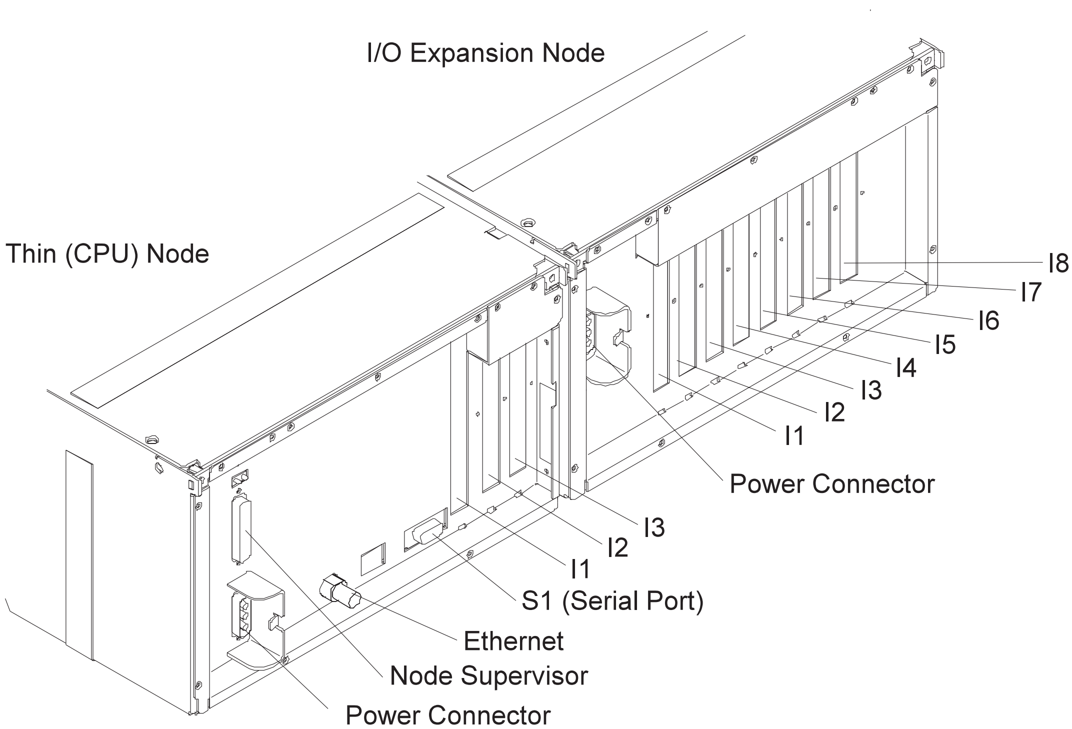


Figure 2-7. 332 MHz SMP Node rear view

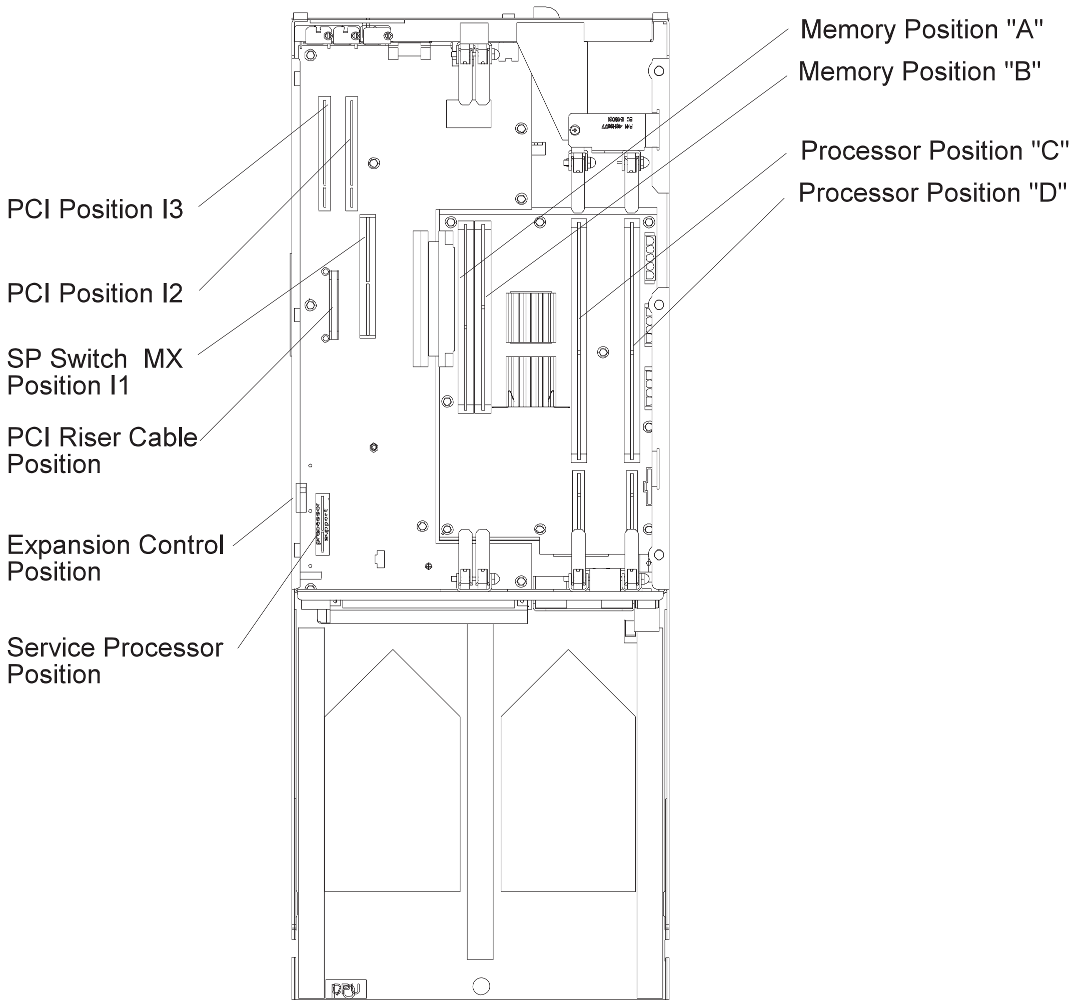


Figure 2-8. Top view of 332 MHz SMP Thin Processor Node

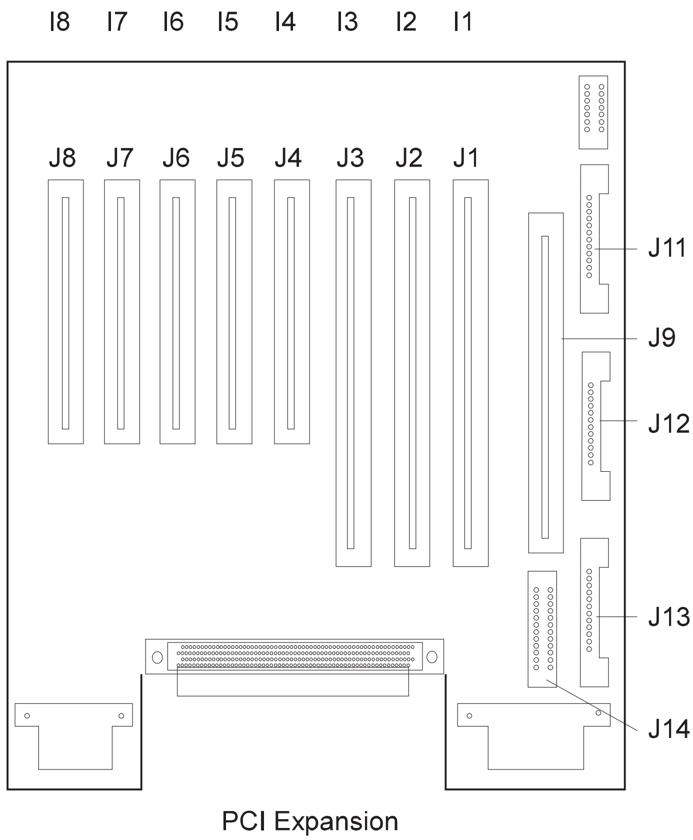


Figure 2-9. 332 MHz SMP Node I/O expansion planar

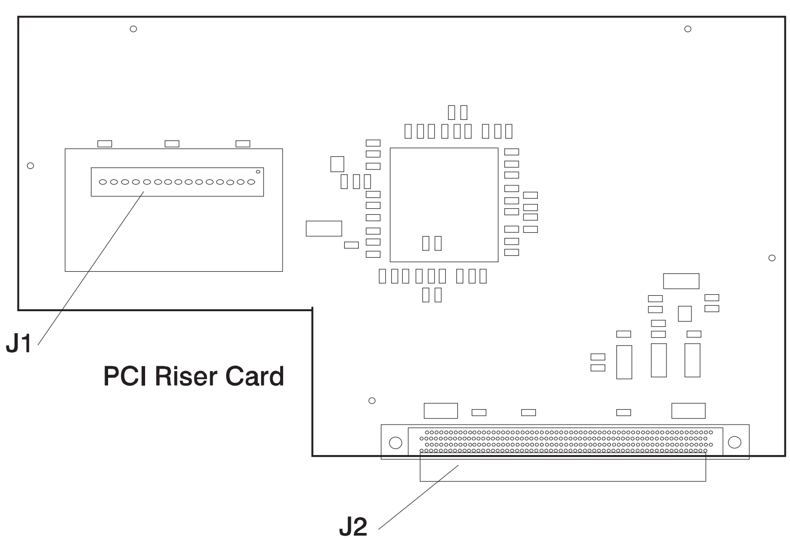


Figure 2-10. 332 MHz SMP Node riser card

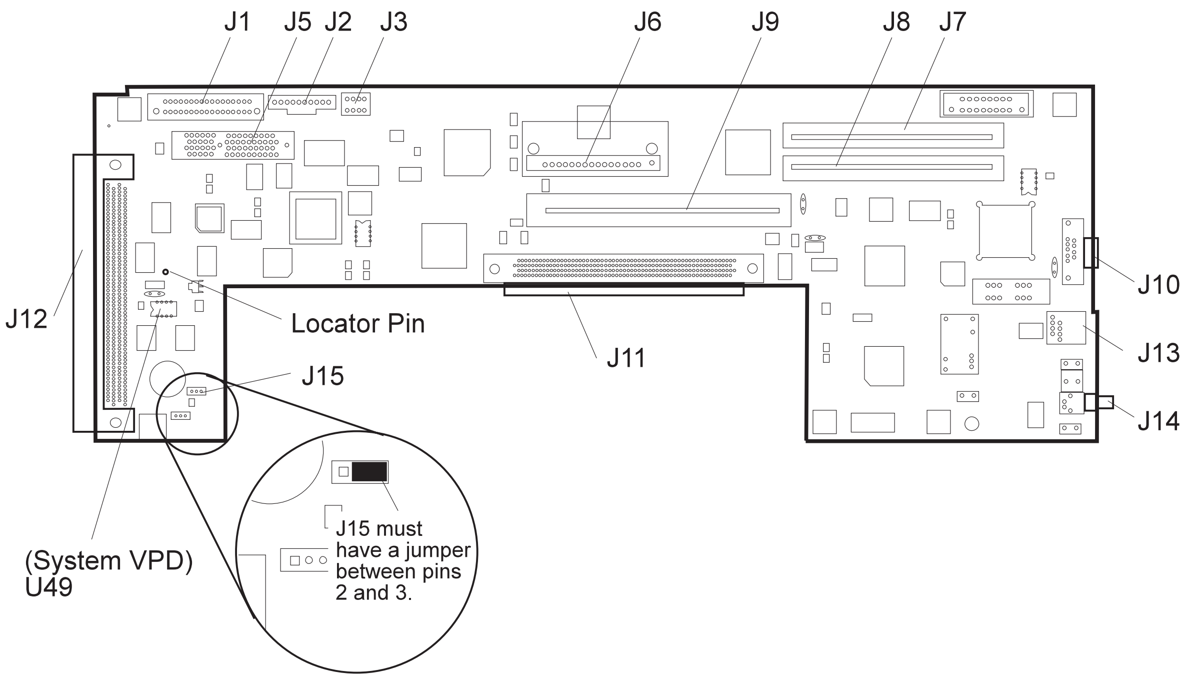


Figure 2-11. 332 MHz SMP Node I/O planar

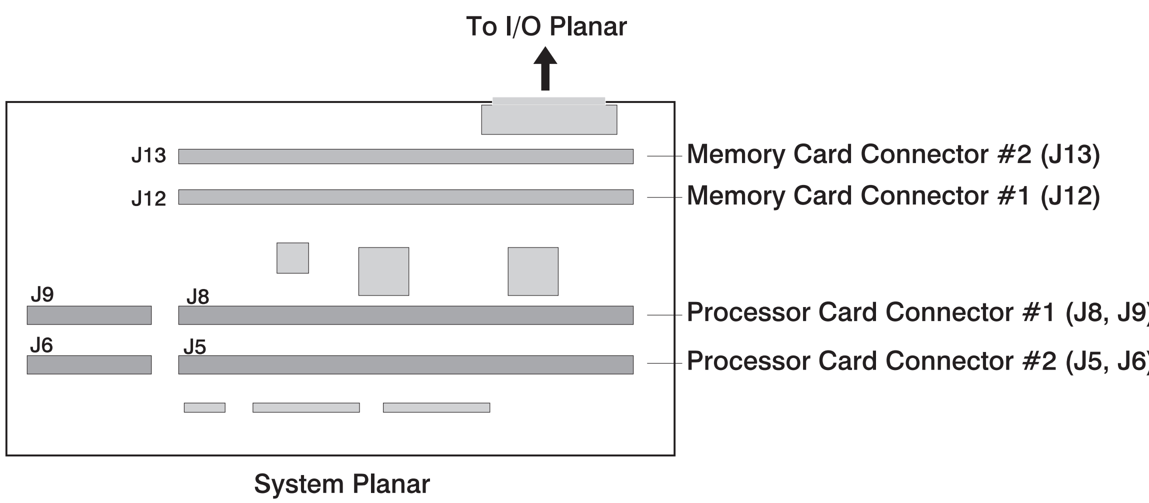


Figure 2-12. 332 MHz SMP Node system planar

J5, J6	Processor card connector #2 (Processor - Slot 2)
J8, J9	Processor card connector #1 (Processor - Slot 1, Base Card)
J12	Memory card connector #1 (Memory - Slot 1)
J13	Memory card connector #2 (Memory - Slot 2)

Note: To IPL successfully, a processor card must be installed in processor slot 1.

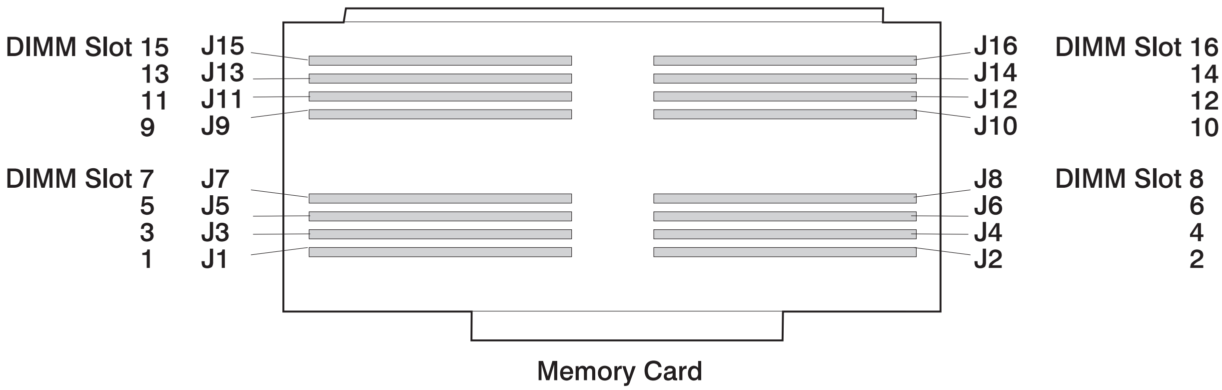


Figure 2-13. 332 MHz SMP Node Memory card - DIMM locations

POWER3 SMP Thin and Wide Node locations

This section shows location information for 200 MHz and 375 MHz POWER3 SMP Thin and Wide Nodes.

Figure 2-14 shows a high level component diagram of a RS/6000 SP POWER3 SMP Wide Node and Figure 2-15 on page 2-13 shows a top view.

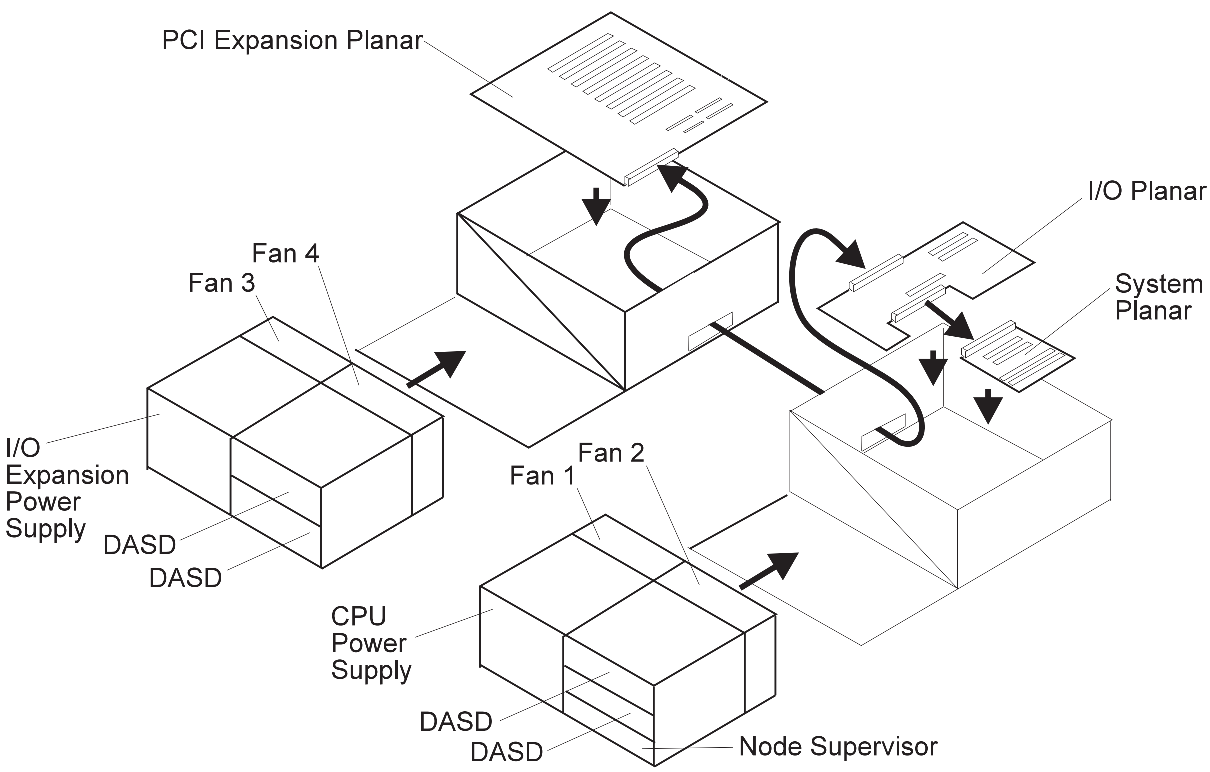


Figure 2-14. POWER3 SMP Wide Node high level component diagram

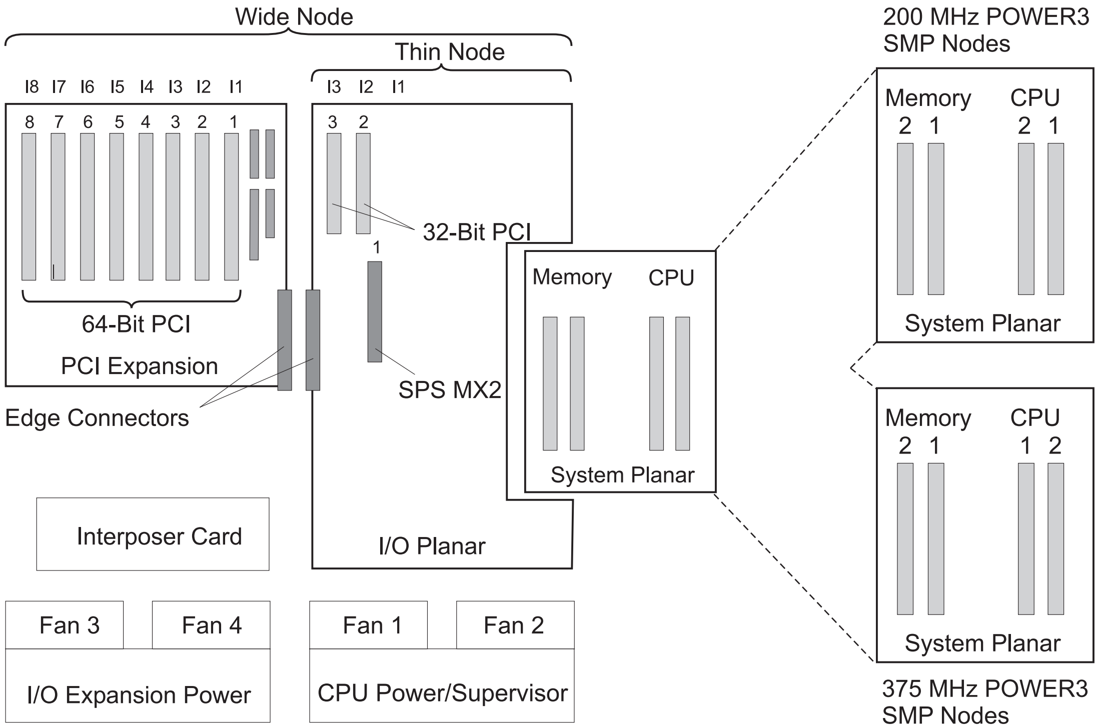


Figure 2-15. Top view of POWER3 SMP Wide Node

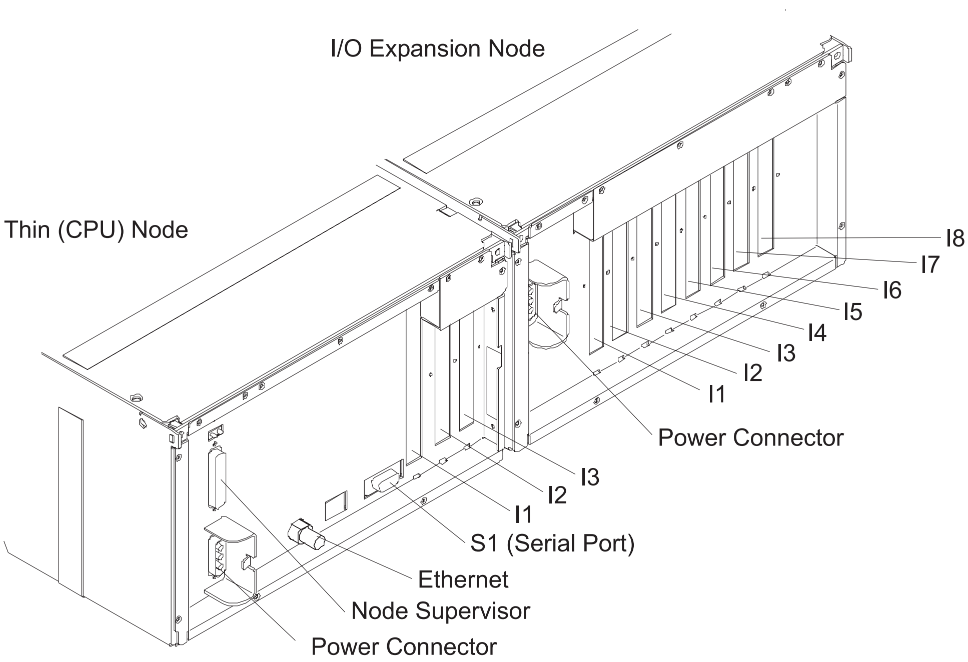


Figure 2-16. POWER3 SMP Wide Node rear view

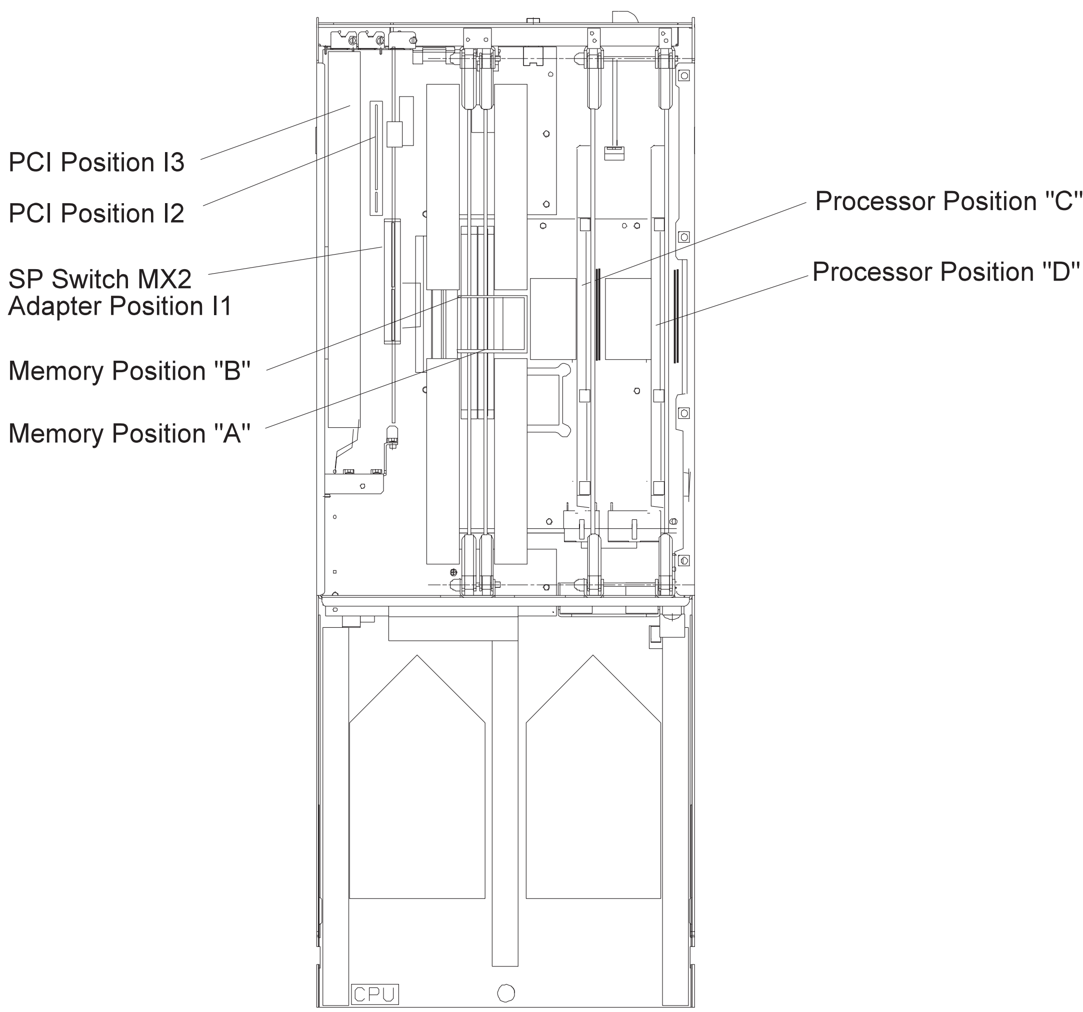


Figure 2-17. Top view of POWER3 SMP Thin Node

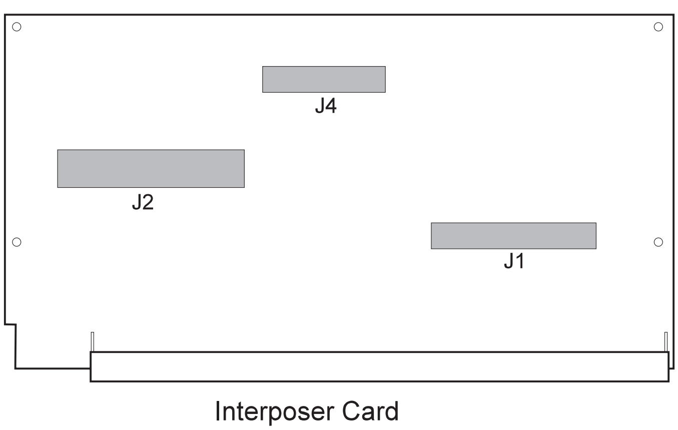


Figure 2-18. POWER3 SMP Wide Node interposer card

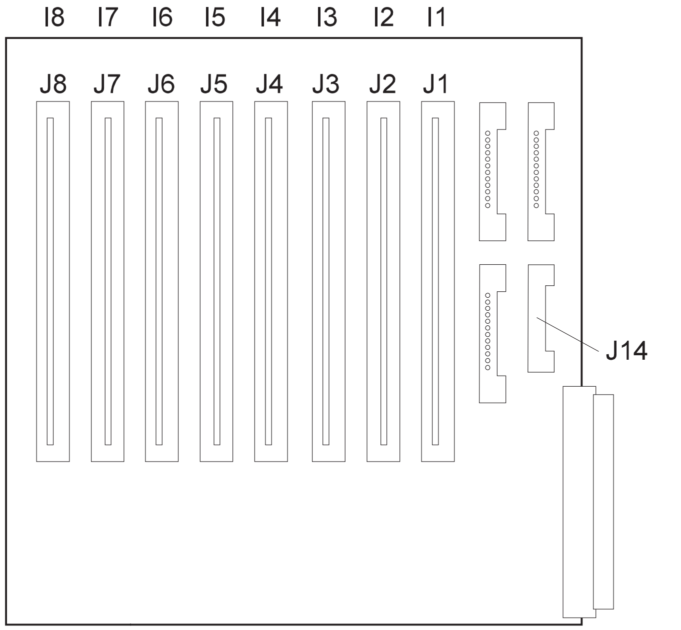


Figure 2-19. POWER3 SMP Wide Node I/O expansion planar

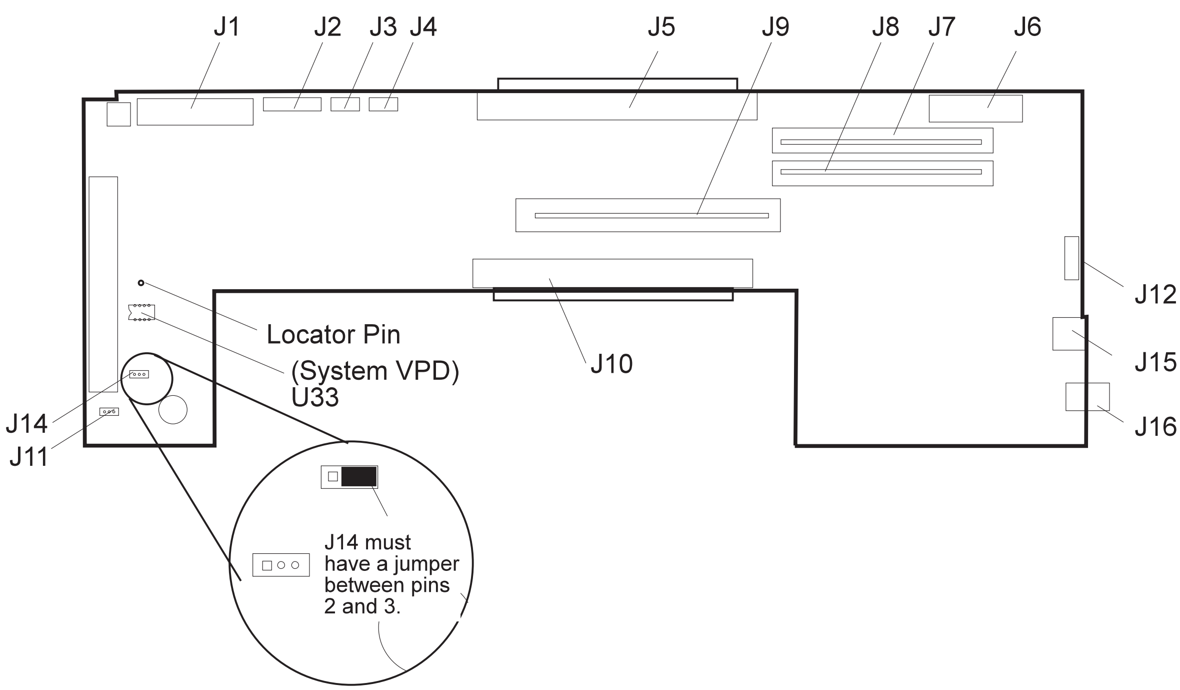


Figure 2-20. POWER3 SMP Thin Node I/O planar

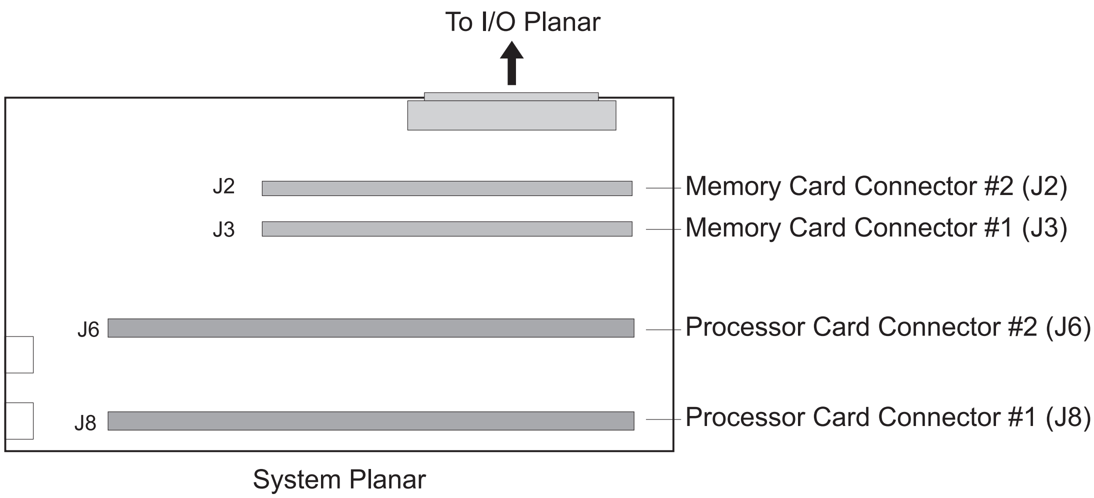


Figure 2-21. 200 MHz POWER3 SMP Node system planar

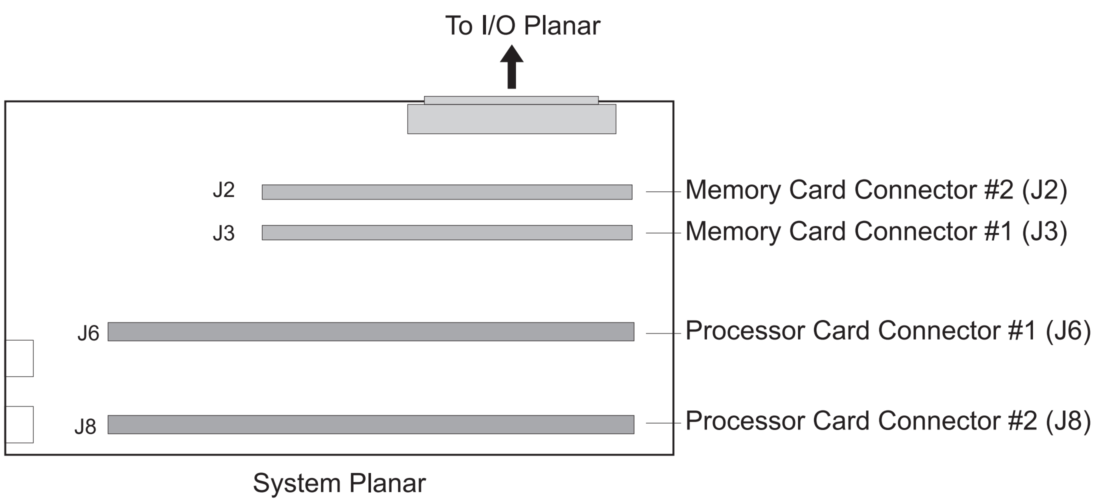


Figure 2-22. 375 MHz POWER3 SMP Thin Node system planar

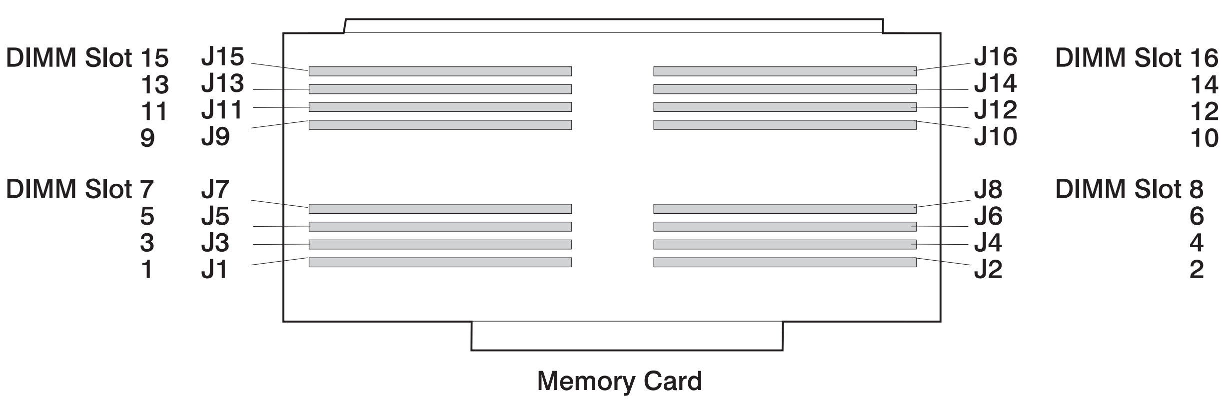


Figure 2-23. POWER3 SMP Thin Node memory card - DIMM locations

Connector details

Figure 2-24 on page 2-17 shows RS/6000 SP component connector details.

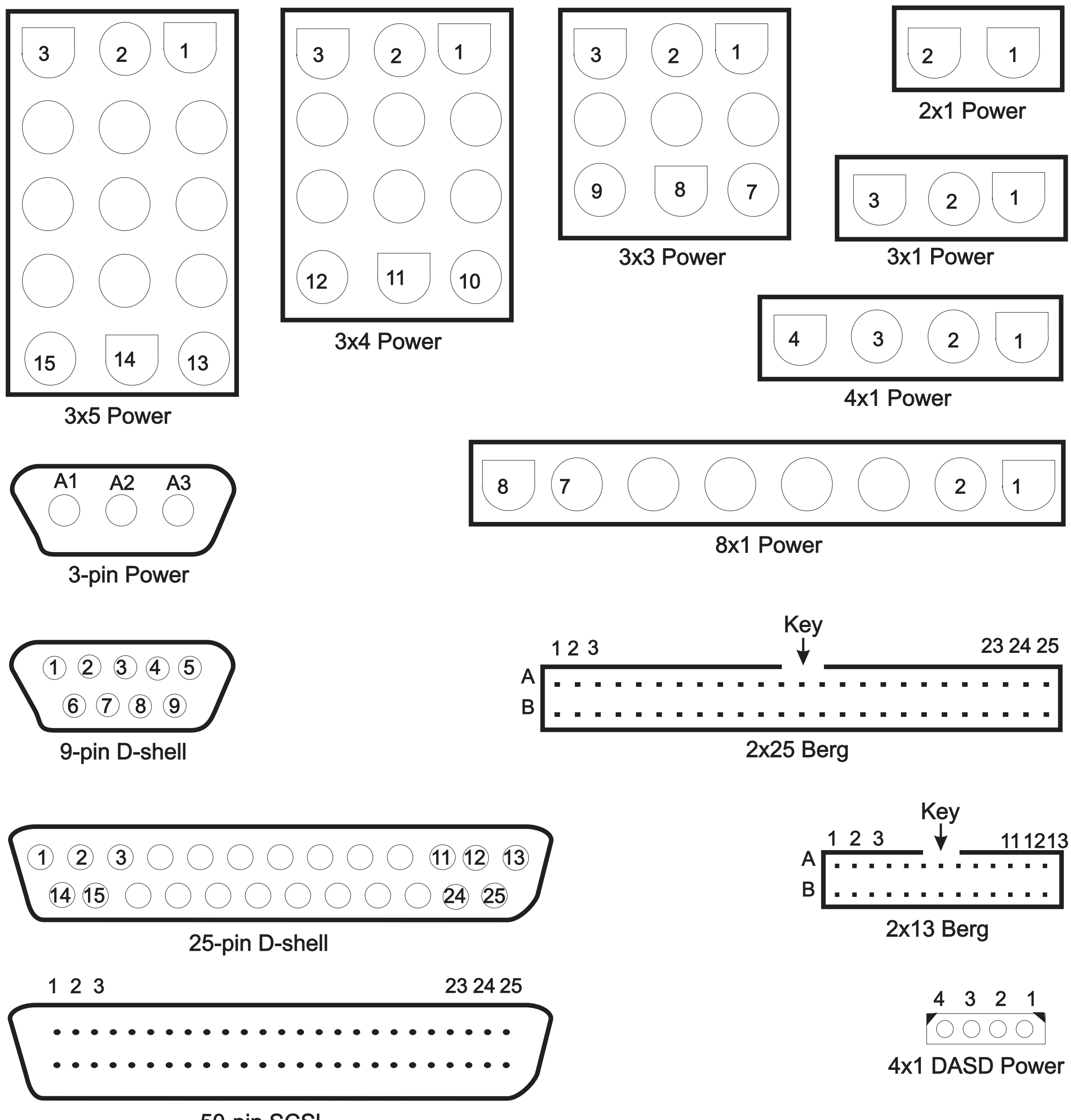


Figure 2-24. RS/6000 SP connector details (as seen at receiving ends, not at cable ends)

Cable routing

Figure 2-25 on page 2-18 and Figure 2-26 on page 2-18 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.

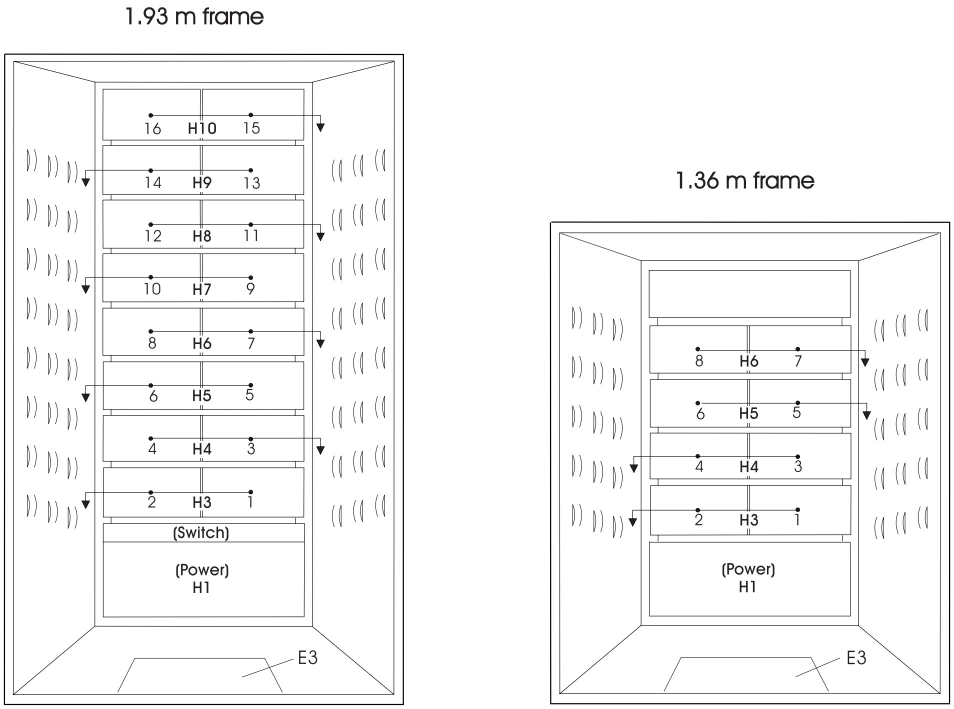


Figure 2-25. Frame cabling routing path in rear of RS/6000 SP frame — 1.93 m and 1.36 m frames

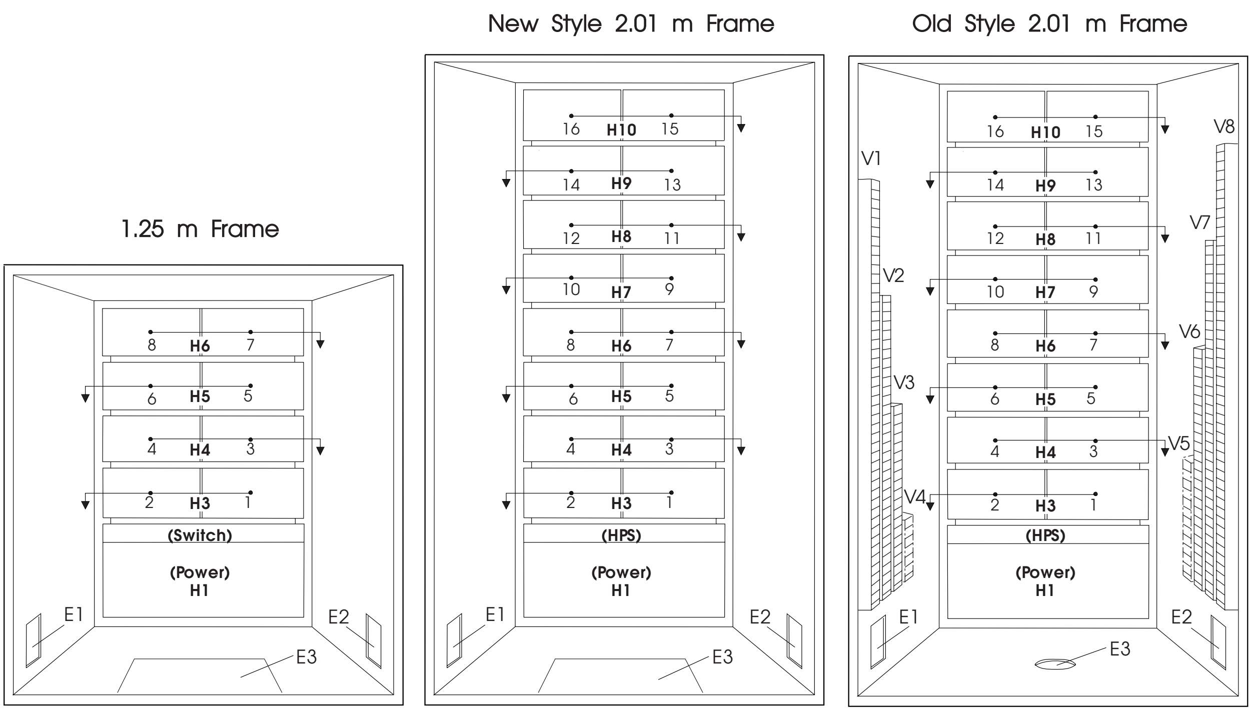


Figure 2-26. Frame cabling routing path in rear of RS/6000 SP frame — 1.25 and 2.01 m frames

Note: For a multi-switch frame (F/C 2030/1), refer to Figure 2-25.

Table 2-1 on page 2-19 shows external cable routing in a RS/6000 SP frame populated with 16 processor nodes. (Refer to “Cable routing” on page 2-17 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 2-1. External cable routing

Chapter 3. Service procedures

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.

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)” on page 3-3 or “Service mode (from network boot)” on page 3-3 to test the device.

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. Reboot the node (power the node off, wait briefly, then power the node on)
   b. Immediately after the words “memory” and “keyboard” are displayed, press and hold the **6** key (for a few seconds) on the TTY console
   c. Enter any requested passwords
   d. 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”.

Service 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. Some Micro Channel adapters are not supported.

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 3-4.

   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. A diagnostic menu appears when the processor node has completed IPL
6. When you have completed diagnostics, you can power off the processor node
7. 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" for more information.

   Note: The command should be:

   spbootins -r disk *frame# slot#* **1**

Selecting a processor node boot response

The following procedure describes how to select the boot response for a single processor node.

Note: The menus in this section and the output text shown are based on the "English" option selection on the System Management Services Language menu ("Select language" on page 3-31).

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:

Table 3-1. Selectable processor node boot responses	
response	**Description**
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. Click on the processor node (or nodes) you are going to boot from a network
3. Click on “Actions” button on the tool bar
4. Verify the nodes selected, then click on the "Apply" button
5. IPL from network device begins

   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. On the System Management Services Menu:
   a. Enter **2** to select Multiboot
   b. Enter **4** to select Boot Devices
   c. Enter **3** to select 1st Boot Device.

   Note: For menu display format and other information, see “Service processor menus” on page 3-32.

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.”

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), Chapter 1, “Maintenance Analysis Procedures (MAPs)” on page 1-1, 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.
---------------------------------------------------------------------------
```

Diagnosing a machine check

Machine checks occur for processor data bus parity errors (and uncorrectable ECC errors). Machine checks also occur for some internal 60x processor errors.

Determining validity

Most machine check entries are valid in the AIX error log. They are labeled

```
Machine_Check_smp
```

However, if the error label is not `Machine_Check_smp`, then it is not a valid machine check. (For example, NVRAM was drained and the resulting corrupted data looked like a non-SMP machine check.)

Determining type of machine check

Machine checks are recorded for Data Bus Parity Error, Uncorrectable ECC Errors, and certain internal processor errors.

To decode the type of error you need the value of the MACHINE STATUS SAVE/RESTORE REGISTER 1. The value is found under the Detail Data for the Machine Check. For example, the following register:

```
1002 9030
```

The left-most bit is **bit 31**. The right-most bit (least-most bit) is **bit 0**. Bits 21, 20, 17, and 16 represent the type of checkstop that occurred:

Bit 21 = 1 CPU internal data cache parity error

Bit 20 = 1 CPU internal instruction cache parity error

Bit 17 = 1 CPU data bus parity error

Bit 16 = 1 CPU address bus parity error

In the preceding example register (`1002 9030`), the 1002 is decoded as:

0001 0000 0000 0010

Bit 17
(bit = 1, Bus Data Parity Error)

Bit 19

Determining which CPU caused the machine check

Note: Retain HSF H163707 shows how to evaluate machine checks using surveillance timeout data collection for the 332 MHz SMP Thin and Wide Node.

A stanza in the Machine Check Error Log labeled:

```
Central Processing Unit Number
```

Under this stanza is the number of the CPU which caused the machine check (0—1 is on the first processor card, 1—2 is on the second processor card, and so on).

If this stanza is not present in the checkstop file, then find the CPU causing the machine check using Bits 30—27 of the MACHINE STATUS SAVE/RESTORE REGISTER 1 (which was previously used to determine the type of machine check). For example, if the register showed:

```
1002 A030
```

The first 16 bits (1002) represent:

0001 0000 0000 0010

Bit 27

Bit 30

Bits 30—27 are `0010`, which gives CPU2 (numbered from 0—15, where Card 0 has CPUs 0 and 1, Card 1 has CPUs 2 and 3, and so on).

Correcting a machine check

For any case other than the Data Bus Parity Error, replace the processor card containing the CPU that produced the error.

To determine the cause, look in the error log for entries that took place at the time of the machine check. Search for another entry, with a memory card as the resource type, which shows an unrecoverable memory error (and calls out a specific memory card and DIMM).

- If there is one, handle the problem as a memory error.

- If there is none, assume the problem is caused by the processor. Replace the processor card containing the CPU that caused the error.

Node supervisor self-test

The following procedures will help you perform self-test on the node or switch supervisor cards. Upon completion of this test, return to the procedure that sent you here.

If this is a 332 MHz SMP or POWER3 SMP Thin or Wide Node:

1. Disconnect the node supervisor cable from the rear of the node.
2. Locate LED 5. See Figure 3-1.

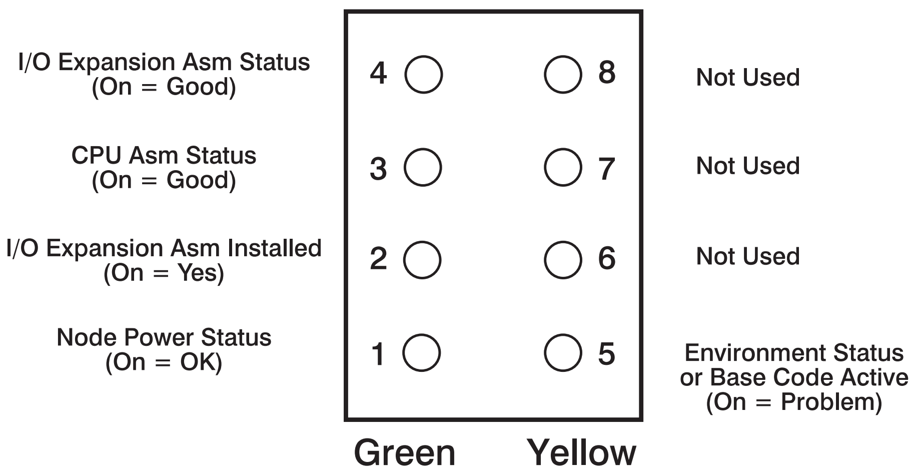


Figure 3-1. 332 MHz SMP and POWER3 SMP Thin and Wide Node LEDs

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" pull down, 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" pull down, 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" pull down, 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 3-14 before returning to the procedure that directed you here.

Service position procedures

Note: When preparing to place processor node(s) and/or switch assembly(s) into service position, ensure that the customer has removed the processor node(s) and/or switch assembly(s) from the active configuration.

Placing a 332 MHz SMP or POWER3 SMP Thin and Wide Node into service position

1. Ensure the node has been shutdown and powered off before continuing.
2. Set the power assembly circuit breaker(s) in the Off (‘0’) position.
3. Set the 48-volt distribution cable inline circuit breaker(s) in the Off (‘0’) position.
4. Remove the 48-volt distribution cable(s) from the rear of the processor node.
5. Remove the supervisor cable from the rear of the processor node.
6. Record the location and remove all other cables from the rear of the processor node.
7. Remove the node front cover panel by loosening the 4 screws.
8. If necessary, unplug the 4-drop DASD cable from the I/O expansion assembly.

9. Remove the retaining screw at the front of the power assembly(s) and retain for later use.
10. Pull the power interlock bar(s) forward and down to unlatch and remove the power assembly(s).
11. Remove the retaining screws at the rear of the node and retain for later use.
12. Remove the logic portion of the node assembly by sliding it out the front of the frame.
13. Place the assembly on an electrostatic-safe mat to continue service.

Replacing a 332 MHz SMP or POWER3 SMP Thin and Wide Node from service position

1. Install the logic portion of the node assembly by sliding it in the front of the frame.
2. Secure the rear of the node using the retaining screws previously removed from the rear of the node.
3. Install and latch the power assembly(s) by lifting and pushing froward on the power interlock bar(s). Ensure the power interlock tab(s) is engaged by pushing in on the tab(s)
4. Secure the front of the power assembly(s) using the retaining screws previously removed from the power assembly(s).
5. If necessary, plug the 4-drop DASD cable in the I/O expansion assembly.
6. Install the node front cover panel and tighten the 4 screws.
7. Install the supervisor cable in the rear of the processor node.
8. Install the 48-volt distribution cable(s) in the rear of the processor node.
9. Install all other cables that were removed from the rear of the processor node.
10. Set the 48-volt distribution cable inline circuit breaker(s) in the On (‘1’) position.
11. Set the power assembly(s) circuit breaker(s) in the On (‘1’) position.

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. Click on the processor node (or nodes) you are going to boot from a network
   c. Click on “Actions” button on the tool bar
   d. Verify the nodes selected, then click on the "Apply" button
   e. IPL from network device begins

   Note: If Packets Received always shows “00000”, there is a network or configuration problem.
5. When this 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

System and service processor firmware updates are available in the CORE database on Lotus Notes. Refer to the section "9076 - Microcode Node". If necessary, contact your local Lotus support to obtain access to the database. The firmware updates resident in the CORE database contain firmware installation instructions appropriate for the node.

Installing adapter microcode packages

Certain adapters are shipped with an adapter firmware diskette. For factory configured systems, the microcode 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.

Draining the NVRAM

Use one of the following procedures to drain the NVRAM, depending on the node type.

- Physically drain the NVRAM on 332 MHz SMP or 200 and 375 MHz POWER3 SMP Thin and Wide Nodes
- Logically drain the NVRAM on 200 and 375 MHz POWER3 SMP Thin and Wide Nodes.

Physically draining the NVRAM

Use the following procedure to physically drain the NVRAM on 332 MHz SMP or 200 and 375 MHz POWER3 SMP Nodes (for example, when an E1DC firmware checkpoint occurs).

1. Refer to “Removing the CPU and I/O expansion power assemblies” on page 4-28 to power down the node and remove the CPU assembly.
2. Locate the applicable jumper:

   332 MHz SMP Nodes J15 (see Figure 2-11 on page 2-11)

   200 and 375 MHz POWER3 SMP Nodes J14 (see Figure 2-20 on page 2-15)
3. Move the jumper from position 2/3 to position 1/2.
4. Wait several minutes, then return the jumper to position 2/3.
5. Refer to “Replacing the CPU and I/O expansion power assemblies” on page 4-28 to replace the CPU assembly and power up the node.

Logically draining the NVRAM

Use the following procedure to logically drain the NVRAM on POWER3 SMP Thin and Wide Nodes (for example, when an E1DC firmware checkpoint occurs).

1. On the System Management Services menu, go to the OK prompt (option 8 on the Main Menu).
2. Type:

   `dev /nvram, wipe-nvram`
3. When you receive an "ok" response, either:
   - Physically power-off the node:
     a. Set the 48-volt distribution cable inline circuit breaker(s) in the Off (‘0’) position to power-off the node.
     b. Wait 30 seconds.
     c. Set the 48-volt distribution cable inline circuit breaker(s) in the On (‘1’) position to power-on the node.
   - Or, logically power-off the node:

a. Logically power-off the node, then go to the Service Processor menus.

b. On the MAIN MENU, select option 1 "Service Processor Setup Menu".

c. On the SERVICE PROCESSOR SETUP MENU, select option 6 "Reset Service Processor"

d. The message "WARNING: SP RESET WILL EXIT MENUS!", is displayed. Enter **y** to continue.

e. Observe the LCD change from E075 to E021. The LCD remains at E021 for up to 1 minute and then changes to "OK".

f. Logically power-on 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 Chapter 4, “FRU removals and replacements” on page 4-1 for instructions on module removal and installation; 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 reinstall 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 on page 3-19.
   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 3-19, if the system does not stop at an E3xx code, skip to step 4 on page 3-19.
   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 on page 3-19.
   e. Remove the suspect bad tag, reinstall 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 3-19.

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 reinstall 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.
   g. Power down the system.
   h. If there are more memory module pairs to be reinstalled 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 reinstalled, 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 reinstalled 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. 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, reinstall 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 Tape and 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 node 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 node 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, 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.
3. If attempting to boot from a Hard disk:
   a. Verify proper SCSI bus termination.
   b. Replace 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, reattach 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, reinstall 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 SCSI drive.
   h. Replace I/O planar.
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 node.
   e. Have network administrator verify the node configuration for this client.
   f. Replace 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, reinstall 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).
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 the applicable node minimum configuration MAP in Chapter 1, “Maintenance Analysis Procedures (MAPs)” on page 1-1.

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 SPH99294
(c) Copyright IBM Corp. 1997  All rights reserved.
-------------------------------------------------------------------------------
System Management Services

1  Display Configuration
2  Multiboot
3  Utilities
4  Select Language









                                                                       .------.
                                                                       |X=Exit|
                                                                        ------'

===>
```

See the following for option descriptions:

- “Display configuration”
- “Multiboot” on page 3-22
- “Utilities” on page 3-25
- “Select language” on page 3-31

After you have finished using the text-based System Management Services, enter **x** (exit) to boot your system.

Display configuration

This option (option 1 on the System Management Services menu) provides information about the setup of your computer. A screen similar to the following is displayed.

```
Device Name

PowerPC,POWER3 200 MHz
L2-Cache 4096K
Memory
   Memory Card Slot 1, module slot=1 size = 128 MB
   Memory Card Slot 1, module slot=2 size = 128 MB
   Memory Card Slot 1, module slot=5 size = 128 MB
   Memory Card Slot 1, module slot=6 size = 128 MB
   Memory Card Slot 1, module slot=7 size = 128 MB
   Memory Card Slot 1, module slot=8 size = 128 MB
Service Processor
COM
   addr=3f8
COM
   addr=2f8
Diskette Drive



               .-----------.                                       .------.
               |N=next-page|                                       |X=Exit|
                -----------'                                        ------'
```

Multiboot

The Multiboot Menu is option 2 on the System Management Services menu. A screen similar to the following is displayed.

```
RS/6000 Firmware
Version SPH99294
(c) Copyright IBM Corp. 1997  All rights reserved.
-------------------------------------------------------------------------------
Multiboot

1  Select Software
2  Software Default
3  Select Install Device
4  Select Boot Devices
5  OK Prompt
6  Multiboot Startup <OFF>






                                                                   .------.
                                                                   |X=Exit|
                                                                    ------'

===>
```

Figure 3-2. Multiboot menu, POWER3 SMP example

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 CDROM, 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.

```
RS/6000 Firmware
Version SPH99294
(c) Copyright IBM Corp. 1997  All rights reserved.
-------------------------------------------------------------------------------
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 Select Install Devices in the Multiboot menu and select Ethernet as a boot device.

```
RS/6000 Firmware
Version SPH99294
(c) Copyright IBM Corp. 1997  All rights reserved.
-------------------------------------------------------------------------------

Current Boot Sequence

1  SCSI 9100 MB Harddisk id=0 ( Integrated )
2    None
3    None
4    None
5    None

                                                                      .------.
                                                                      |X=Exit|
                                                                       ------'
```

Selecting any of the Configure Boot Device options displays a screen similar to the following:

```
Configure 1st Boot Device

Device Current Device
Number Position Name
1       1        Diskette
2       2        SCSI 9100 MB Harddisk id=0 ( Integrated )
3       3        Token-Ring  ( slot=2 )
4       -        Ethernet  ( slot=3 )
5       -        Ethernet  ( Integrated )
6       -        Ethernet  ( slot=2 )
7                None

                                                                      .------.
                                                                      |X=Exit|
                                                                       ------'

===>2
```

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 Startup: 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.

Utilities

The Utilities screen (option 3 on the System Management Services menu) enables you to select from the following system management tools. Depending on the node type, a screen similar to one of the following is displayed.

```
RS/6000 Firmware
Version SPH99294
(c) Copyright IBM Corp. 1997  All rights reserved.
-------------------------------------------------------------------------------
Utilities

1  Set Passwords and Unattended Start Mode
2  Test Memory
3  Display Error Log
4  Remote Initial Program Load Setup
5  Change SCSI Id
6  Update System Firmware
7  Update Service Processor Firmware
8  Select Console





                                                                       .------.
                                                                       |X=Exit|
                                                                        ------'

===>
```

Figure 3-3. 332 MHz SMP Node Utilities menu

```
RS/6000 Firmware
Version SPH99294
(c) Copyright IBM Corp. 1997  All rights reserved.
-------------------------------------------------------------------------------
Utilities

1  Set Passwords and Unattended Start Mode
2  SCSI Spin Up
3  Display Error Log
4  Remote Initial Program Load Setup
5  Change SCSI Id
6  Update System Firmware
7  Update Service Processor Firmware
8  Select Console





                                                                       .------.
                                                                       |X=Exit|
                                                                        ------'

===>
```

Figure 3-4. POWER3 SMP Node Utilities menu

See the following for option descriptions:

- “Set Passwords and Unattended Start Mode” on page 3-26
- “Utilities option 2” on page 3-26

- “Display Error Log” on page 3-26
- “Remote Initial Program Load Setup” on page 3-27
- “Change SCSI Id” on page 3-30
- “Update System Firmware” on page 3-30
- “Update Service Processor Firmware” on page 3-31
- “Select Console” on page 3-31

Set Passwords and Unattended Start Mode: This selection provides the following options:

```
RS/6000 Firmware
Version SPH99294
(c) Copyright IBM Corp. 1997  All rights reserved.
-------------------------------------------------------------------------------
Password Utilities

1  Set Power On Password
2  Remove Power On Password
3  Unattended Start Mode
4  Set Privileged-Access Password
5  Remove Privileged-Access Password










                                                                      .------.
                                                                      |X=Exit|
                                                                       ------'

===>
```

Set Power On Password: Set a power-on password to protect stored information. Use any combination of up to eight characters (A–Z, a–z, and 0–9) for your password. The password you type is not displayed. Press **Enter** when you are finished; you are required to type the password again for verification.

Remove Power On Password: If you previously set a power-on password and want to remove it, select this option.

Note: If you forget the power-on password, contact your service representative.

A password can be set only after the system is powered off and then powered on.

Unattended start mode: This option is not supported on SMP Thin and Wide Nodes.

Set Privileged-Access Password: The privileged-access password protects against the unauthorized start of system programs. This password can only be eight characters long.

Remove Privileged-Access Password: If you previously 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.

Utilities option 2: This option varies, depending on the node type.

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.  99/06/23 22:34:03 29000002              |
 | 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.

```
RS/6000 Firmware
Version SPH99294
(c) Copyright IBM Corp. 1997  All rights reserved.
-------------------------------------------------------------------------------
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.

```
RS/6000 Firmware
Version SPH99294
(c) Copyright IBM Corp. 1997  All rights reserved.
-------------------------------------------------------------------------------
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                          [255.255.255.000]

                                                                     .------.
                                                                     |X=Exit|
                                                                      ------'
===>
```

Select the Adapter Parameters option to view an adapter's hardware address as well as configure network adapters that require setup.

```
RS/6000 Firmware
Version SPH99294
(c) Copyright IBM Corp. 1997  All rights reserved.
-------------------------------------------------------------------------------
Device             Slot          Hardware Address

1 .  ethernet      Integrated    08005aba9604

                                                                     .------.
                                                                     |X=Exit|
                                                                      ------'
(PRESS ENTER AFTER MAKING SELECTION) ===>
```

Selecting option 1 displays the following Ethernet configuration menu:

```
RS/6000 Firmware
Version SPH99294
(c) Copyright IBM Corp. 1997  All rights reserved.
-------------------------------------------------------------------------------

IBM 10/100 Ethernet TP PCI Adaptert

1. Data Rate     [Auto]
2. Full Duplex   [Auto]









                                                                       .------.
                                                                       |X=Exit|
                                                                        ------'
===>
```

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.

```
RS/6000 Firmware
Version SPH99294
(c) Copyright IBM Corp. 1997  All rights reserved.
--------------------------------------------------------------------------------
Device            Slot         Hardware Address

1 .  ethernet      Integrated    006094e949e6














                                                                         .------.
                                                                         |X=Exit|
                                                                          ------'
(PRESS ENTER AFTER MAKING SELETION) ===>
```

After choosing which adapter to use to *ping* the remote system, you must provide the addresses needed to communicate with the remote system.

```
RS/6000 Firmware
Version SHP99294
(c) Copyright IBM Corp. 1997  All rights reserved.
--------------------------------------------------------------------------------
Ping IP Address

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                         [255.255.255.000]












.---------.                                                               .------.
|E=Execute|                                                               |X=Exit|
 ---------'                                                                ------'
===>
```

Change SCSI Id: This option allows you to view and change the addresses of the SCSI controllers attached to you computer.

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 file name of the firmware image file.

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 3-46.

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.

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.

```
RS/6000 Firmware
Version SPH99294
(c) Copyright IBM Corp. 1997  All rights reserved.
-------------------------------------------------------------------------------
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 are not configurable 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 node power is on and the service processor has detected a node 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 node. If the node logically powers down, service processor menus become available after 15 seconds.

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.

Note: The node power cable must be attached with inline circuit breakers On and the node power must be logically Off.

How to access service processor menus remotely

This function is not supported on SMP Thin and Wide Nodes.

Service processor menu options

Table 3-2 (Page 1 of 2). Service processor menus and menu options. An "X" in a column shows the menu or option is applicable to the node type shown in the heading of that column

Menu and menu options	332 MHz SMP	200 MHz POWER3 SMP	375 MHz POWER3 SMP	Reference page
Main Menu	X	X	X	3-34
1. Service Processor Setup Menu	X	X	X	3-35
1. Change Privileged Access Password	X	X	X	3-36
2. Change General Access Password	X	X	X	3-36
3.Enable/Disable Console Mirroring	X	X	X	3-36
4. Start Talk Mode	X	X	X	3-36
5. OS Surveillance Setup Menu	X	X	X	3-36
6. Reset Service Processor	X	X	X	3-36
7. Reprogram Service Processor Flash EPROM	X	X	X	3-36
8. Serial Port Snoop Setup Menu	X		X	3-36
98. Return to Previous Menu	X	X	X	
99. Exit from Menus	X	X	X	
2. System Power Control Menu	X	X	X	3-36
1. Enable/Disable Unattended Start Mode	X	X	X	3-37
2. Ring Indicate Power-On Menu	X	X	X	3-37
3. Reboot/Restart Policy Setup Menu	X	X	X	3-37
4. Power-On System	X	X	X	3-37
5. Power-Off System	X	X	X	3-37
6. Enable/Disable Fast System Boot		X	X	3-38
7. Boot Mode Menu			X	3-38
98. Return to Previous Menu				
99. Exit from Menus				
3. System Information Menu	X	X	X	3-39
1. Read VPD	X			3-39
1. Read VPD Image from Last System Boot		X	X	3-39
2. Read VPD Image from Last System Boot	X			3-39
2. Read Progress Indicators from Last System Boot		X	X	3-39
3. Read Progress Indicators from Last System Boot	X			3-39
3. Read Service Processor Error Logs		X	X	3-39
4. Read Service Processor Error Logs	X			3-39
4. Read System POST Errors		X	X	3-39

Table 3-2 (Page 2 of 2). Service processor menus and menu options. An "X" in a column shows the menu or option is applicable to the node type shown in the heading of that column				
Menu and menu options	**332 MHz SMP**	**200 MHz POWER3 SMP**	**375 MHz POWER3 SMP**	**Reference page**
5. Read System POST Errors	X			3-39
5. Read NVRAM		X	X	3-39
6. Read NVRAM	X			3-39
6. Read Service Processor Configuration		X	X	3-39
7. View System Environmental Conditions	X	X	X	3-39
8. Processor Configuration/Deconfiguration Menu		X	X	3-39
9. Memory Configuration/Deconfiguration Menu		X	X	3-40
10. Enable/Disable CPU Guard			X	3-41
11. Enable/Disable MEM Guard			X	3-42
98. Return to Previous Menu	X	X	X	
99. Exit from Menus	X	X	X	
4. Language Selection Menu	X	X	X	3-42
5. Call-In/Call-Out Setup Menu	X	X	X	3-42
1. Modem Configuration Menu				
2. Serial Port Selection Menu				
3. Serial Port Speed Setup Menu				
4. Telephone Number Setup Menu				
5. Call-Out Policy Setup Menu				
6. Customer Account Setup Menu				
7. Call-Out Test				
8. Ring Indicate Power-On Menu				
98. Return to Previous Menu	X	X	X	
99. Exit from Menus	X	X	X	
6. Set System Name	X	X	X	3-43

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 node during setup (if set).

The following screens show example node information as it appears for the specific nodes.

332 MHz SMP Nodes:

```
Service Processor Firmware
 Firmware level: wc990831
Copyright 1998, IBM Corporation
SVLAB1N05
```

200 MHz POWER3 SMP Thin and Wide Nodes:

```
Service Processor Firmware
  SP Level: px990712
  EPROM: 19981019
  FLASH: 19990712
Copyright 1998, IBM Corporation
```

375 MHz POWER3 SMP Thin and Wide Nodes:

```
Service Processor Firmware
  Firmware level: sh991112
Copyright 1998, IBM Corporation
```

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 node 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 node. The System Name is set from the Main Menu using option 6.

Service processor setup menu

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. Passwords have different names in the service processor and 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 node.

Enable/disable console mirroring: **This option is not supported on SMP Thin and Wide Nodes.**

Start talk mode: **This option is not supported on SMP Thin and Wide Nodes.**

OS Surveillance setup menu: This option may be used to setup operating system surveillance.

Surveillance May be set to Enable or Disable.

Surveillance time interval May be set to any number from 1 to 255.

Surveillance delay May be set to any number from 0 to 255.

Refer to "Service processor system monitoring - surveillance" on page 3-45 for more information about surveillance.

Reset service processor: Allows the user to reinitialize the service processor.

Reprogram service processor flash EPROM: **This option is not supported on SMP Thin and Wide Nodes.**

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 3-46.

Serial port snoop setup menu: This option is available for 375 MHz POWER3 SMP Thin and Wide Nodes only.

System reset string Use this option to enter the system reset string, which resets the machine when it is detected on the node's tty console. Set to Assigned or Unassigned.

Snoop serial port Use this option to select the Serial Port to Snoop.

Note: Only Serial Port 1 (node s1term/tty) is supported.

Serial Port Snooping allows the user to configure the serial port 1 as a 'catch-all' reset device. Once properly configured, at any point after the system unit is booted to AIX, whenever the reset string is typed on the console, the system unit uses the service processor reboot policy to restart. This action causes an EPOW (Early Power Off Warning) to be logged, and an AIX dump to be created if the machine is at an AIX prompt, with AIX in such a state that it can respond. If AIX cannot respond, the EPOW record is created, rather than the AIX dump. Pressing Enter after the reset string is not required, so the string should not be common or trivial. A mixed-case string is recommended.

System power control menu

Enable/disable unattended start mode: **This option is not supported on SMP Thin and Wide Nodes.**

Ring indicate power-on menu: Ring indicate power-on is an alternate method of dialing in, without establishing a service processor session. If the system is powered off and ring indicate power-on is enabled, the node is powered on at the predetermined number of rings. If the node is already on, no action is taken. In either case, the telephone call is not answered. The caller receives no feedback that the node powered-on.

Ring indicate power-on Set to Enabled or Disabled

Number of rings Set to any number greater than zero.

Reboot/restart policy setup menu:

Number of reboot attempts If the node 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. Option values are Yes or No, 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 3-43.

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. Available values for this option are Enabled or Disabled.

Power-on system:

Note: This option is not supported on the 332 MHz SMP Thin and Wide Nodes.

Lets you power-on the system immediately. For other power-on methods see “Node power-on methods” on page 3-43.

Power-off system:

Note: This option is not supported on the 332 MHz SMP Thin and Wide Nodes.

Allows the user to power-off the node following a surveillance failure.

Enable/disable fast system boot:

Note: This option is not supported on the 332 MHz SMP Thin and Wide Nodes.

Allows the user to power-off the node following a surveillance failure.

Available values for this option are Enabled or Disabled.

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.

Boot mode menu: The Boot Mode Menu allows users to configure the system to automatically start a specific function on the next boot-up. This configuration applies to the next boot only and are reset to the default state of being disabled following a successful boot attempt.

Boot to SMS menu Selecting this option causes the system to automatically enter the System Management Services menu during the boot process. Enabling this option is equivalent to pressing "1" on the open TTY window while the system initialization indicators are appearing on screen (see “Text-based System Management Services” on page 3-21).

Service mode boot from saved list This option causes system to boot from disk using the Maintenance Image (see “SERVICE mode (from disk)” on page 3-3). Enabling this option is equivalent to pressing "5" on the open TTY window while the system initialization indicators are appearing on screen.

Note: The device to boot from can be changed using SMS menu (see “Multiboot” on page 3-22).

Service mode boot from default list This option causes a Service Mode boot using the default boot list hard-coded into system firmware. The default list is set as follows:

1. Disk Drive
2. Network Adapter
    - Token-Ring
    - Ethernet

Enabling this option is equivalent to pressing "6" on the open TTY window while the system initialization indicators are appearing on screen.

Note: This option should only be used if booting using Saved List fails.

Boot to open firmware prompt When selected, the system will automatically enter Open Firmware prompt (also called he OK prompt). Enabling this option is equivalent to pressing "8" on the open TTY window while the system initialization indicators are appearing on screen (see “OK Prompt” on page 3-24).

If more than one option is enabled, the system will only act on the option corresponding to the smallest menu number. For example, if option 4 and 2 were enabled, the system would only look at option 2: Service Mode Boot from Saved List. After a boot attempt, all enabled options are disabled. In effect, the system throws away any menu options that are enabled after the option with the highest priority (the option with the smallest menu number) is executed.

The user can also override the choices in the boot mode menu while the system initialization indicators are appearing on screen. For example, if the user had enabled the system to enter the SMS menus (option 1) but hit the 8 key while the system initialization indicators are appearing on screen, the system would enter the Open Firmware prompt and disregard the settings in the Boot Mode Menu.

Note: The system initialization indicators are shown after the first time "RS/6000" is displayed on the TTY screen during system boot. You may select a boot mode from the TTY keyboard quickly after the words "MEMORY" and then "KEYBOARD" appear. You will also know when the initialization indicators are displayed by watching the operator panel or LCD display for the code E1F1.

System information menu

Read VPD: Displays manufacturer's vital product data, such as serial numbers, part numbers.

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.

The time stamp in this error log is Coordinated Universal Time, also known as 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). The node 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 configuration: 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.

Use this option to view and modify processor configuration. The following is an example of the Processor Configuration/Deconfiguration Menu:

```
           Processor Configuration/Deconfiguration Menu

Processor number
  0.  Configured by system (0x0)
  1.  Configured by system (0x0)
  2.  Configured by System (0x0)
  3.  Configured by system (0x0)
  98. Return to Previous Menu



To change the configuration, select the processor number
1>
```

You can manually configure or deconfigure any processor, regardless of failure status, through this service processor menu. The configuration process takes place during the system power-up. Therefore, the configuration displayed in STANDBY mode reflects the configuration during the last boot.

To view the current configuration, access the service processor menu after the system starts. When you select a processor, its state toggles between configured and deconfigured. Processors that are not present are not listed. A processor can be in any of the following four states:

- **Configured by system**: The processor is present, and has not exceeded the number of failure threshold. It is configured by the system and is available.
- **Deconfigured by system**: The processor is present, but has exceeded the number of failure threshold. It is deconfigured by the system and is currently unavailable
- **Manually configured**: The processor is present and available. It is configured by the user through the service processor menus.
- **Manually deconfigured**: The processor is present, but unavailable. It has been deconfigured by the user through the service processor menus.

Menu values are listed according to processor number. The values that pertain to the specific node types are:

0. Configured by system (0x0) 200 and 375 MHz POWER3 SMP Thin and Wide Nodes

1. Configured by system (0x0) 375 MHz POWER3 SMP Thin and Wide Nodes

2. Configured by system (0x0) 200 and 375 MHz POWER3 SMP Thin and Wide Nodes

3. Configured by system (0x0) 375 MHz POWER3 SMP Thin and Wide Nodes

Memory configuration/deconfiguration menu: Use this option only in conjunction with support center instruction.

Use this option to view and modify memory configuration. The following is an example of the Memory Configuration/Deconfiguration Menu:

```
            Memory Configuration/Deconfiguration Menu

DIMM's on memory card number 0 :
  0.  Configured by system  (0x0)      1.  Configured by system  (0x0)
  2.  Configured by system  (0x0)      3.  Configured by system  (0x0)
  4.  Configured by system  (0x0)      5.  Configured by system  (0x0)
  6.  Configured by system  (0x0)      7.  Configured by system  (0x0)
  8.  Configured by system  (0x0)      9.  Configured by system  (0x0)
 10.  Configured by system  (0x0)     11.  Configured by system  (0x0)
 12.  Configured by system  (0x0)     13.  Configured by system  (0x0)
 14.  Configured by system  (0x0)     15.  Configured by system  (0x0)

 DIMM's on memory card number 1 :
  0.  Configured by system  (0x0)      1.  Configured by system  (0x0)
  2.  Configured by system  (0x0)      3.  Configured by system  (0x0)
  4.  Configured by system  (0x0)      5.  Configured by system  (0x0)
  6.  Configured by system  (0x0)      7.  Configured by system  (0x0)
  8.  Configured by system  (0x0)      9.  Configured by system  (0x0)
 10.  Configured by system  (0x0)     11.  Configured by system  (0x0)
 12.  Configured by system  (0x0)     13.  Configured by system  (0x0)
 14.  Configured by system  (0x0)     15.  Configured by system  (0x0)

Enter card number and DIMM number separated by a space
1>
```

Note: Maximum memory is shown. Actual memory installed in a system is displayed on the menu.

The user can manually configure or deconfigure any memory DIMM (Dual Inline Memory Module) regardless of failure status, through this service processor menu. The configuration process takes place during the system power-up. Therefore, the configuration displayed in STANDBY mode reflects the configuration during the last boot.

To view the current configuration, access the service processor menu after the system starts. When you select a memory DIMM, its state will toggle between configured and deconfigured. Memory DIMMs that are not present are not listed. A memory DIMM can be in any of the following four states:

- **Configured by system**: The memory DIMM is present, and has not exceeded the number of failure threshold. It is configured by the system and is available.
- **Deconfigured by system**: The memory DIMM is present, but has exceeded the number of failure threshold. It is deconfigured by the system and is currently unavailable.
- **Manually configured**: The memory DIMM is present and available. It is configured by the user through the service processor menus.
- **Manually deconfigured**: The memory DIMM is present, but unavailable. It has been deconfigured by the user through the service processor menus.

Enable/disable CPU Guard: The following information pertains to 375 MHz POWER3 SMP Thin and Wide Nodes only.

CPU or processor run-time deconfiguration is a function implemented in the system firmware, service processor firmware and AIX operating system (4.3.4 version or later) for dynamically removing CPUs from the system configuration during run-time. The objective is to minimize system failures or data integrity exposures caused by a faulty processor. The processor to be removed is the one that has experienced repeated run-time recoverable internal error (over a predefined threshold). The function utilizes the hardware error detection logic in the processor to capture run-time recoverable error indications. The firmware uses the error signatures in the hardware to analyze and isolate the error to a specific CPU. The firmware also maintains error threshold information. When a processor internal recoverable error reaches a predefined threshold, the firmware notifies the AIX operating system. The AIX operating system migrates all software processes and interrupts to another processor and puts the faulty processor in "stop state". CPUs that are deconfigured at run time remain offline for subsequent reboots via the CPU Boot Time Deconfiguration function, until the faulty CPU hardware is replaced. The user can also enable or disable this function via the AIX system management function.

Available values for this option are Enabled or Disabled.

Enable/disable MEM Guard: The following information pertains to 375 MHz POWER3 SMP Thin and Wide Nodes only.

Memory boot time deconfiguration is a function implemented in the service processor firmware for removing a memory segment or DIMM from the system configuration at boot time. The objective is to minimize system failures or data integrity exposure caused by faulty memory hardware. The hardware resources to be removed are those experiencing the following failures:

- A boot-time test failure.
- Run-time recoverable errors over threshold prior to the current boot phase.
- Run-time unrecoverable errors prior to the current boot phase.

This function utilizes firmware Power-On Self Test (POST) to discover and isolate memory hardware failures during boot time. It also uses the hardware error detection logic in the memory controller to capture run-time recoverable and unrecoverable error indications. The firmware uses the error signatures in the hardware to analyze and isolate the error to specific memory segment or DIMM.

The memory segment or DIMM that are deconfigured remain off-line for subsequent reboots until the faulty memory hardware is replaced.

The function provides the option for you to manually deconfigure or re-enable a previously deconfigured memory segment or DIMM using the service processor menu. You can also enable or disable this function using the service processor menu.

Language selection menu

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.

Available language options include:

1. English
2. Francais
3. Deutsh
4. Italiano
5. Espanol
6. Svenska

Call-in/call-out setup menu

All functions specific to this menu are not supported on SMP Thin and Wide Nodes.

Set system name

A name given the node to which the service processor menus are currently being used. The name appears near the top of the main menu.

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 SMP Thin and Wide Nodes.
- Unattended start mode – not supported on this node.
- Timed power-on - refer to the `shutdown -t` command on nodes using AIX.

  Working in conjunction with AIX, the Service Processor in your node can operate a timer, much like the wake-up timer on your clock radio. You can set the timer so that your node powers on at a certain time after shutting down. The timer is battery operated, so power interruptions occurring while the node 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 node will power on at a predetermined number of rings. If the node is already on, no action is taken. In either case, the telephone call is not answered. The caller receives no feedback that the node 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.

   Refer to “Service processor reboot/restart recovery” on page 3-43.

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	

OS automatic reboot/restart after crash setting	Service processor to use OS-defined restart policy?	Service processor enable supplemental restart policy?	System response
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 bring up (automatic) and
2. Operating system run time (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 7 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 node 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 3-47. Otherwise, refer to the downloaded update instructions, the System Management Services, or Service Processor menus on page 3-35, 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.

   `WILyyjjj.IMG` - image file used for system firmware
   `wcyymmdd.bin` - binary file used to burn the service processor EEPROM
   `wcyymmdd.img` - image file used for service processor Flash update
   (where: yy=year, jjj=julian date, mm=month, dd=day)

2. Transfer the firmware file(s) to the control workstation. The file can be put into any directory. Creating a firmware directory or using **/tmp** is suggested.
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** 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 file name 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.

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).......Lyyjjj

- SP_CARD_
    ...
    ROM Level (non-alterable)...yyyymmdd
    ROM Level (alterable).......yyyymmdd
```

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 file name 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

19970626223337  0. Loss of Redundant Fan #5
                     40210091



   Press "C" to clear error log. Press "Enter" to continue.  >
```

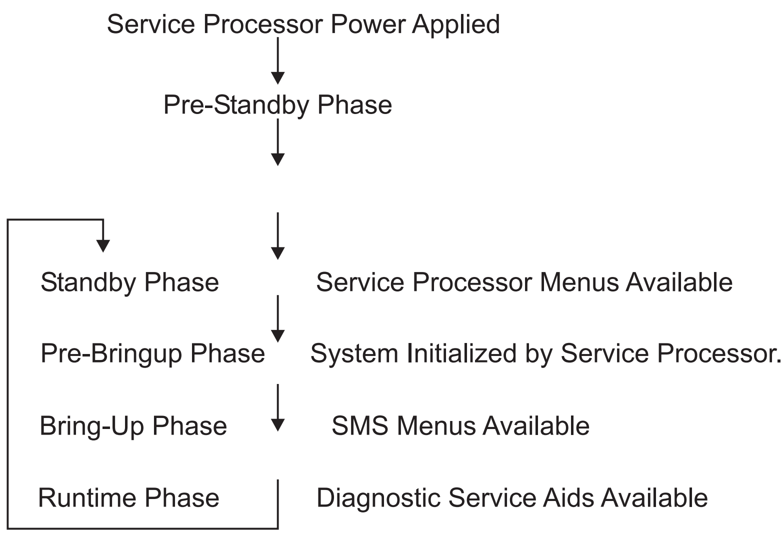
The time stamp in this error log is Coordinated Universal Time (CUT), also known as. Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp with local time.

System POST errors

If POST (Power-On Self Test) errors occur during startup, this error log help isolate faults when used with the diagnostics.

Service processor operational phases

This section provides a high-level flow of the phases of the service processor.



Pre-standby phase

This phase is entered when the node is connected to a power source. The node 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 any necessary hardware and 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 node. 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 node OFF and power connected (the normal path), recognized by `OK` in the LCD display.
2. With the node 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

  The service processor will configure the modem (if installed) so that incoming calls may be received, or outgoing calls may be placed.

- Dial In

  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 node 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).

Bring-up phase

This phase is entered upon power-on, and exited upon loading of the operating system.

The Bring-up 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

  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 nodes).

- 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 Bring up 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 3-2 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 *7012 POWERstation and POWERserver: Installation and Service Guide* (SA23-2624) for the Thin Node component, the *7013 POWERstation and POWERserver: Installation and Service Guide* (SA23-2622) for the Wide Node component, or the *7015 Models R30, R40, and R50 CPU Enclosure Installation and Service Guide* (SA23-2743) for the 604 or 604e High Node.

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.

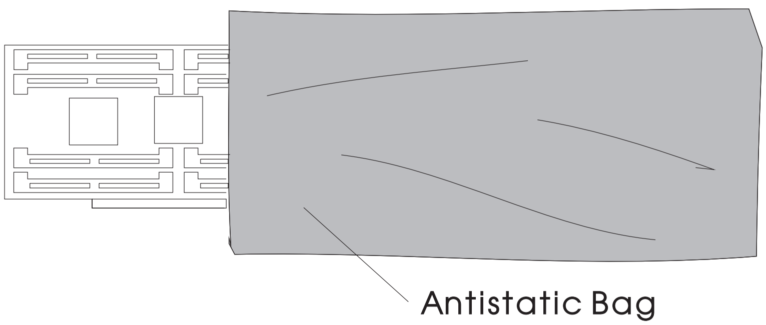


Figure 4-1. Handling an anti-static device

Service procedures for 332 MHz SMP Thin and Wide Nodes

These procedures cover the removal and replacement of the 332 MHz SMP Wide and Thin Node components.

Note: A 5.5 mm socket is required to perform some of the following service procedures.

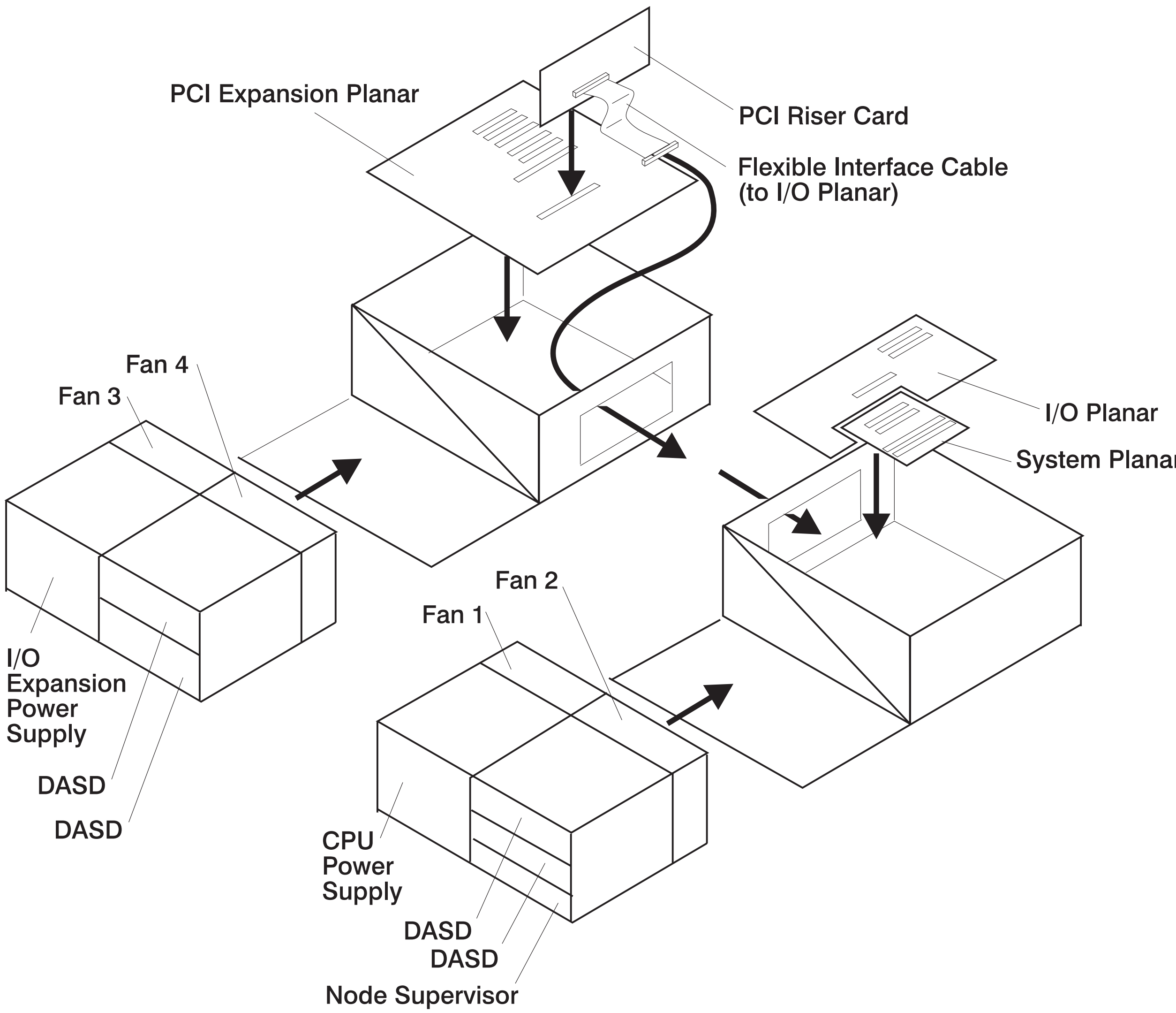


Figure 4-2. 332 MHz SMP Node high level component diagram

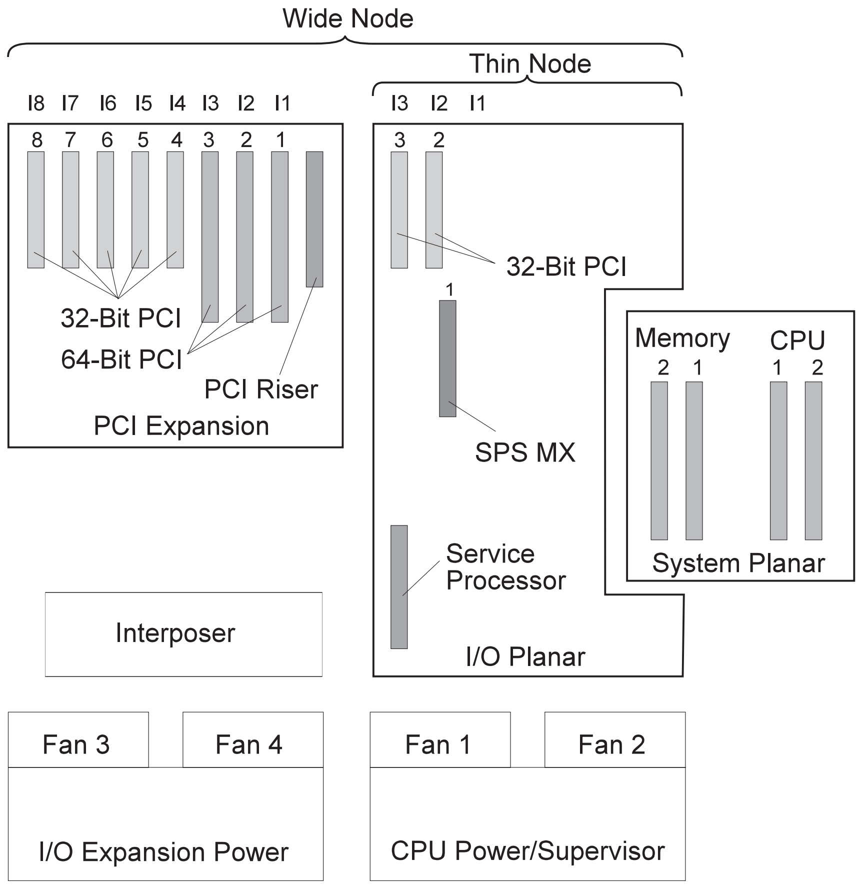


Figure 4-3. 332 MHz SMP Node (top view)

Removing a 332 MHz SMP Thin Node

1. If necessary, fence the node from the system.
2. Ensure that the Thin Node is offline (shutdown) and powered off from the control workstation.
3. Ensure the Thin Node power supply switch is in the Off (‘0’) position.
4. Ensure the 48-volt input cable switch is in the Off (‘0’) position.
5. Remove all attached cables from the rear of the Thin Node.
6. After removing the 48-volt input cable, place a protective cover (part number 48G3055) over the plug end. The cover is supplied with the ship group.
7. Remove the CPU power assembly using the steps in “Removing the CPU and I/O expansion power assemblies” on page 4-7.
8. Remove the hold-down screws located at the rear of the Thin Node.
9. Remove the Thin Node from the front of the frame.
10. Return to the procedure that directed you here.

Replacing a 332 MHz SMP Thin Node

1. Reinstall the Thin Node in the front of the frame.
2. Reinstall the hold-down screws located at the rear of the Thin Node.
3. Reinstall the CPU power assembly using the steps in “Replacing the CPU and I/O expansion power assemblies” on page 4-7.
4. Remove the protective cover (part number 48G3055) from the 48-volt input cable in J8. Ensure the alignment arrow is pointing to the bottom of the connector. Store the protective cover with the ship group tools.
5. Reattach all cables that were removed from the rear of the Thin Node.

6. Ensure the 48-volt input cable switch is in the On ('1') position.
7. Ensure the Thin Node power supply switch is in the On ('1') position.
8. If necessary, unfence the node.
9. Return to the procedure that directed you here.

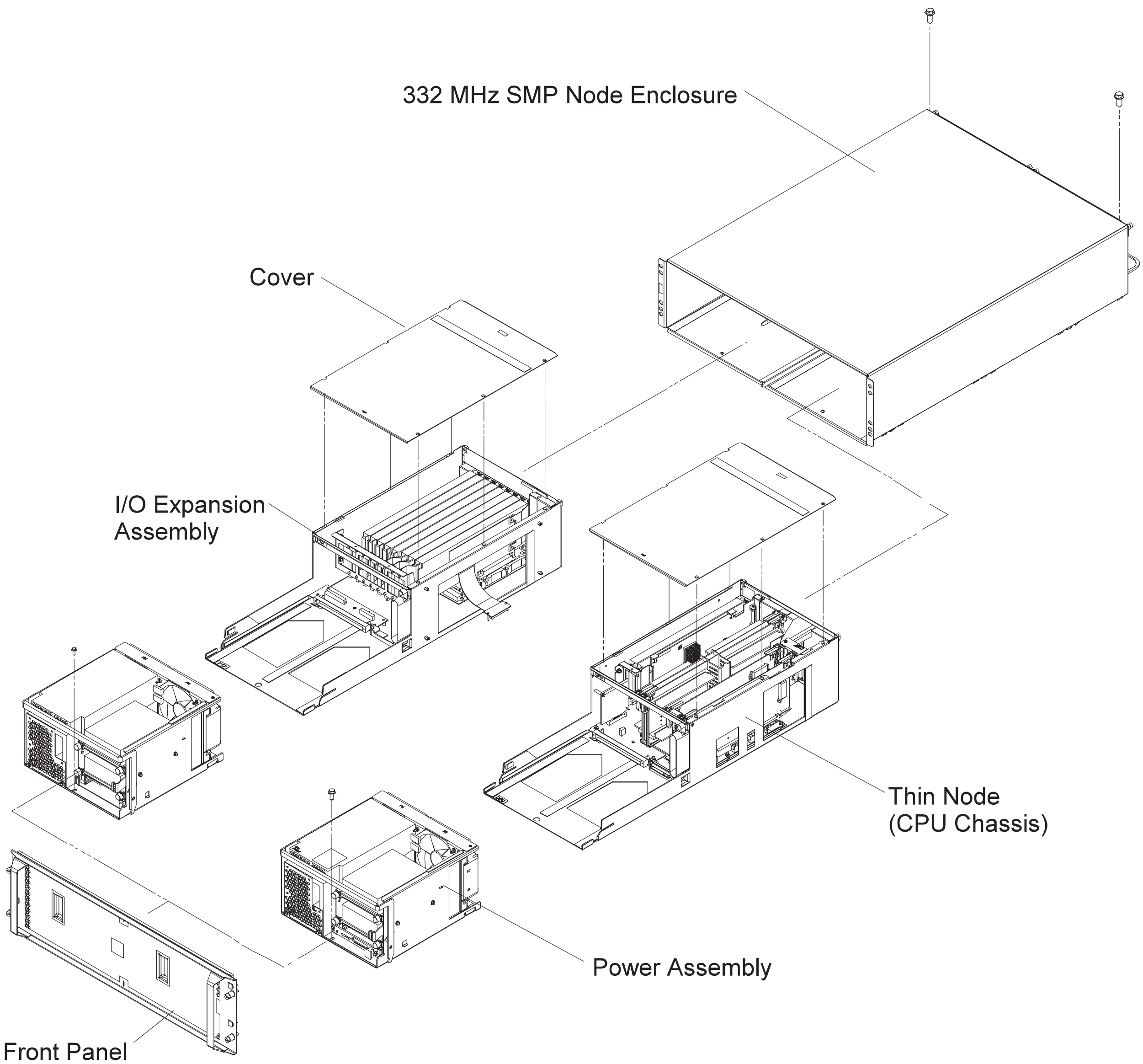


Figure 4-4. 332 MHz SMP Thin and Wide Nodes

Removing a 332 MHz SMP Wide Node

1. If necessary, fence the node from the system.
2. Ensure that the node is offline (shutdown) and powered off from the control workstation.
3. Ensure the Wide Node power supply switches are in the Off ('0') position.
4. Ensure the 48-volt input cable switches are in the Off ('0') position.
5. Remove all attached cables from the rear of the node.
6. After removing the 48-volt input cables, place protective covers (part number 48G3055) over the plug ends. The covers are supplied with the ship group.
7. Remove the CPU power assembly and the I/O expansion power assembly using the steps in "Removing the CPU and I/O expansion power assemblies" on page 4-7.
8. Remove the hold-down screws located at the rear of the node.

9. Remove the Wide Node from the front of the frame.
10. Return to the procedure that directed you here.

Replacing a 332 MHz SMP Wide Node

1. Reinstall the Wide Node in the front of the frame.
2. Reinstall the hold-down screws located at the rear of the node.
3. Reinstall the CPU power assembly and the I/O expansion power assembly using the steps in "Replacing the CPU and I/O expansion power assemblies."
4. Remove the protective covers (part number 48G3055) from the 48-volt input cables. Store the protective covers with the ship group tools.
5. Connect the cable to both J8 connectors. Ensure the alignment arrows are pointing to the bottom of the connectors.
6. Reattach all of the cables that were removed from the rear of the node.
7. Ensure the 48-volt input cable switches are in the On ('1') position.
8. Ensure the Wide Node power supply switches are in the On ('1') position.
9. If necessary, unfence the node.
10. Return to the procedure that directed you here.

Removing the CPU and I/O expansion power assemblies

1. Ensure that the processor node is offline (shutdown) and powered off from the control workstation.
2. Ensure the node power supply circuit breakers in the Off ('0') position.
3. Ensure the 48-volt input cable in-line circuit breakers are in the Off ('0') position.
4. Remove the front cover panel by removing the screws. Retain the screws for later installation.
5. If necessary, unplug the 4-drop DASD cable from the I/O expansion assembly.
6. Remove the retaining screw at the front of the power assembly and retain for later use.
7. Pull forward and down on the power interlock bar to unlatch and remove the power assembly.
8. If you are replacing the power assembly with a new assembly, continue with 9. Otherwise, return to the procedure that directed you here.
9. Remove the supervisor card using the steps in "Removing the node supervisor card" on page 4-10.
10. Record the current DASD locations, then remove the DASD using the steps in "Removing the DASD" on page 4-10.
11. Return to the procedure that directed you here.

Replacing the CPU and I/O expansion power assemblies

1. If you are replacing the power assembly with a new assembly, continue with 2, otherwise go to 4.
2. Install the supervisor card, removed from the old power assembly, using the steps in "Replacing the node supervisor card" on page 4-10.
3. Install the DASD (removed from the old power assembly) in the locations recorded in the removal procedure, using the steps in "Replacing the DASD" on page 4-11.
4. Install and latch the power assemblies by lifting and pushing forward on the power interlock bar.
5. Ensure the power interlock tab is engaged by pushing in on the tab.
6. Secure the front of the power assemblies with the retaining screw that was previously removed.
7. If necessary, plug the 4-drop DASD cable in the I/O expansion assembly.
8. Install the front cover panel using the screws that were previously removed.
9. Push up and back on the power interlock bar until the power assembly is engaged and locked.
10. Push the power interlock tab marked 'PUSH' at the right side front of the power assembly to engage the power connections.
11. Ensure the 48-volt input cable in-line circuit breakers are in the On ('1') position.
12. Ensure the node power supply circuit breakers are in the On ('1') position.
13. Return to the procedure that directed you here.

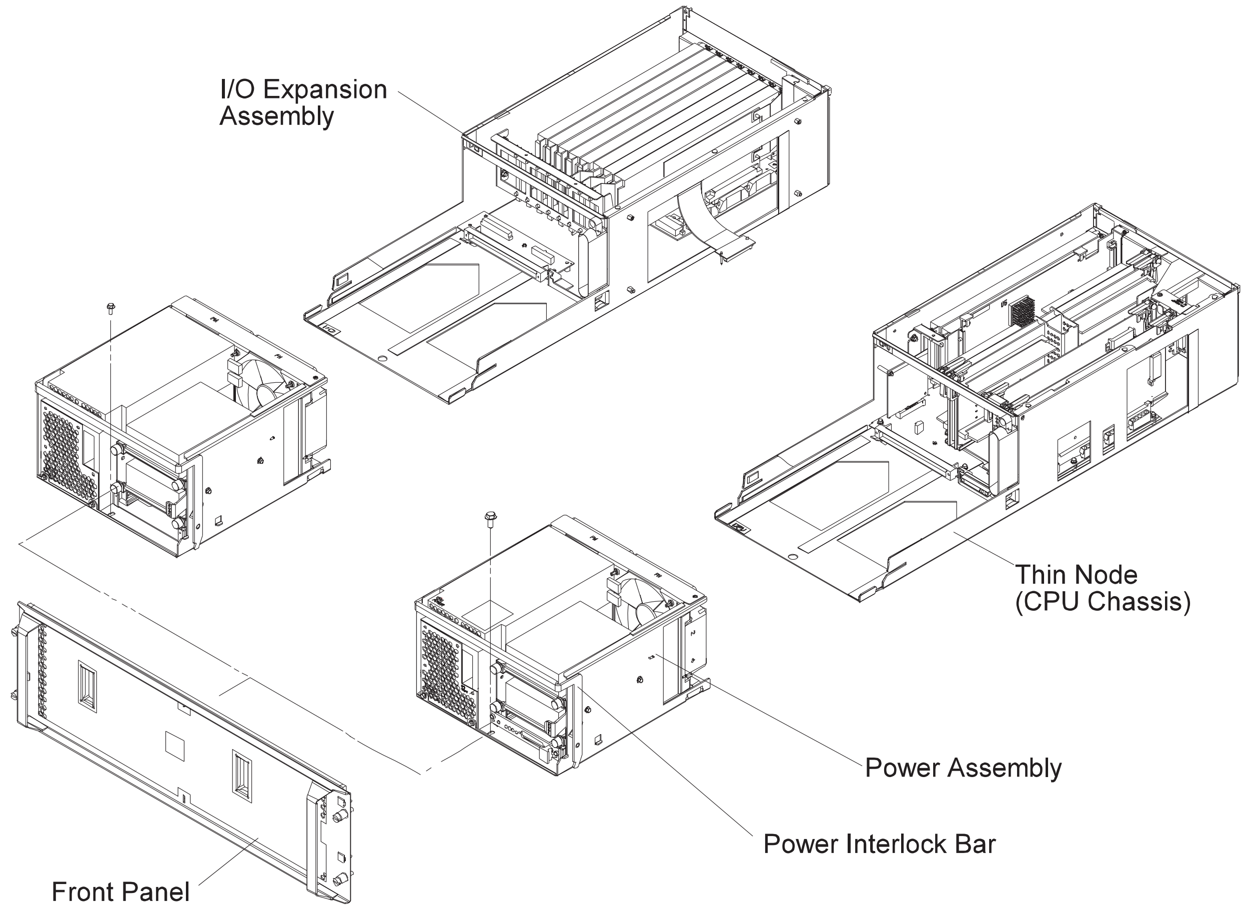


Figure 4-5. 332 MHz SMP Node power assemblies

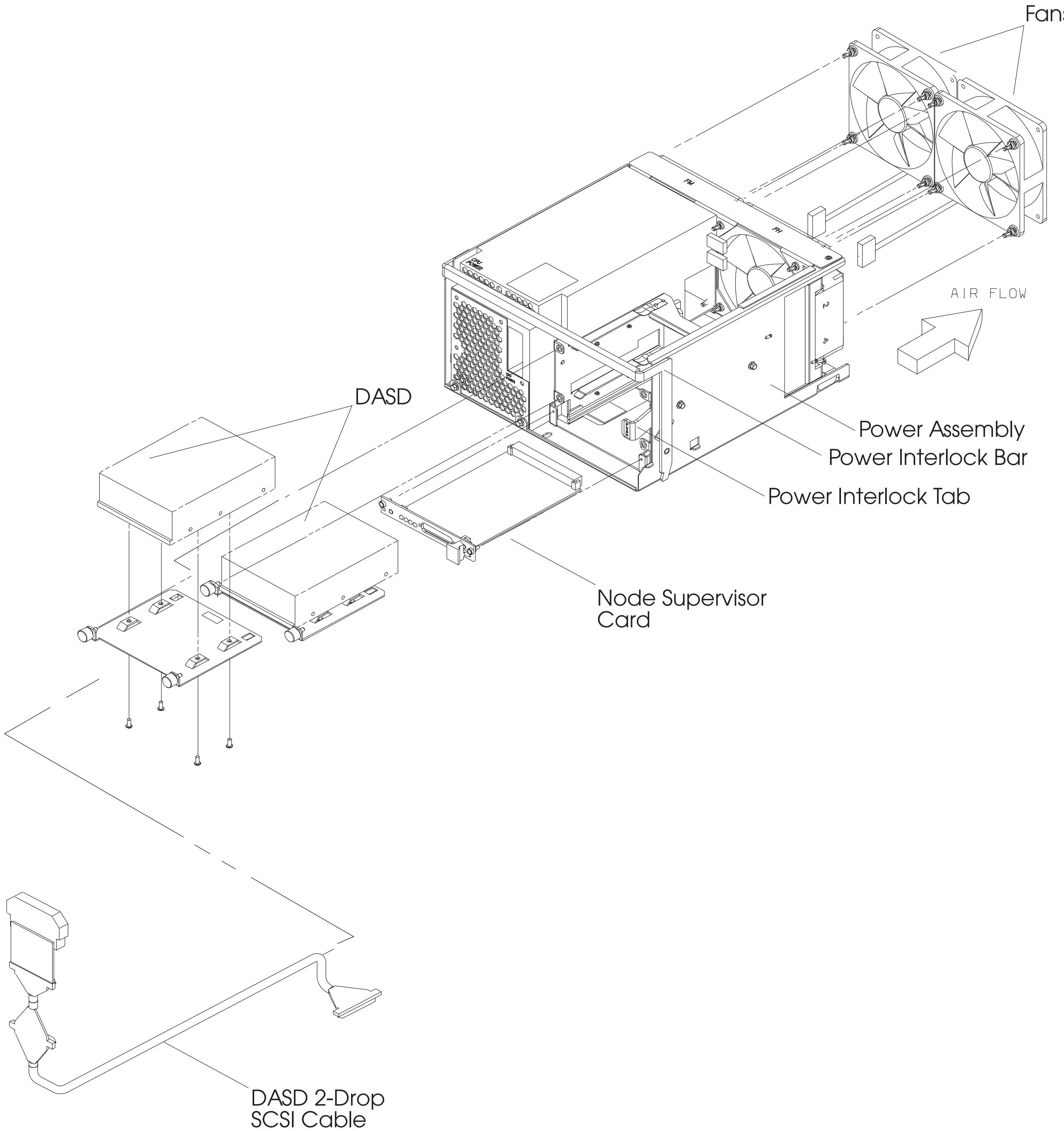


Figure 4-6. 332 MHz SMP Node power assembly components

Removing the fan(s)

1. Ensure ESD antistatic wrist device is attached.
2. Remove the power assembly using the steps in "Removing the CPU and I/O expansion power assemblies" on page 4-7.
3. Remove the screw from the top of the fan bracket.
4. Loosen the screw on the side of the fan bracket.
5. Lift the fan bracket from the power assembly.
6. Locate and disconnect the fan plug.
7. Remove the shock mounts from the bracket and retain for later installation.

Replacing the fan(s)

1. Install the shock mounts, removed from the old fan, to the replacement fan.
2. Install the fan with the wires to the bottom and the airflow indicator pointing to the rear of the chassis.
3. Connect the fan plug.
4. Reinstall the fan bracket.
5. Install 1 screw on the top and 1 screw on the side of the fan bracket.
6. Check that no cable touches the fan.
7. Reinstall the power assembly using the steps in “Replacing the CPU and I/O expansion power assemblies” on page 4-7.
8. Return to the procedure that directed you here.

Removing the node supervisor card

1. Ensure ESD antistatic wrist device is attached.
2. Remove the front cover panel by removing the screws. Retain the screws for later installation.
3. Remove the screws holding the node supervisor card to the mounting bracket. Retain the screws for later installation.
4. Remove the 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 3-14 or *IBM Parallel System Support Programs for AIX: Installation Guide* for this procedure.

1. Ensure ESD antistatic wrist device is attached.
2. Firmly seat the node supervisor card in the mounting bracket and secure with the screws that were previously removed.
3. Install the front cover panel using the screws that were previously removed.
4. Perform “Updating the node supervisor code” on page 3-13.
5. Return to the procedure that directed you here.

Removing the DASD

1. Ensure ESD antistatic wrist device is attached.
2. Remove the front cover panel by removing the screws. Retain the screws for later installation.
3. Disconnect the SCSI cable and the power cable.
4. Record the DASD location.
5. Remove the screws that secure the DASD tray to the power assembly. Retain the screws for later installation.
6. Slide the DASD tray from the front of the power assembly.
7. Remove the screws that secure the DASD to the DASD tray. Retain the screws for later installation.
8. Remove the DASD from the DASD tray.
9. Check the jumper position(s) on the DASD, if any. Record the settings for the replacement DASD.

   Note: Ensure the grounding strips located around the edges are firmly in place.

Replacing the DASD

1. Ensure ESD antistatic wrist device is attached.
2. Set the jumper position(s) on the new DASD, if any, using the settings you recorded in the removal procedure.
3. Ensure all required DASD jumpers are installed. Refer to *Adapters, Devices, and Cable Information for Multiple Bus Systems*, SA38-0516, for the required jumper information.
4. Install the DASD in the DASD tray using the screws that were previously removed.
5. Reinstall the DASD tray into the front of the power assembly and secure with the screws that were previously removed.
6. Connect the SCSI cable and power cable to the DASD.
7. Install the front cover panel using the screws that were previously removed.
8. Return to the procedure that directed you here.

Removing the SPS MX adapter card

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP node using the steps in "Removing a 332 MHz SMP Thin Node" on page 4-5 or "Removing a 332 MHz SMP Wide Node" on page 4-6.
3. Remove the Thin Node cover by loosening the screws on top of the cover.
4. Loosen the screw at the top of the rear card guide and remove the SPS MX adapter card from the Thin Node system planar slot J9.
5. Remove the protective cover from port P1 and retain for later use.

Replacing the SPS MX adapter card

1. Ensure ESD antistatic wrist device is attached.
2. Install the protective cover, that was previously removed, on port P1, if necessary.
3. Install the SPS MX adapter card in the Thin Node system planar slot J9 and tighten the screw at the top of the rear card guide.
4. Reinstall the Thin Node cover by tightening the screws on top of the cover.
5. Reinstall the 332 MHz SMP node using the steps in "Replacing a 332 MHz SMP Thin Node" on page 4-5 or "Replacing a 332 MHz SMP Wide Node" on page 4-7.
6. Return to the procedure that directed you here.

Removing the PCI adapter card

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP node using the steps in "Removing a 332 MHz SMP Thin Node" on page 4-5 or "Removing a 332 MHz SMP Wide Node" on page 4-6.
3. Remove the I/O expansion assembly cover or the Thin Node cover (depending on the location of the PCI adapter card) by loosening the screws on top of the assembly.
4. Loosen the knurled knob, for this adapter, at the rear of the assembly.
5. Check for (and record) internal connections to other adapter cards or cables before removing them.
6. If the adapter card has a card extender, holding the front end of the adapter, release the extender by pressing the locking tab to the side.
7. Place plastic inserts, from the ship group, on either side of the card to be removed.
8. Grasp the adapter by the pull tabs and pull it out of the slot.

Replacing the PCI adapter card

1. Ensure ESD antistatic wrist device is attached.
2. Check for any jumpers or switches to be set on this card, then set as appropriate.
3. If the adapter card requires a card extender, attach the extender to the front end of the adapter and lock in place with locking tab.
4. Align the adapter in the slot, then push the card into the slot.
5. Remove the plastic inserts, previously used for card removal, and return them to the ship group.
6. Tighten the knurled knob, for this adapter, at the rear of the assembly.
7. If this card has any internal connections to other adapter(s) or cables, connect them, as appropriate.
8. Reinstall the I/O expansion assembly cover or the Thin Node cover (depending on the location of the PCI adapter card) by tightening the screws on top of the assembly.
9. Reinstall the 332 MHz SMP node using the steps in "Replacing a 332 MHz SMP Thin Node" on page 4-5 or "Replacing a 332 MHz SMP Wide Node" on page 4-7.
10. Return to the procedure that directed you here.

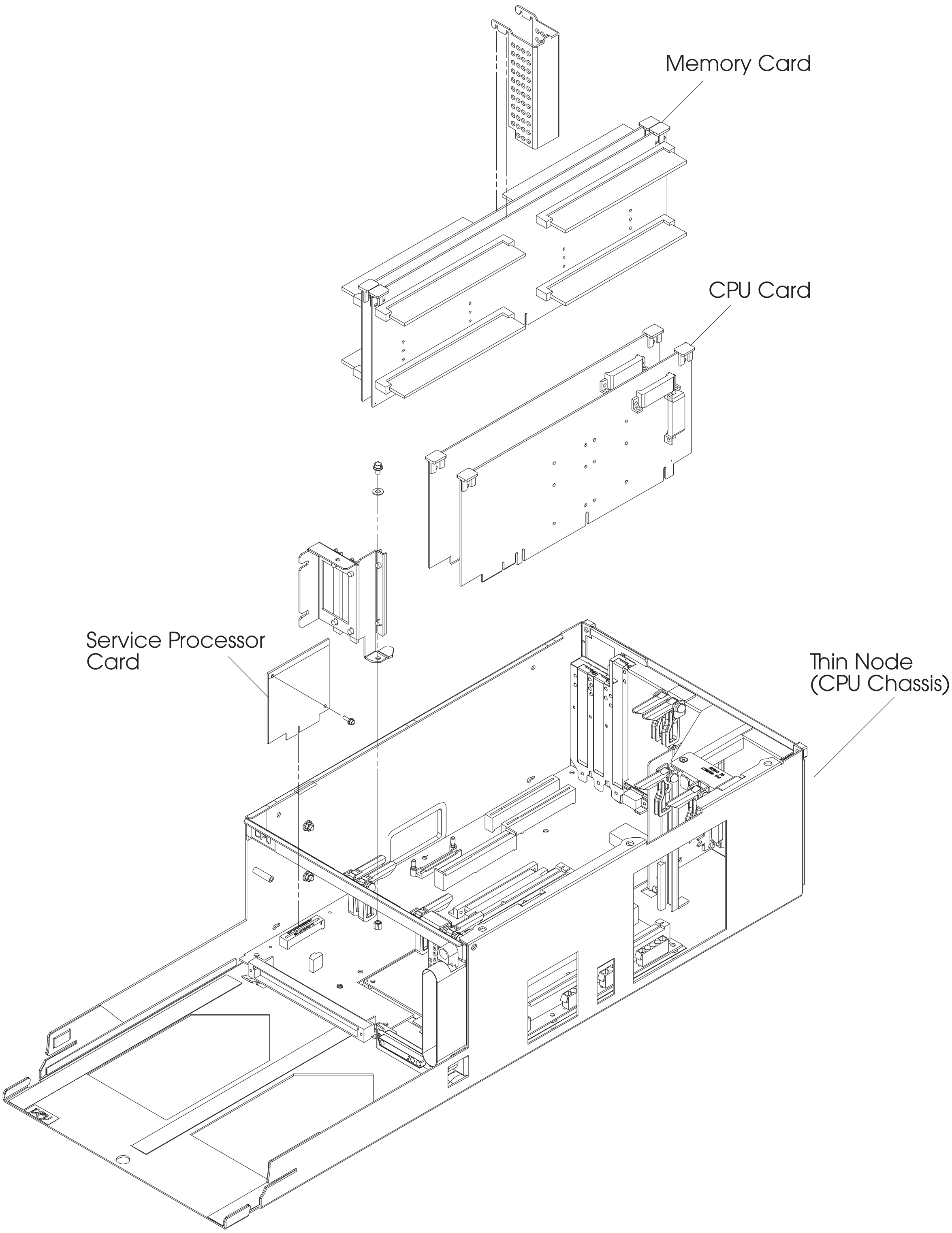


Figure 4-7. 332 MHz SMP Node Thin Node components (1 of 2)

Removing the service processor

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP node using the steps in “Removing a 332 MHz SMP Thin Node” on page 4-5 or “Removing a 332 MHz SMP Wide Node” on page 4-6.
3. Remove the Thin Node cover by loosening the screws on top of the thin node.
4. Remove the screw securing the service processor card to the I/O planar. Retain the screw for later installation.
5. Remove the service processor card from connector J1 on the I/O planar.

Replacing the service processor

1. Ensure ESD antistatic wrist device is attached.
2. Install the service processor card in connector J1 on the I/O planar.
3. Install the screw (retained from the removal procedure) to secure the service processor card to the I/O planar. Retain the screw for later installation.
4. Reinstall the Thin Node cover by tightening the screws on top of the thin node.
5. Reinstall the 332 MHz SMP node using the steps in “Replacing a 332 MHz SMP Thin Node” on page 4-5 or “Replacing a 332 MHz SMP Wide Node” on page 4-7.
6. If necessary, update the service processor firmware. See “Installing firmware updates on SP nodes” on page 3-15.
7. Return to the procedure that directed you here.

Removing the memory card

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP node using the steps in “Removing a 332 MHz SMP Thin Node” on page 4-5 or “Removing a 332 MHz SMP Wide Node” on page 4-6.
3. Remove the cover by loosening the screws on top of the assembly.

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

4. Pull up on the thumb locks to disengage the memory card.
5. Remove the memory card.

Replacing the memory card

1. Ensure ESD antistatic wrist device is attached.

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

2. Align the memory card with the slot.
3. Push down on the thumb locks to engage the memory card.
4. Reinstall the cover by tightening the screws on top of the assembly.
5. Reinstall the 332 MHz SMP node using the steps in “Replacing a 332 MHz SMP Thin Node” on page 4-5 or “Replacing a 332 MHz SMP Wide Node” on page 4-7.
6. Return to the procedure that directed you here.

Removing the CPU card

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP node using the steps in “Removing a 332 MHz SMP Thin Node” on page 4-5 or “Removing a 332 MHz SMP Wide Node” on page 4-6.
3. Remove the cover by loosening the screws on top of the assembly.

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

4. Pull up on the thumb locks to disengage the CPU card.

Attention: *Do not* grasp the card by the heat sink when plugging or unplugging. This will damage the processor chip.

5. Remove the CPU card.

Replacing the CPU card

1. Ensure ESD antistatic wrist device is attached.

Attention: *Do not* grasp the card by the heat sink when plugging or unplugging. This will damage the processor chip.

2. Align the CPU card with the slot.

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

3. Push down on the thumb locks to engage the CPU card.
4. Reinstall the cover by tightening the screws on top of the assembly.
5. Reinstall the 332 MHz SMP node using the steps in “Replacing a 332 MHz SMP Thin Node” on page 4-5 or “Replacing a 332 MHz SMP Wide Node” on page 4-7.
6. Return to the procedure that directed you here.

Removing the Thin 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 2-11). 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.

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP Thin Node using the steps in “Removing a 332 MHz SMP Thin Node” on page 4-5.
3. Remove the Thin Node cover by loosening the screws on top of the node.
4. Remove the PCI card(s) using the steps in “Removing the PCI adapter card” on page 4-11.
5. Remove the SPS MX adapter card, if present, using the steps in “Removing the SPS MX adapter card” on page 4-11.
6. Remove the PCI card guide rail.
7. Remove the service processor card using the steps in “Removing the service processor” on page 4-14.
8. Remove the memory card(s) using the steps in “Removing the memory card” on page 4-14.
9. Remove the CPU card(s) using the steps in “Removing the CPU card.”

10. Remove the plastic insulator.
11. Remove the I/O expansion control cable using the steps in "Removing the I/O expansion control cable" on page 4-24.
12. Remove the Ethernet BNC nut and washer.
13. Remove the 9 screws securing the I/O planar.
14. Remove the 8 screws securing the system planar.
15. Unseat the I/O planar from the locator pin.

Attention: Components on the underside of the I/O planar can be damaged by the chassis standoffs. Keep the planar elevated, at an angle, when servicing the planar.

16. Separate the I/O planar and the system planar.
17. Slide the I/O planar out from the chassis through the power side.

Replacing the Thin 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 2-11). 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 Thin 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 3-14 or *IBM Parallel System Support Programs for AIX: Installation Guide* for this procedure.

Note: Inform the customer that the MAC address will need to be updated, see "Updating the Ethernet hardware address" on page 3-6 for this procedure.

1. Ensure ESD antistatic wrist device is attached.
2. Slide the I/O planar into the chassis.

Attention: Install the I/O planar at an angle. Insert the BNC connector through the back wall first. Then set the planar in position with the holes aligned with the standoffs. **Setting the planar flat on the standoffs, then sliding it to the rear to access the BNC will damage the components on the underside of the planar.**

3. Attach the I/O planar to the system planar.
4. Seat the I/O planar at the locator pin.
5. Reinstall the 8 screws to secure the system planar.
6. Reinstall the 9 screws to secure the I/O planar.
7. Reinstall the Ethernet BNC nut and washer.
8. Reinstall the I/O expansion control cable using the steps in "Replacing the I/O expansion control cable" on page 4-24.
9. Reinstall the plastic insulator.
10. Install the PCI card guide rail.
11. Replace the PCI card(s) using the steps in "Replacing the PCI adapter card" on page 4-12.
12. Reinstall the SPS MX adapter card, if present. using the steps in "Replacing the SPS MX adapter card" on page 4-11.

13. Replace the service processor card using the steps in “Replacing the service processor” on page 4-14.
14. Replace the memory card(s) using the steps in “Replacing the memory card” on page 4-14.
15. Replace the CPU card(s) using the steps in “Replacing the CPU card” on page 4-15.
16. Reinstall the Thin Node cover by tightening the screws on top of the node.
17. Reinstall the 332 MHz SMP Thin Node using the steps in “Replacing a 332 MHz SMP Thin Node” on page 4-5.
18. If necessary, update the service processor firmware. See “Installing firmware updates on SP nodes” on page 3-15.
19. Return to the procedure that directed you here.

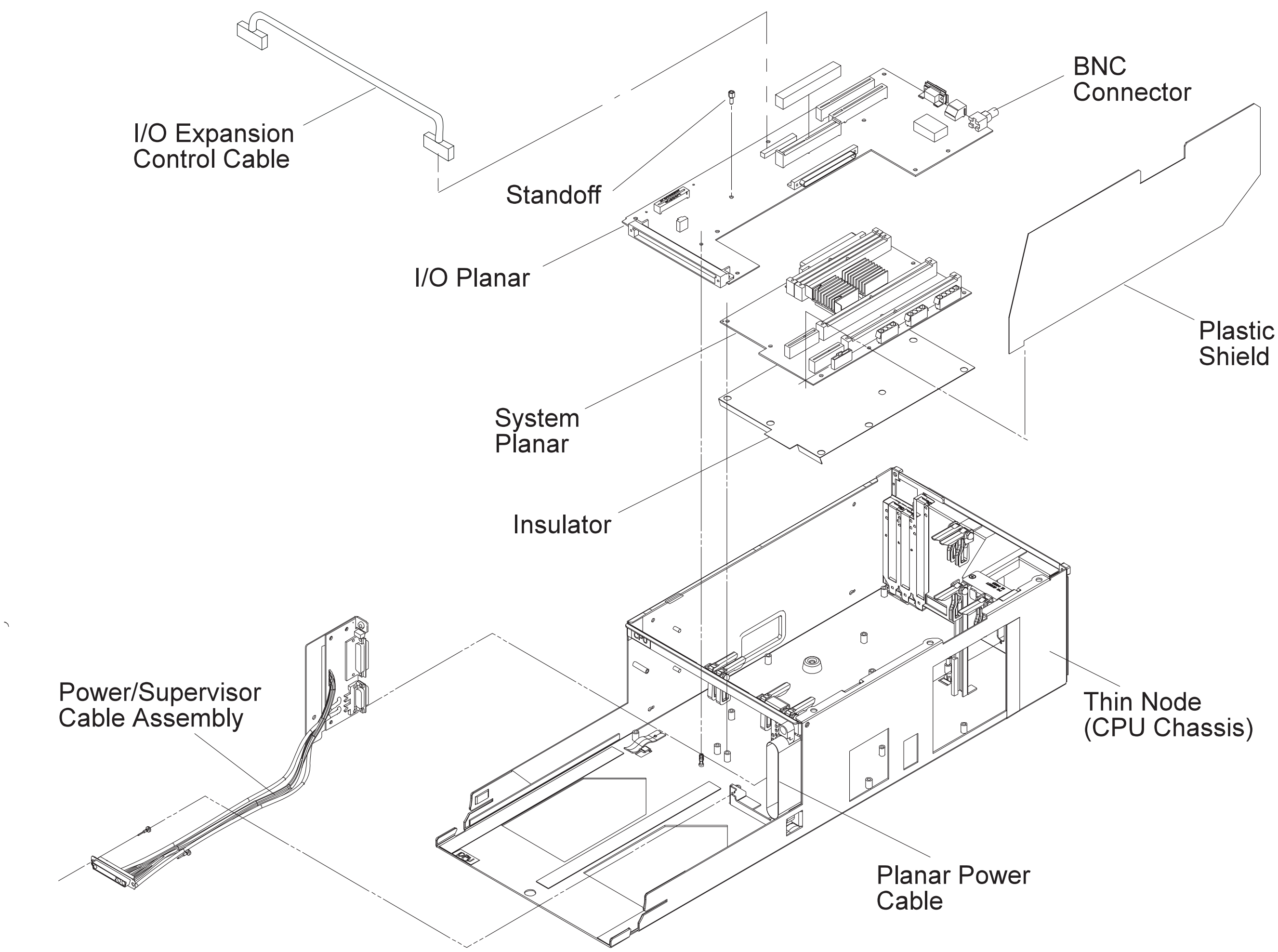


Figure 4-8. 332 MHz SMP Node Thin Node components (2 of 2)

Removing the Thin Node system planar

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP Thin Node using the steps in “Removing a 332 MHz SMP Thin Node” on page 4-5.
3. Remove the Thin Node cover by loosening the screws on top of the node.
4. Remove the PCI card(s) using the steps in “Removing the PCI adapter card” on page 4-11.
5. Remove the SPS MX adapter card, if present, using the steps in “Removing the SPS MX adapter card” on page 4-11.
6. Remove the PCI card guide rail.

7. Remove the service processor card using the steps in "Removing the service processor" on page 4-14.
8. Remove the memory card(s) using the steps in "Removing the memory card" on page 4-14.
9. Remove the CPU card(s) using the steps in "Removing the CPU card" on page 4-15.
10. If installed, remove the metal card guides from the CPU and memory card positions.
11. Remove the plastic insulator.
12. Remove the Ethernet BNC nut and washer.
13. Remove the 3 power plugs from the chassis side of the system planar.
14. Remove the 9 screws securing the I/O planar.
15. Remove the 8 screws securing the system planar.
16. Unseat the I/O planar from the locator pin.

Attention: Components on the underside of the I/O planar can be damaged by the chassis standoffs. Keep the planar elevated, at an angle, when servicing the planar.

17. Separate the I/O planar and the system planar.
18. Remove the system planar from the chassis.

Replacing the Thin Node system planar

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 3-14 or *IBM Parallel System Support Programs for AIX: Installation Guide* for this procedure.

Note: Inform the customer that the MAC address will need to be updated, see "Updating the Ethernet hardware address" on page 3-6 for this procedure.

1. Ensure ESD antistatic wrist device is attached.
2. Reinstall the system planar into the chassis.
3. Attach the I/O planar to the system planar.
4. Seat the I/O planar at the locator pin.

Attention: Install the I/O planar at an angle. Insert the BNC connector through the back wall first. Then set the planar in position with the holes aligned with the standoffs. **Setting the planar flat on the standoffs, then sliding it to the rear to access the BNC will damage the components on the underside of the planar.**

5. Reinstall the 8 screws to secure the system planar.
6. Reinstall the 9 screws to secure the I/O planar.
7. Reinstall the 3 power plugs to the chassis side of the system planar.
8. Reinstall the Ethernet BNC nut and washer.
9. Reinstall the plastic insulator.
10. Install the PCI card guide rail.
11. Replace the PCI card(s) using the steps in "Replacing the PCI adapter card" on page 4-12.
12. Reinstall the SPS MX adapter card, if present, using the steps in "Replacing the SPS MX adapter card" on page 4-11.
13. Replace the service processor card using the steps in "Replacing the service processor" on page 4-14.
14. If previously removed, reinstall the metal card guides to the CPU and memory card positions.
15. Replace the memory card(s) using the steps in "Replacing the memory card" on page 4-14.
16. Replace the CPU card(s) using the steps in "Replacing the CPU card" on page 4-15.
17. Reinstall the Thin Node cover by tightening the screws on top of the node.
18. Reinstall the 332 MHz SMP Thin Node using the steps in "Replacing a 332 MHz SMP Thin Node" on page 4-5.

19. If necessary, update the service processor firmware. See “Installing firmware updates on SP nodes” on page 3-15.
20. Return to the procedure that directed you here.

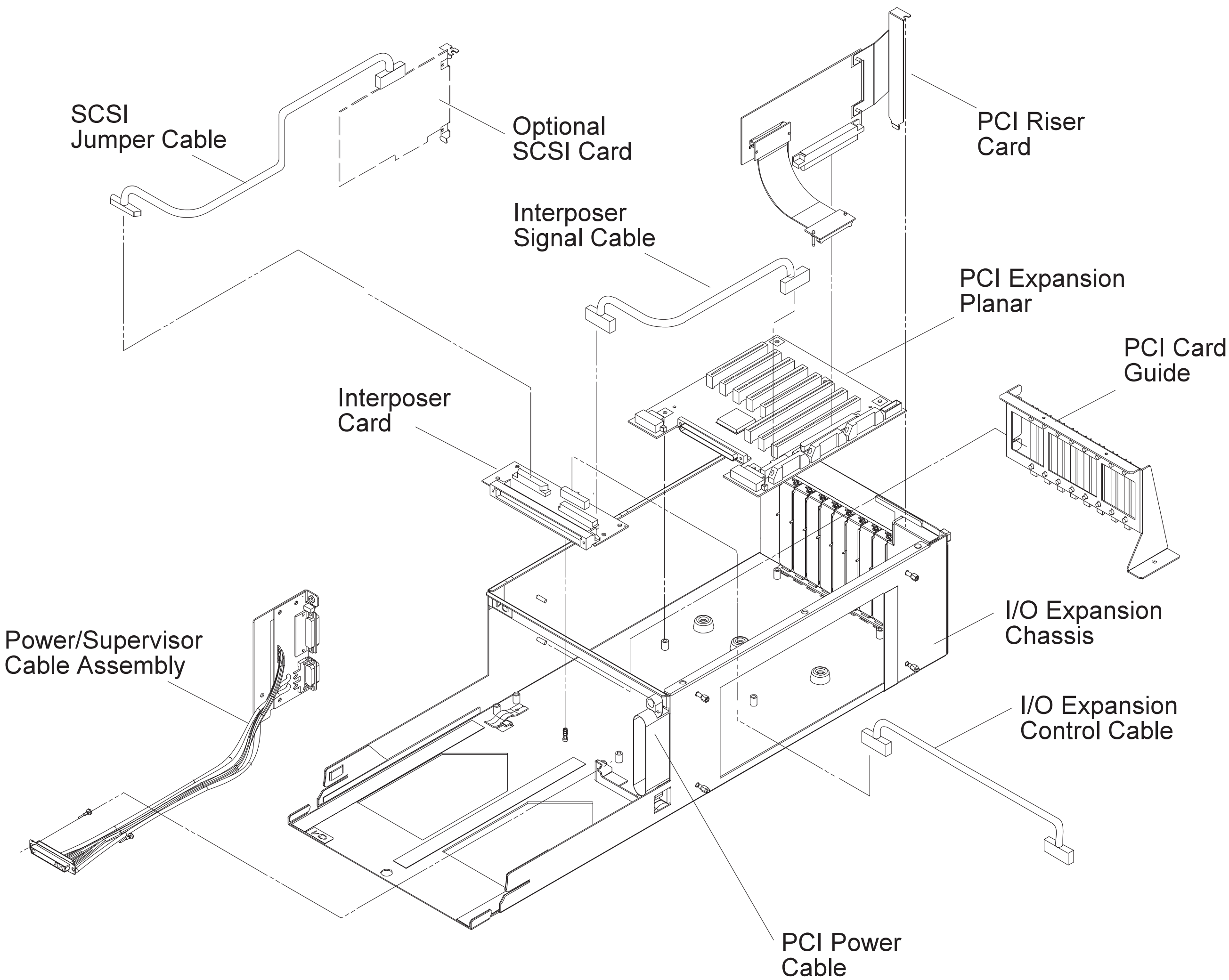


Figure 4-9. 332 MHz SMP Node I/O expansion assembly components

Removing the PCI riser card assembly

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP Wide Node using the steps in “Removing a 332 MHz SMP Wide Node” on page 4-6.
3. Remove the I/O expansion assembly cover by loosening the screws on top of the I/O expansion assembly.
4. Remove the Thin Node cover by loosening the screws on top of the thin node.
5. Remove the PCI riser cable from connector J6 on the Thin Node I/O planar.
6. Loosen the screw at the top of the rear card guide and remove the PCI riser card from the PCI expansion planar slot J9.
7. Return to the procedure that directed you here.

Replacing the PCI riser card assembly

1. Ensure ESD antistatic wrist device is attached.
2. Install the PCI riser card in PCI expansion planar slot J9 and tighten the screw at the top of the rear card guide.
3. Connect the PCI riser cable to connector J6 on the Thin Node I/O planar.
4. Reinstall the Thin Node cover by tightening the screws on top of the thin node.
5. Reinstall the I/O expansion assembly cover by tightening the screws on top of the I/O expansion assembly.
6. Replace the 332 MHz SMP Wide Node using the steps in "Replacing a 332 MHz SMP Wide Node" on page 4-7.
7. Return to the procedure that directed you here.

Removing the optional SCSI cable

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP Wide Node using the steps in "Removing a 332 MHz SMP Wide Node" on page 4-6.
3. Remove the I/O expansion assembly cover by loosening the screws on top of the assembly.
4. Disconnect the SCSI cable from the top of the SCSI card.
5. Disconnect the SCSI cable from connector J2 on the interposer card.

Replacing the optional SCSI cable

1. Ensure ESD antistatic wrist device is attached.
2. Connect the SCSI cable to connector J2 on the interposer card.
3. Connect the SCSI cable to the top of the SCSI card.
4. Reinstall the I/O expansion assembly cover by tightening the screws on the top of the assembly.
5. Reinstall the 332 MHz SMP Wide Node using the steps in "Replacing a 332 MHz SMP Wide Node" on page 4-7.
6. Return to the procedure that directed you here.

Removing the optional SCSI card

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP Wide Node using the steps in "Removing a 332 MHz SMP Wide Node" on page 4-6.
3. Remove the I/O expansion assembly cover by loosening the screws on top of the assembly.
4. Disconnect the SCSI cable from the top of the SCSI card.
5. Record the position of the SCSI card, then remove the card.

Replacing the optional SCSI card

1. Ensure ESD antistatic wrist device is attached.
2. Install the SCSI card in the position recorded in the removal procedure.
3. Connect the SCSI cable to the top of the SCSI card.
4. Reinstall the I/O expansion assembly cover by tightening the screws on the top of the assembly.
5. Reinstall the 332 MHz SMP Wide Node using the steps in "Replacing a 332 MHz SMP Wide Node" on page 4-7.
6. Return to the procedure that directed you here.

Removing the interposer signal cable

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP Wide Node using the steps in “Removing a 332 MHz SMP Wide Node” on page 4-6.
3. Remove the I/O expansion assembly cover by loosening the screws on top of the assembly.
4. Disconnect the interposer signal cable at J1 on the interposer card.
5. Disconnect the interposer signal cable at J14 on the PCI expansion planar.

Replacing the interposer signal cable

1. Ensure ESD antistatic wrist device is attached.
2. Connect the interposer signal cable at J14 on the PCI expansion planar.
3. Connect the interposer signal cable at J1 on the interposer card.
4. Reinstall the I/O expansion assembly cover by tightening the screws on the top of the assembly.
5. Reinstall the 332 MHz SMP Wide Node using the steps in “Replacing a 332 MHz SMP Wide Node” on page 4-7.
6. Return to the procedure that directed you here.

Removing the interposer card

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP Wide Node using the steps in “Removing a 332 MHz SMP Wide Node” on page 4-6.
3. Remove the I/O expansion assembly cover by loosening the screws on top of the assembly.
4. Disconnect the interposer signal cable at J1 on the interposer card.
5. Disconnect the I/O expansion control cable at J4 on the interposer card.
6. If applicable, disconnect the SCSI cable from connector J2 on the interposer card.
7. Remove the screws securing the interposer card. Retain the screws for later installation.
8. Remove the interposer card.

Replacing the interposer card

1. Ensure ESD antistatic wrist device is attached.
2. Install the interposer card with the screws that were previously removed.
3. If applicable, connect the SCSI cable to connector J2 on the interposer card.
4. Connect the I/O expansion control cable at J4 on the interposer card.
5. Connect the interposer signal cable at J1 on the interposer card.
6. Reinstall the I/O expansion assembly cover by tightening the screws on the top of the assembly.
7. Reinstall the 332 MHz SMP Wide Node using the steps in “Replacing a 332 MHz SMP Wide Node” on page 4-7.
8. Return to the procedure that directed you here.

Removing the power/supervisor cable assembly

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP node using the steps in “Removing a 332 MHz SMP Thin Node” on page 4-5 or “Removing a 332 MHz SMP Wide Node” on page 4-6.
3. Refer to “Removing the Thin Node system planar” on page 4-17 to remove the 332 MHz SMP Thin Node system planar.
4. Remove the screws holding the power/supervisor cable assembly to the rear of the chassis. Retain the screws for later installation.
5. Remove the screws holding the power/supervisor cable assembly to the cable assembly support bracket. Retain the screws for later installation.

6. Remove the screws holding the power/supervisor cable assembly to the front of the chassis. Retain the screws for later installation.

Replacing the power/supervisor cable assembly

1. Ensure ESD antistatic wrist device is attached.
2. Tighten the screws holding the power/supervisor cable assembly to the front of the chassis using the screws retained from the removal procedure.
3. Tighten the screws holding the power/supervisor cable assembly to the assembly support bracket using the screws retained from the removal procedure.
4. Tighten the screws holding the power/supervisor assembly to the rear of the chassis using the screws retained from the removal procedure.
5. Refer to “Replacing the Thin Node system planar” on page 4-18 to replace the 332 MHz SMP Thin Node system planar.
6. Reinstall the 332 MHz SMP node using the steps in “Replacing a 332 MHz SMP Thin Node” on page 4-5 or “Replacing a 332 MHz SMP Wide Node” on page 4-7.
7. Return to the procedure that directed you here.

Removing the power cable assembly

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP Wide Node using the steps in “Removing a 332 MHz SMP Wide Node” on page 4-6.
3. Remove the I/O expansion planar using the steps in “Removing the I/O expansion planar” on page 4-23.
4. Remove the screws holding the power cable assembly to the rear of the chassis. Retain the screws for later installation.
5. Remove the screws holding the power cable assembly to the cable assembly support bracket. Retain the screws for later installation.
6. Remove the screws holding the power cable assembly to the front of the chassis. Retain the screws for later installation.

Replacing the power cable assembly

1. Ensure ESD antistatic wrist device is attached.
2. Tighten the screws holding the power cable assembly to the front of the chassis using the screws retained from the removal procedure.
3. Tighten the screws holding the power cable assembly to the assembly support bracket using the screws retained from the removal procedure.
4. Tighten the screws holding the power assembly to the rear of the chassis using the screws retained from the removal procedure.
5. Reinstall the I/O expansion planar using the steps in “Replacing the I/O expansion planar” on page 4-23.
6. Reinstall the 332 MHz SMP Wide Node using the steps in “Replacing a 332 MHz SMP Wide Node” on page 4-7.
7. Return to the procedure that directed you here.

Removing the I/O expansion planar

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP Wide Node using the steps in “Removing a 332 MHz SMP Wide Node” on page 4-6.
3. Remove the I/O expansion assembly cover by loosening the screws on top of the I/O expansion assembly.
4. Remove the PCI card(s) using the steps in “Removing the PCI adapter card” on page 4-11.
5. Remove the PCI riser card using the steps in “Removing the PCI riser card assembly” on page 4-19.
6. Remove the PCI card guide rail.
7. Remove the remaining plugs from the I/O planar (J11, J12, J13, and J14).
8. Remove the 5 screws securing the I/O planar.
9. Remove the I/O planar from the chassis.

Replacing the I/O expansion planar

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 3-14 or *IBM Parallel System Support Programs for AIX: Installation Guide* for this procedure.

Note: Inform the customer that the MAC address will need to be updated, see “Updating the Ethernet hardware address” on page 3-6 for this procedure.

1. Ensure ESD antistatic wrist device is attached.
2. Reinstall the I/O planar in the chassis.
3. Reinstall the 5 screws to secure the I/O planar.
4. Reinstall the cables into the I/O planar (J11, J12, J13, and J14).
5. Install the PCI card guide rail.
6. Replace the PCI riser card using the steps in “Replacing the PCI riser card assembly” on page 4-20.
7. Replace the PCI card(s) using the steps in “Replacing the PCI adapter card” on page 4-12.
8. Reinstall the I/O expansion assembly cover by tightening the screws on top of the I/O expansion assembly.
9. Replace the 332 MHz SMP Wide Node using the steps in “Replacing a 332 MHz SMP Wide Node” on page 4-7.
10. Return to the procedure that directed you here.

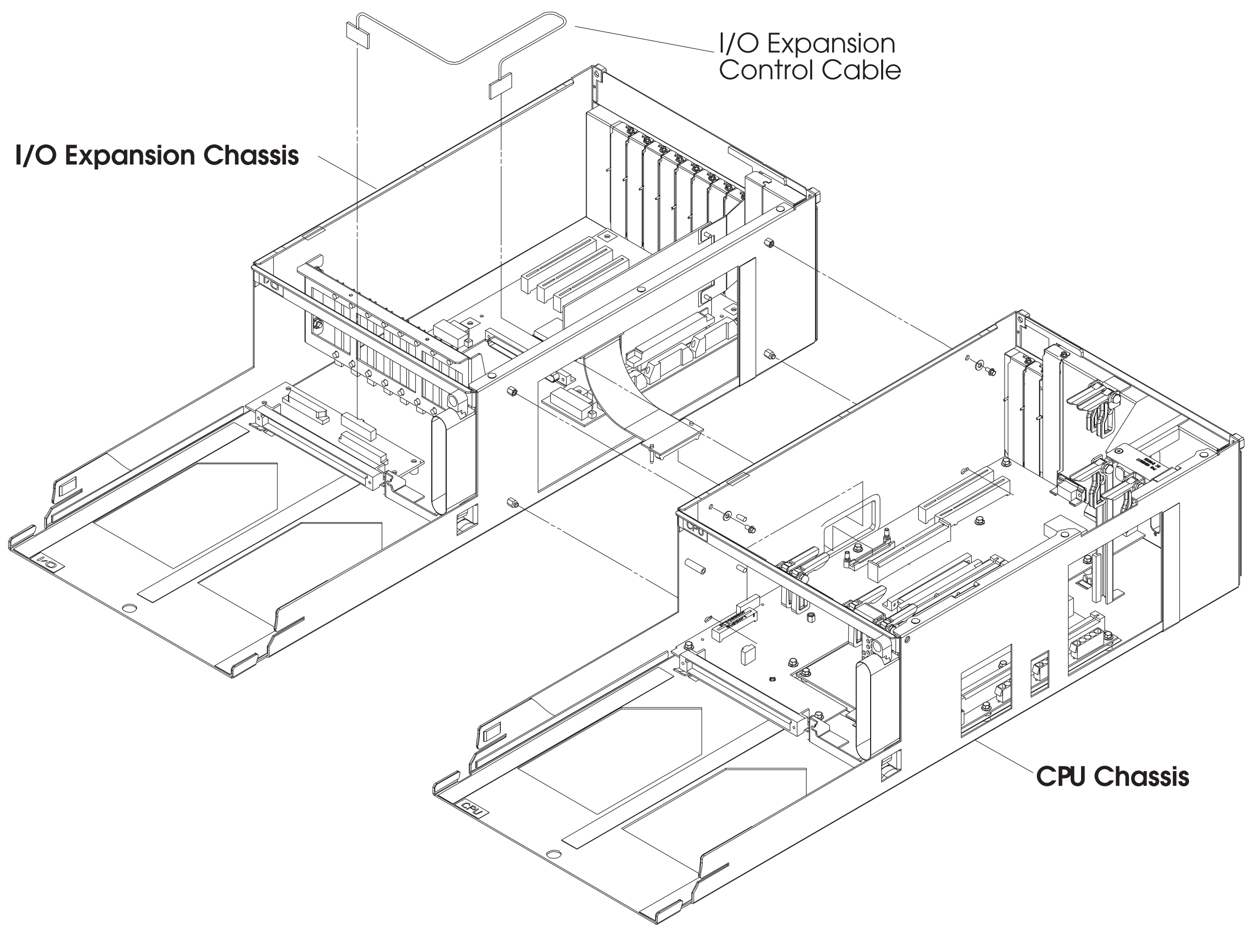


Figure 4-10. 332 MHz SMP Node I/O expansion control cable

Removing the I/O expansion control cable

1. Ensure ESD antistatic wrist device is attached.
2. Remove the 332 MHz SMP Wide Node using the steps in "Removing a 332 MHz SMP Wide Node" on page 4-6.
3. Remove the covers of the I/O expansion assembly and the Thin Node by loosening the screws on top of the assemblies.
4. Disconnect the expansion control cable at J4 on the interposer card in the I/O expansion assembly.
5. Disconnect the expansion control cable at J2 on the I/O planar in the Thin Node.
6. If necessary, cut the cable tie that secures the cable to the tie-down on the bottom of the chassis.

Replacing the I/O expansion control cable

1. Ensure ESD antistatic wrist device is attached.
2. Connect the expansion control cable at J2 on the I/O planar in the thin node.
3. Connect the expansion control cable at J4 on the interposer card in the I/O expansion assembly.
4. Reinstall the covers on the I/O expansion assembly and the Thin Node by tightening the screws on the top of the assemblies.
5. Reinstall the 332 MHz SMP Wide Node using the steps in "Replacing a 332 MHz SMP Wide Node" on page 4-7.
6. Return to the procedure that directed you here.

Service procedures for POWER3 SMP Thin and Wide Nodes

These procedures cover the removal and replacement of the 200 MHz POWER3 SMP and 375 MHz POWER3 SMP Thin and Wide Node components.

Note: A 5.5 mm socket is required to perform some of the following service procedures.

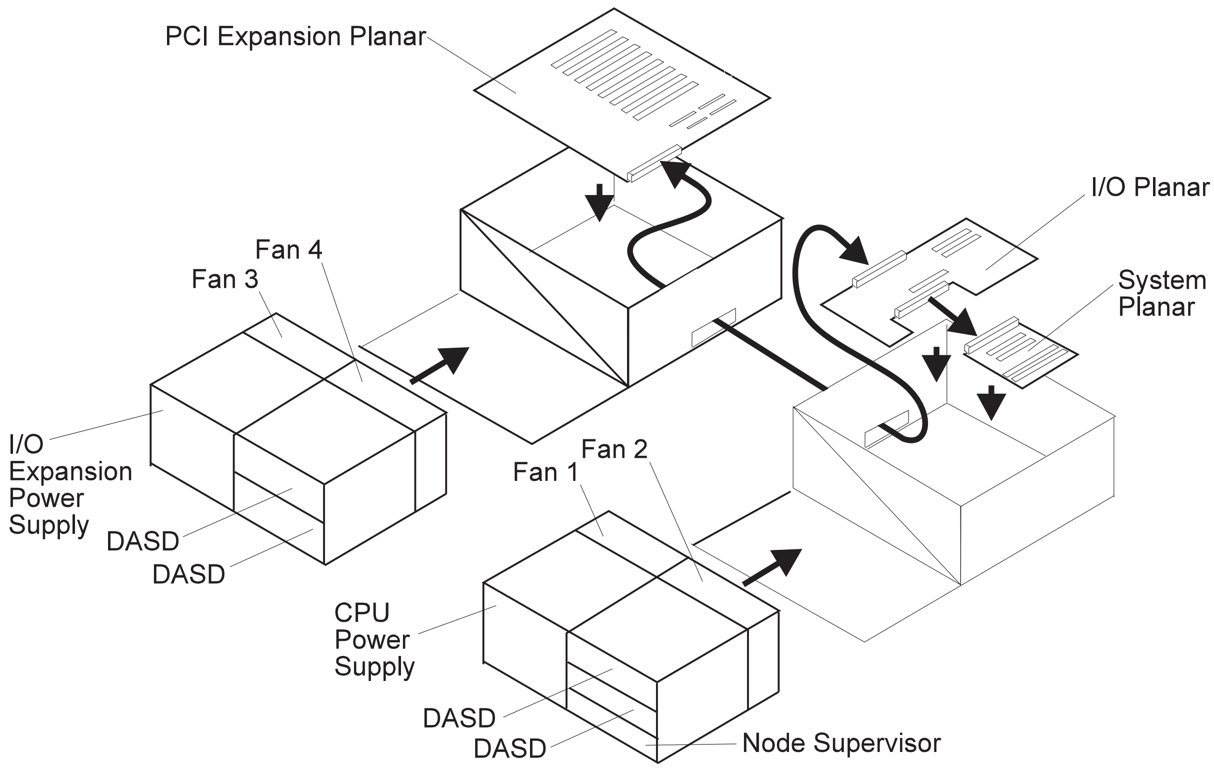


Figure 4-11. POWER3 SMP Thin and Wide Node high level component diagram

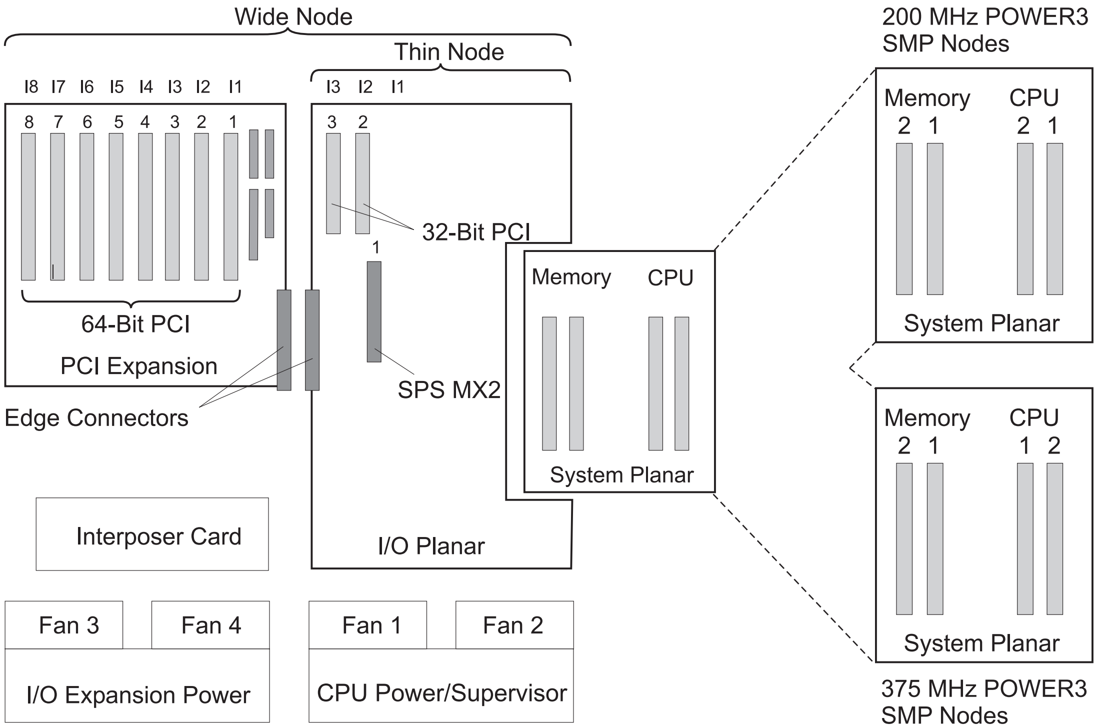


Figure 4-12. POWER3 SMP Thin and Wide Node (top view)

Removing a POWER3 SMP Thin Node

1. If necessary, fence the node from the system.
2. Ensure that the Thin Node is offline (shutdown) and powered off from the control workstation.
3. Ensure the Thin Node power supply switch is in the Off (‘0’) position.
4. Ensure the 48-volt input cable switch is in the Off (‘0’) position.
5. Remove all attached cables from the rear of the Thin Node.
6. After removing the 48-volt input cable, place a protective cover (part number 48G3055) over the plug end. The cover is supplied with the ship group.
7. Remove the CPU power assembly using the steps in “Removing the CPU and I/O expansion power assemblies” on page 4-28.
8. Remove the hold-down screws located at the rear of the Thin Node.
9. Remove the Thin Node from the front of the frame.
10. Return to the procedure that directed you here.

Replacing a POWER3 SMP Thin Node

1. Reinstall the Thin Node in the front of the frame.
2. Reinstall the hold-down screws located at the rear of the Thin Node.
3. Reinstall the CPU power assembly using the steps in “Replacing the CPU and I/O expansion power assemblies” on page 4-28.
4. Remove the protective cover (part number 48G3055) from the 48-volt input cable in J8. Ensure the alignment arrow is pointing to the bottom of the connector. Store the protective cover with the ship group tools.
5. Reattach all cables that were removed from the rear of the Thin Node.
6. Ensure the 48-volt input cable switch is in the On (‘1’) position.
7. Ensure the Thin Node power supply switch is in the On (‘1’) position.
8. If necessary, unfence the node.
9. Return to the procedure that directed you here.

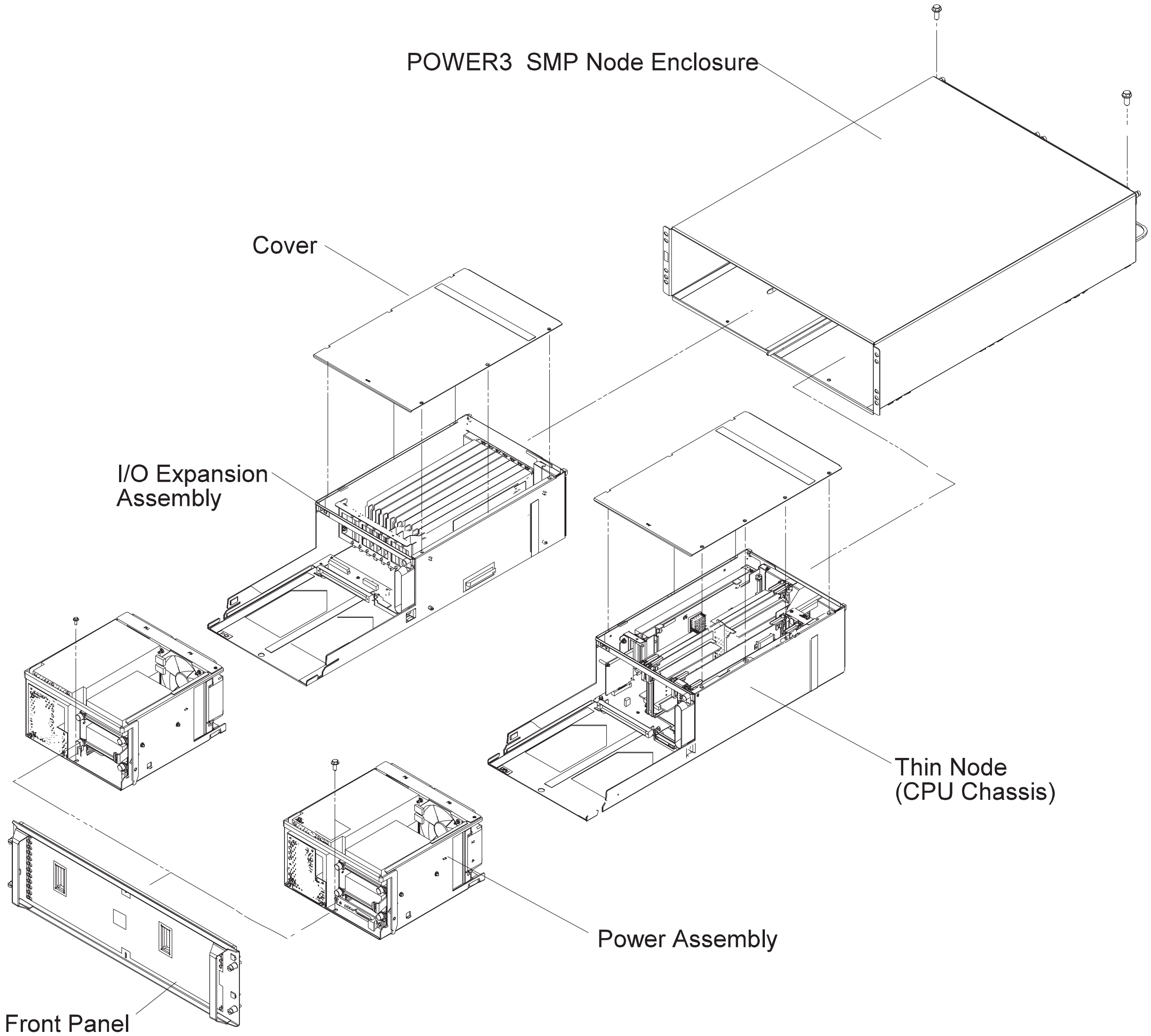


Figure 4-13. POWER3 SMP Thin and Wide Nodes

Removing a POWER3 SMP Wide Node

1. If necessary, fence the node from the system.
2. Ensure that the node is offline (shutdown) and powered off from the control workstation.
3. Ensure the Wide Node power supply switches are in the Off (‘0’) position.
4. Ensure the 48-volt input cable switches are in the Off (‘0’) position.
5. Remove all attached cables from the rear of the node.
6. After removing the 48-volt input cables, place protective covers (part number 48G3055) over the plug ends. The covers are supplied with the ship group.
7. Remove the CPU power assembly and the I/O expansion power assembly using the steps in “Removing the CPU and I/O expansion power assemblies” on page 4-28.
8. Remove the hold-down screws located at the rear of the node.
9. Remove the Wide Node from the front of the frame.
10. Return to the procedure that directed you here.

Replacing a POWER3 SMP Wide Node

1. Reinstall the Wide Node in the front of the frame.
2. Reinstall the hold-down screws located at the rear of the node.
3. Reinstall the CPU power assembly and the I/O expansion power assembly using the steps in "Replacing the CPU and I/O expansion power assemblies" on page 4-28.
4. Remove the protective covers (part number 48G3055) from the 48-volt input cables. Store the protective covers with the ship group tools.
5. Connect the cable to both J8 connectors. Ensure the alignment arrows are pointing to the bottom of the connectors.
6. Reattach all of the cables that were removed from the rear of the node.
7. Ensure the 48-volt input cable switches are in the On ('1') position.
8. Ensure the Wide Node power supply switches are in the On ('1') position.
9. If necessary, unfence the node.
10. Return to the procedure that directed you here.

Removing the CPU and I/O expansion power assemblies

1. Ensure that the processor node is offline (shutdown) and powered off from the control workstation.
2. Ensure the node power supply circuit breakers in the Off ('0') position.
3. Ensure the 48-volt input cable in-line circuit breakers are in the Off ('0') position.
4. Remove the front cover panel by removing the screws. Retain the screws for later installation.
5. If necessary, unplug the 4-drop DASD cable from the I/O expansion assembly.
6. Remove the retaining screw at the front of the power assembly and retain for later use.
7. Pull forward and down on the power interlock bar to unlatch and remove the power assembly.
8. If you are replacing the power assembly with a new assembly, continue with 9. Otherwise, return to the procedure that directed you here.
9. Remove the supervisor card using the steps in "Removing the node supervisor card" on page 4-31.
10. Record the current DASD locations, then remove the DASD using the steps in "Removing the DASD" on page 4-31.
11. Return to the procedure that directed you here.

Replacing the CPU and I/O expansion power assemblies

1. If you are replacing the power assembly with a new assembly, continue with 2, otherwise go to 4.
2. Install the supervisor card, removed from the old power assembly, using the steps in "Replacing the node supervisor card" on page 4-31.
3. Install the DASD (removed from the old power assembly) in the locations recorded in the removal procedure, using the steps in "Replacing the DASD" on page 4-32.
4. Install and latch the power assemblies by lifting and pushing forward on the power interlock bar.
5. Ensure the power interlock tab is engaged by pushing in on the tab.
6. Secure the front of the power assemblies with the retaining screw that was previously removed.
7. If necessary, plug the 4-drop DASD cable in the I/O expansion assembly.
8. Install the front cover panel using the screws that were previously removed.
9. Push up and back on the power interlock bar until the power assembly is engaged and locked.
10. Push the power interlock tab marked 'PUSH' at the right side front of the power assembly to engage the power connections.
11. Ensure the 48-volt input cable in-line circuit breakers are in the On ('1') position.
12. Ensure the node power supply circuit breakers are in the On ('1') position.
13. Return to the procedure that directed you here.

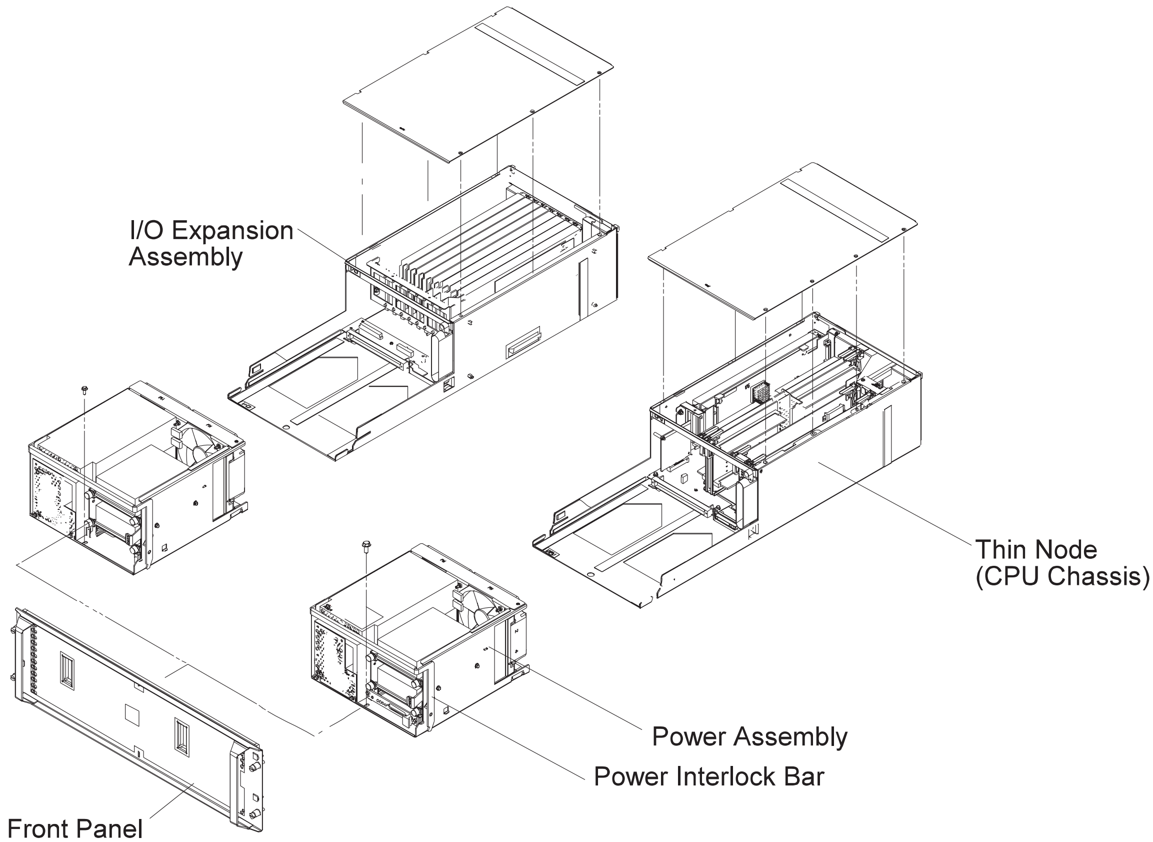


Figure 4-14. POWER3 SMP Thin and Wide Node power assemblies

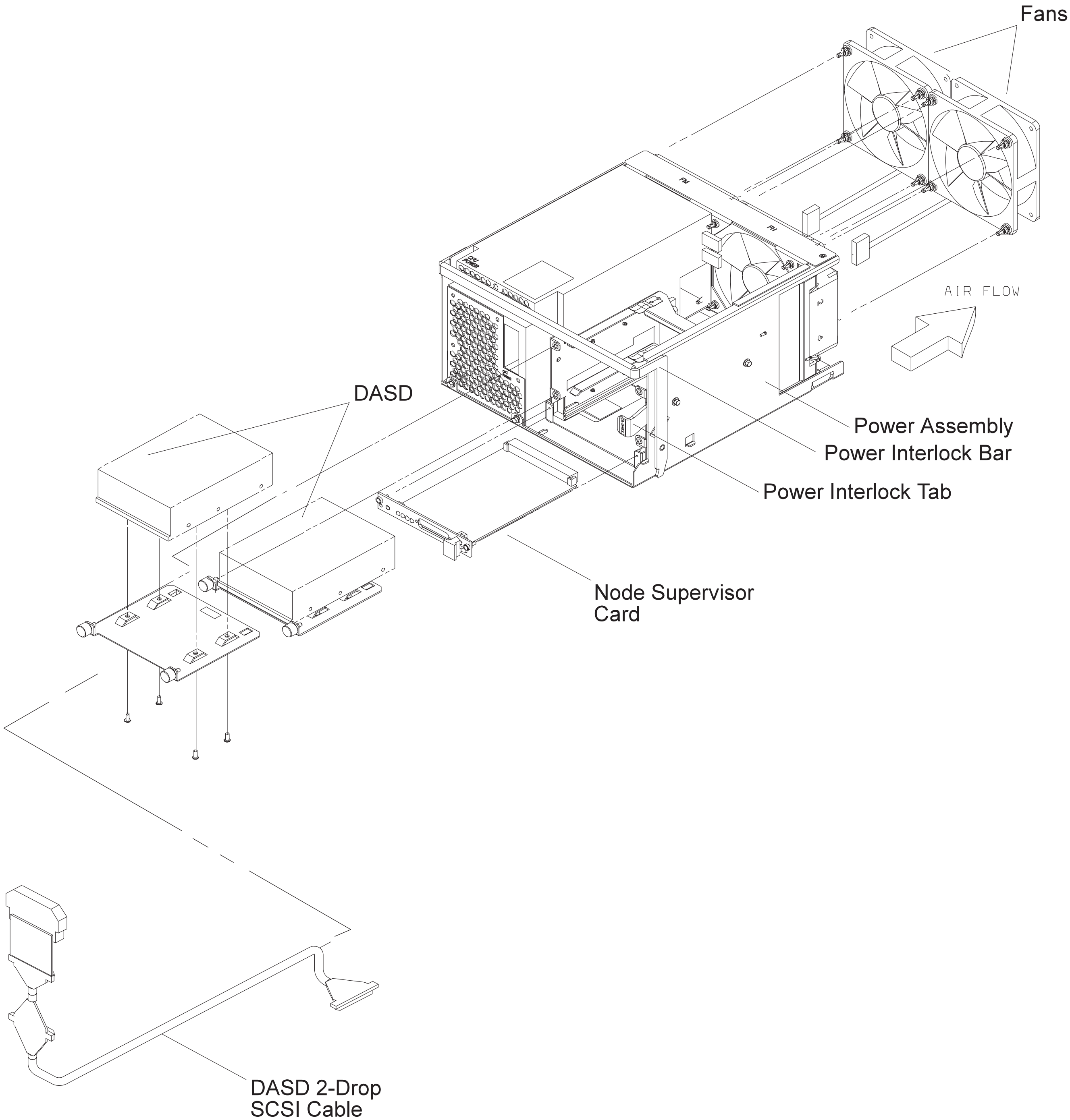


Figure 4-15. POWER3 SMP Thin and Wide Node power assembly components

Removing the fan(s)

1. Ensure ESD antistatic wrist device is attached.
2. Remove the power assembly using the steps in "Removing the CPU and I/O expansion power assemblies" on page 4-28.
3. Remove the screw from the top of the fan bracket.
4. Loosen the screw on the side of the fan bracket.
5. Lift the fan bracket from the power assembly.
6. Locate and disconnect the fan plug.
7. Remove the shock mounts from the bracket and retain for later installation.

Replacing the fan(s)

1. Install the shock mounts, removed from the old fan, to the replacement fan.
2. Install the fan with the wires to the bottom and the airflow indicator pointing to the rear of the chassis.
3. Connect the fan plug.
4. Reinstall the fan bracket.
5. Install 1 screw on the top and 1 screw on the side of the fan bracket.
6. Check that no cable touches the fan.
7. Reinstall the power assembly using the steps in "Replacing the CPU and I/O expansion power assemblies" on page 4-28.
8. Return to the procedure that directed you here.

Removing the node supervisor card

1. Ensure ESD antistatic wrist device is attached.
2. Remove the front cover panel by removing the screws. Retain the screws for later installation.
3. Remove the screws holding the node supervisor card to the mounting bracket. Retain the screws for later installation.
4. Remove the 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 3-14 or *IBM Parallel System Support Programs for AIX: Installation Guide* for this procedure.

1. Ensure ESD antistatic wrist device is attached.
2. Firmly seat the node supervisor card in the mounting bracket and secure with the screws that were previously removed.
3. Install the front cover panel using the screws that were previously removed.
4. Perform "Updating the node supervisor code" on page 3-13.
5. Return to the procedure that directed you here.

Removing the DASD

1. Ensure ESD antistatic wrist device is attached.
2. Remove the front cover panel by removing the screws. Retain the screws for later installation.
3. Disconnect the SCSI cable and the power cable.
4. Record the DASD location.
5. Remove the screws that secure the DASD tray to the power assembly. Retain the screws for later installation.
6. Slide the DASD assembly from the front of the power assembly.
7. Remove the screws that secure the DASD to the DASD tray. Retain the screws for later installation.
8. Remove the DASD from the DASD tray.
9. Check the jumper position(s) on the DASD, if any. Record the settings for the replacement DASD.

   Note: Ensure the grounding strips located around the edges are firmly in place.

Replacing the DASD

1. Ensure ESD antistatic wrist device is attached.
2. Set the jumper position(s) on the new DASD, if any, using the settings you recorded in the removal procedure.
3. Ensure all required DASD jumpers are installed. Refer to *Adapters, Devices, and Cable Information for Multiple Bus Systems*, SA38-0516, for the required jumper information.
4. Install the DASD in the DASD tray using the screws that were previously removed.
5. Reinstall the DASD assembly into the front of the power assembly and secure with the screws that were previously removed.
6. Connect the SCSI cable and power cable to the DASD.
7. Install the front cover panel using the screws that were previously removed.
8. Return to the procedure that directed you here.

Removing the SPS MX2 adapter card

1. Ensure ESD antistatic wrist device is attached.
2. Remove the POWER3 SMP Thin node using the steps in "Removing a POWER3 SMP Thin Node" on page 4-26 or "Removing a POWER3 SMP Wide Node" on page 4-27.
3. Turn the CPU assembly cover locking screws and remove the cover.
4. Loosen the screw at the top of the rear card guide and remove the SPS MX2 adapter card from the Thin Node system planar slot J9.
5. Remove the protective cover from port P1 and retain for later use.

Replacing the SPS MX2 adapter card

1. Ensure ESD antistatic wrist device is attached.
2. Install the protective cover, that was previously removed, on port P1, if necessary.
3. Install the SPS MX2 adapter card in the Thin Node system planar slot J9 and tighten the screw at the top of the rear card guide.
4. Replace the CPU assembly cover. Turn the locking screws to secure the cover.
5. Reinstall the POWER3 SMP Thin node using the steps in "Replacing a POWER3 SMP Thin Node" on page 4-26 or "Replacing a POWER3 SMP Wide Node" on page 4-28.
6. Return to the procedure that directed you here.

Removing the PCI adapter card

1. Ensure ESD antistatic wrist device is attached.
2. Remove the POWER3 SMP node using the steps in "Removing a POWER3 SMP Thin Node" on page 4-26 or "Removing a POWER3 SMP Wide Node" on page 4-27.
3. Turn the CPU assembly or I/O expansion assembly cover locking screws and remove the cover.
4. Loosen the knurled knob, for this adapter, at the rear of the assembly.
5. Check for (and record) internal connections to other adapter cards or cables before removing them.
6. If the adapter card has a card extender, holding the front end of the adapter, release the extender by pressing the locking tab to the side.
7. Place plastic inserts, from the ship group, on either side of the card to be removed.
8. Grasp the adapter by the pull tabs and pull it out of the slot.

Replacing the PCI adapter card

1. Ensure ESD antistatic wrist device is attached.
2. Check for any jumpers or switches to be set on this card, then set as appropriate.
3. If the adapter card requires a card extender, attach the extender to the front end of the adapter and lock in place with locking tab.
4. Align the adapter in the slot, then push the card into the slot.
5. Remove the plastic inserts, previously used for card removal, and return them to the ship group.
6. Tighten the knurled knob, for this adapter, at the rear of the assembly.
7. If this card has any internal connections to other adapter(s) or cables, connect them, as appropriate.
8. Replace the CPU assembly or I/O expansion assembly cover. Turn the locking screws to secure the cover.
9. Reinstall the POWER3 SMP node using the steps in “Replacing a POWER3 SMP Thin Node” on page 4-26 or “Replacing a POWER3 SMP Wide Node” on page 4-28.
10. Return to the procedure that directed you here.

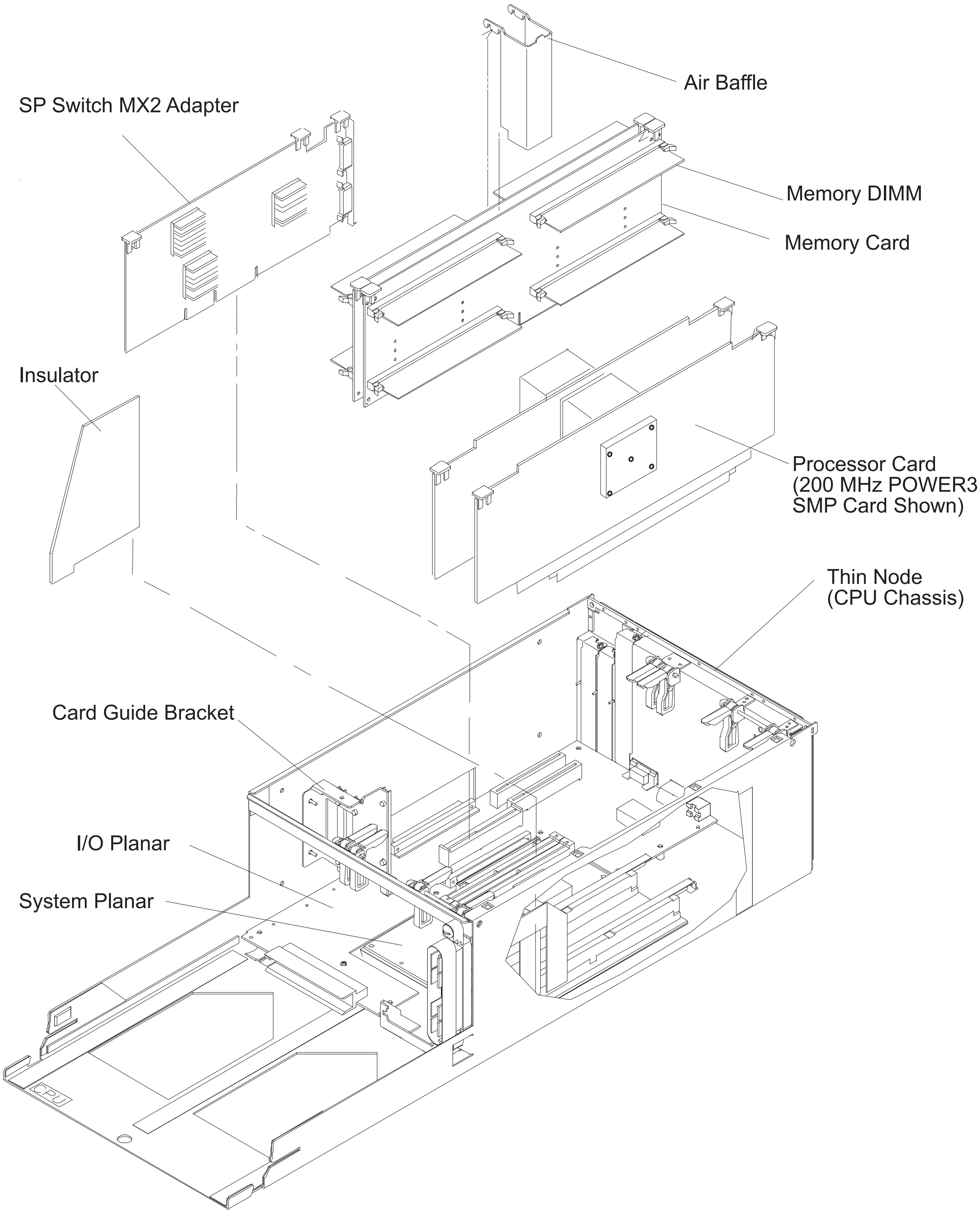


Figure 4-16. POWER3 SMP Thin Node components (1 of 2)

Removing the memory card

1. Ensure ESD antistatic wrist device is attached.
2. Remove the POWER3 SMP node using the steps in “Removing a POWER3 SMP Thin Node” on page 4-26 or “Removing a POWER3 SMP Wide Node” on page 4-27.
3. Turn the CPU assembly cover locking screws and remove the cover.

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

4. Pull up on the thumb locks to disengage the memory card.
5. Remove the memory card.

Replacing the memory card

1. Ensure ESD antistatic wrist device is attached.

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

2. Align the memory card with the slot.
3. Push down on the thumb locks to engage the memory card.
4. Replace the CPU assembly cover. Turn the locking screws to secure the cover.
5. Reinstall the POWER3 SMP node using the steps in “Replacing a POWER3 SMP Thin Node” on page 4-26 or “Replacing a POWER3 SMP Wide Node” on page 4-28.
6. Return to the procedure that directed you here.

Removing the CPU card

1. Ensure ESD antistatic wrist device is attached.
2. Remove the POWER3 SMP node using the steps in “Removing a POWER3 SMP Thin Node” on page 4-26 or “Removing a POWER3 SMP Wide Node” on page 4-27.
3. Turn the CPU assembly cover locking screws and remove the cover.

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

4. Pull up on the thumb locks to disengage the CPU card.

Attention: *Do not* grasp the card by the heat sink when plugging or unplugging. This will damage the processor chip.

5. Remove the CPU card.

Replacing the CPU card

1. Ensure ESD antistatic wrist device is attached.

Attention: *Do not* grasp the card by the heat sink when plugging or unplugging. This will damage the processor chip.

2. Align the CPU card with the slot.

Attention: Do **not** rock cards from side-to-side when plugging or unplugging.

3. Push down on the thumb locks to engage the CPU card.
4. Replace the CPU assembly cover. Turn the locking screws to secure the cover.
5. Reinstall the POWER3 SMP node using the steps in "Replacing a POWER3 SMP Thin Node" on page 4-26 or "Replacing a POWER3 SMP Wide Node" on page 4-28.
6. Return to the procedure that directed you here.

Removing the POWER3 SMP Thin 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 2-20 on page 2-15). 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.

1. Ensure ESD antistatic wrist device is attached.
2. Remove the POWER3 SMP node. Refer to "Removing a POWER3 SMP Thin Node" on page 4-26 or "Removing a POWER3 SMP Wide Node" on page 4-27.
3. Turn the processor node cover locking screws and remove the cover.
4. Remove the PCI card(s) using the steps in "Removing the PCI adapter card" on page 4-32.
5. Remove the SPS MX2 adapter card, if present, using the steps in "Removing the SPS MX2 adapter card" on page 4-32.
6. Remove the memory card(s) using the steps in "Removing the memory card" on page 4-35.
7. Remove the CPU card(s) using the steps in "Removing the CPU card" on page 4-35.
8. Remove the PCI card guide bracket.
9. **If this is a Wide Node:** Unplug the I/O expansion control cable from J2 on the I/O planar using the steps in "Removing the I/O expansion control cable" on page 4-44.
10. **If this is a Wide Node:** Separate the CPU assembly from the I/O expansion assembly after removing the screws connecting them.
11. Remove the screws holding the system planar and separate the system planar from the I/O planar.
12. Remove the Ethernet BNC nut and washer.
13. Remove the screws holding the I/O planar.
14. Unseat the I/O planar from the locator pin.

Attention: Components on the underside of the I/O planar can be damaged by the chassis standoffs. Keep the planar elevated, at an angle, when servicing the planar.

15. Separate the I/O planar and the system planar.
16. Slide the I/O planar out from the chassis through the power side.

Replacing the POWER3 SMP Thin 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 2-20 on page 2-15). 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 Thin 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 3-14 or *IBM Parallel System Support Programs for AIX: Installation Guide* for this procedure.

Note: Inform the customer that the MAC address will need to be updated, see "Updating the Ethernet hardware address" on page 3-6 for this procedure.

1. Ensure ESD antistatic wrist device is attached.
2. Slide the I/O planar into the chassis.

Attention: Install the I/O planar at an angle. Insert the BNC connector through the back wall first. Then set the planar in position with the holes aligned with the standoffs. **Setting the planar flat on the standoffs, then sliding it to the rear to access the BNC will damage the components on the underside of the planar.**

3. Attach the I/O planar to the system planar.
4. Seat the I/O planar at the locator pin.
5. Reinstall the screws to secure the I/O planar.
6. Reinstall the Ethernet BNC nut and washer.
7. Connect the system planar to the I/O planar and reinstall the screws to secure the system planar.
8. **If this is a Wide Node:** Connect the CPU assembly to the I/O expansion assembly and secure with screws.
9. **If this is a Wide Node:** Reinstall the I/O expansion control cable to J2 on the I/O planar using the steps in "Replacing the I/O expansion control cable" on page 4-44.
10. Install the PCI card guide bracket.
11. Replace the PCI card(s) using the steps in "Replacing the PCI adapter card" on page 4-33.
12. Reinstall the SPS MX2 adapter card, if present. using the steps in "Replacing the SPS MX2 adapter card" on page 4-32.
13. Replace the memory card(s) using the steps in "Replacing the memory card" on page 4-35.
14. Replace the CPU card(s) using the steps in "Replacing the CPU card" on page 4-35.
15. Replace the processor node cover and turn the locking screws to secure the cover.
16. Reinstall the POWER3 SMP node using the steps in "Replacing a POWER3 SMP Thin Node" on page 4-26 or "Replacing a POWER3 SMP Wide Node" on page 4-28.
17. If necessary, update the service processor firmware. See "Installing firmware updates on SP nodes" on page 3-15.
18. Return to the procedure that directed you here.

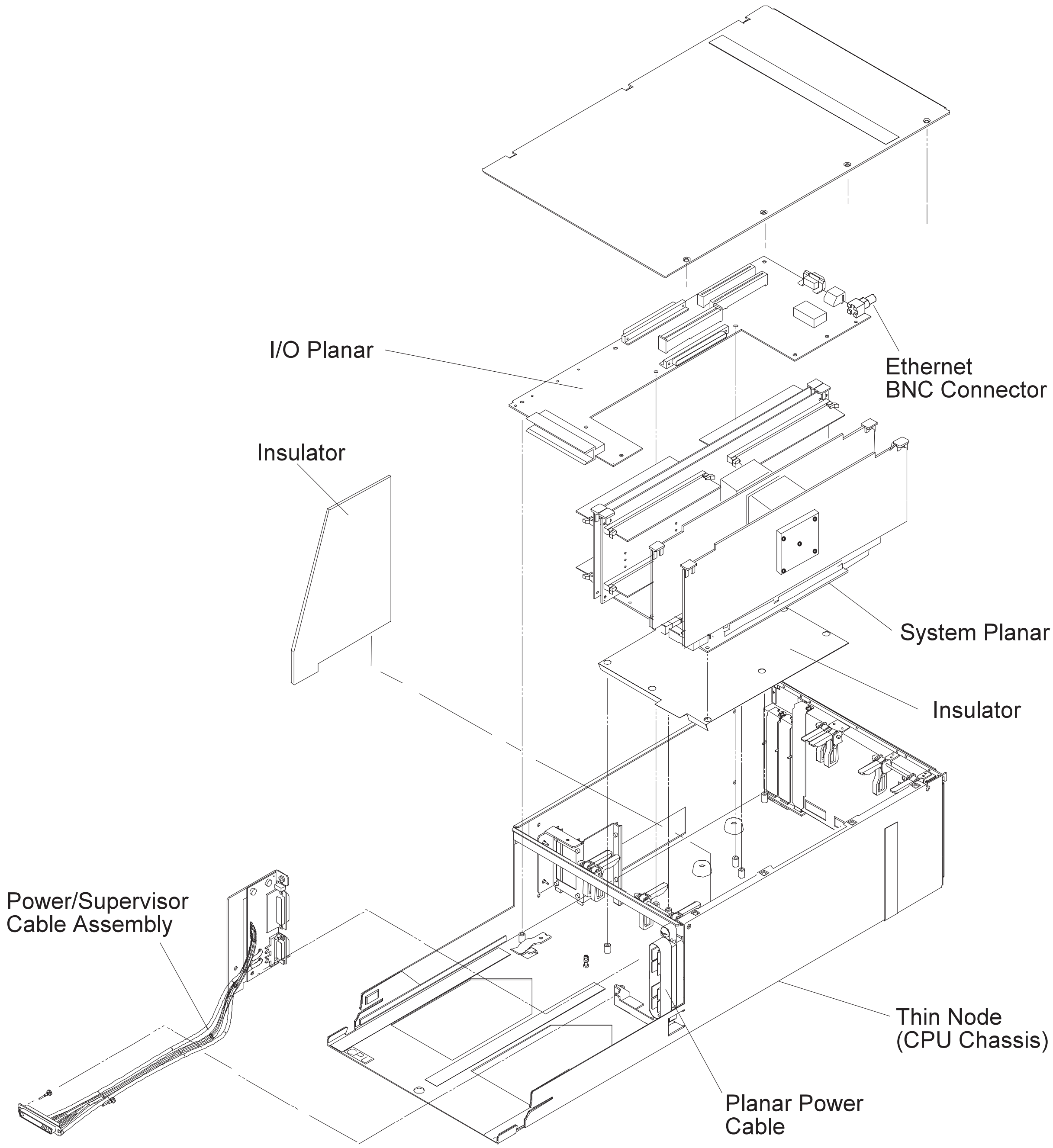


Figure 4-17. POWER3 SMP Thin Node components (2 of 2)

Removing the POWER3 SMP Thin Node system planar

1. Ensure ESD antistatic wrist device is attached.
2. Remove the POWER3 SMP node. Refer to "Removing a POWER3 SMP Thin Node" on page 4-26 or "Removing a POWER3 SMP Wide Node" on page 4-27.
3. Turn the processor node cover locking screws and remove the cover.
4. Remove the memory card(s) using the steps in "Removing the memory card" on page 4-35.
5. Remove the CPU card(s) using the steps in "Removing the CPU card" on page 4-35.
6. If installed, remove the metal card guide from the memory card position.
7. Remove the black plastic cable retainer.
8. Remove the 2 power plugs from the power supply end of the system planar.
9. Remove the screws securing the system planar.

10. Separate the I/O planar and the system planar.
11. Remove the system planar from the chassis.

    Note: Retain the insulation sheet covering the power cables for later installation.

Replacing the POWER3 SMP Thin Node system planar

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 3-14 or *IBM Parallel System Support Programs for AIX: Installation Guide* for this procedure.

Note: Inform the customer that the MAC address will need to be updated, see "Updating the Ethernet hardware address" on page 3-6 for this procedure.

1. Ensure ESD antistatic wrist device is attached.
2. Reinstall the system planar into the chassis.

   Note: Fan out the power cable to allow the planar to install properly. Also, make sure the insulation sheet is in place.

3. Attach the I/O planar to the system planar.
4. Reinstall the screws to secure the system planar.
5. Reinstall the 2 power plugs to the power supply end of the system planar.
6. Reinstall the plastic insulator.
7. If previously removed, reinstall the metal card guide to the memory card position.
8. Replace the memory card(s) using the steps in "Replacing the memory card" on page 4-35.
9. Replace the CPU card(s) using the steps in "Replacing the CPU card" on page 4-35.
10. Replace the processor node cover and turn the locking screws to secure the cover.
11. Reinstall the POWER3 SMP node using the steps in "Replacing a POWER3 SMP Thin Node" on page 4-26 or "Replacing a POWER3 SMP Wide Node" on page 4-28.
12. If necessary, update the service processor firmware. See "Installing firmware updates on SP nodes" on page 3-15.
13. Return to the procedure that directed you here.

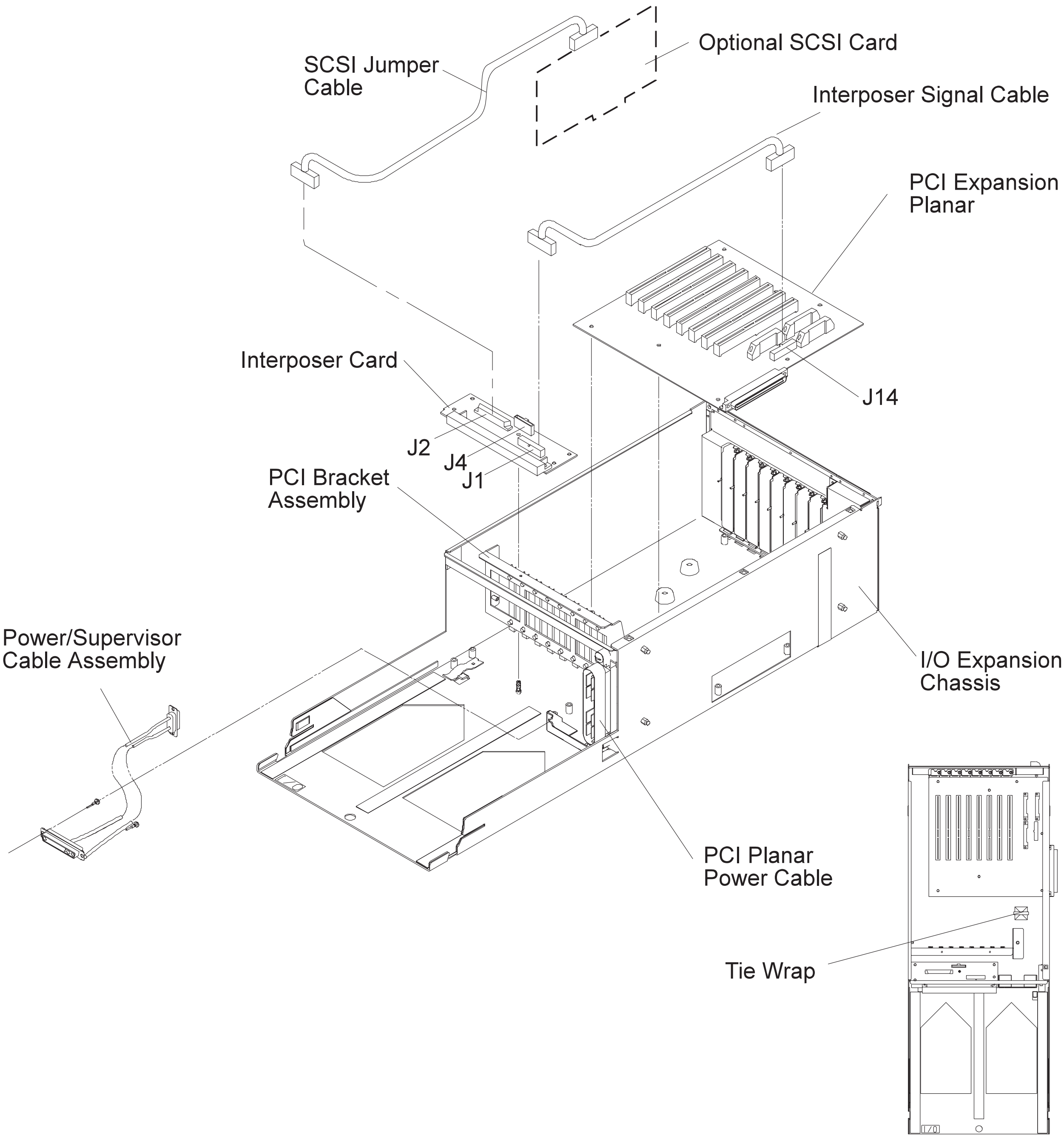


Figure 4-18. POWER3 SMP Wide Node I/O expansion assembly components

Removing the optional SCSI cable

1. Ensure ESD antistatic wrist device is attached.
2. Remove the POWER3 SMP Wide node using the steps in "Removing a POWER3 SMP Wide Node" on page 4-27.
3. Turn the I/O expansion assembly cover locking screws and remove the cover.
4. Disconnect the SCSI cable from the top of the SCSI card.
5. Disconnect the SCSI cable from connector J2 on the interposer card.

Replacing the optional SCSI cable

1. Ensure ESD antistatic wrist device is attached.
2. Connect the SCSI cable to connector J2 on the interposer card.
3. Connect the SCSI cable to the top of the SCSI card.
4. Replace the I/O expansion assembly cover. Turn the locking screws to secure the cover.
5. Reinstall the POWER3 SMP Wide node using the steps in "Replacing a POWER3 SMP Wide Node" on page 4-28.
6. Return to the procedure that directed you here.

Removing the optional SCSI card

1. Ensure ESD antistatic wrist device is attached.
2. Remove the POWER3 SMP Wide node using the steps in "Removing a POWER3 SMP Wide Node" on page 4-27.
3. Turn the I/O expansion assembly cover locking screws and remove the cover.
4. Disconnect the SCSI cable from the top of the SCSI card.
5. Record the position of the SCSI card, then remove the card.

Replacing the optional SCSI card

1. Ensure ESD antistatic wrist device is attached.
2. Install the SCSI card in the position recorded in the removal procedure.
3. Connect the SCSI cable to the top of the SCSI card.
4. Replace the I/O expansion assembly cover. Turn the locking screws to secure the cover.
5. Reinstall the POWER3 SMP Wide Node using the steps in "Replacing a POWER3 SMP Wide Node" on page 4-28.
6. Return to the procedure that directed you here.

Removing the interposer signal cable

1. Ensure ESD antistatic wrist device is attached.
2. Remove the POWER3 SMP Wide Node using the steps in "Removing a POWER3 SMP Wide Node" on page 4-27.
3. Turn the I/O expansion assembly cover locking screws and remove the cover.
4. Disconnect the interposer signal cable at J1 on the interposer card.
5. Disconnect the interposer signal cable at J14 on the PCI expansion planar.
6. If necessary, cut the cable tie that secures the cable to the tie-down on the bottom of the chassis.

Replacing the interposer signal cable

1. Ensure ESD antistatic wrist device is attached.
2. Connect the interposer signal cable at J14 on the PCI expansion planar.
3. Connect the interposer signal cable at J1 on the interposer card.
4. Secure the cable to the tie-down on the bottom of the chassis with a cable tie.
5. Replace the I/O expansion assembly cover. Turn the locking screws to secure the cover.
6. Reinstall the POWER3 SMP Wide Node using the steps in "Replacing a POWER3 SMP Wide Node" on page 4-28.
7. Return to the procedure that directed you here.

Removing the interposer card

1. Ensure ESD antistatic wrist device is attached.
2. Remove the POWER3 SMP Wide node using the steps in “Removing a POWER3 SMP Wide Node” on page 4-27.
3. Turn the I/O expansion assembly cover locking screws and remove the cover.
4. Disconnect the interposer signal cable at J1 on the interposer card.
5. Disconnect the I/O expansion control cable at J4 on the interposer card.
6. If applicable, disconnect the SCSI cable from connector J2 on the interposer card.
7. Remove the screws securing the interposer card. Retain the screws for later installation.
8. Remove the interposer card.

Replacing the interposer card

1. Ensure ESD antistatic wrist device is attached.
2. Install the interposer card with the screws that were previously removed.
3. If applicable, connect the SCSI cable to connector J2 on the interposer card.
4. Connect the I/O expansion control cable at J4 on the interposer card.
5. Connect the interposer signal cable at J1 on the interposer card.
6. Replace the I/O expansion assembly cover. Turn the locking screws to secure the cover.
7. Reinstall the POWER3 SMP Wide Node using the steps in “Replacing a POWER3 SMP Wide Node” on page 4-28.
8. Return to the procedure that directed you here.

Removing the power/supervisor cable assembly

1. Ensure ESD antistatic wrist device is attached.
2. Remove the POWER3 SMP node using the steps in “Removing a POWER3 SMP Thin Node” on page 4-26 or “Removing a POWER3 SMP Wide Node” on page 4-27.
3. Refer to “Removing the POWER3 SMP Thin Node system planar” on page 4-38 to remove the POWER3 SMP Thin Node system planar.
4. Remove the screws holding the power/supervisor cable assembly to the rear of the chassis. Retain the screws for later installation.
5. Loosen the pin guide screws that secure the cable assembly jack to the front of the chassis.

Replacing the power/supervisor cable assembly

1. Ensure ESD antistatic wrist device is attached.
2. Tighten the pin guide screws to secure the cable assembly jack to the front of the chassis.
3. Tighten the screws holding the power/supervisor assembly to the rear of the chassis using the screws retained from the removal procedure.
4. Refer to “Replacing the POWER3 SMP Thin Node system planar” on page 4-39 to replace the POWER3 SMP Thin Node system planar.
5. Reinstall the POWER3 SMP node using the steps in “Replacing a POWER3 SMP Thin Node” on page 4-26 or “Replacing a POWER3 SMP Wide Node” on page 4-28.
6. Return to the procedure that directed you here.

Removing the power cable assembly

1. Ensure ESD antistatic wrist device is attached.
2. Remove the POWER3 SMP Wide Node using the steps in “Removing a POWER3 SMP Wide Node” on page 4-27.
3. Turn the I/O expansion assembly cover locking screws and remove the cover.
4. Remove the screws holding the power cable assembly to the rear of the chassis. Retain the screws for later installation.

5. Loosen the pin guide screws holding the cable assembly jack to the front of the chassis.
6. If necessary, cut the cable tie that secures the cable to the tie-down on the bottom of the chassis.

Replacing the power cable assembly

1. Ensure ESD antistatic wrist device is attached.
2. Secure the cable to the tie-down on the bottom of the chassis with a cable tie.
3. Tighten the pin guide screws to secure the cable assembly jack to the front of the chassis.
4. Tighten the screws holding the power assembly to the rear of the chassis using the screws retained from the removal procedure.
5. Replace the I/O expansion assembly cover. Turn the locking screws to secure the cover.
6. Reinstall the POWER3 SMP Wide Node using the steps in "Replacing a POWER3 SMP Wide Node" on page 4-28.
7. Return to the procedure that directed you here.

Removing the I/O expansion planar

1. Ensure ESD antistatic wrist device is attached.
2. Remove the POWER3 SMP Wide Node using the steps in "Removing a POWER3 SMP Wide Node" on page 4-27.
3. Turn the I/O expansion assembly cover locking screws and remove the cover.
4. Remove the PCI card(s) using the steps in "Removing the PCI adapter card" on page 4-32.
5. Remove the PCI card guide bracket.
6. Remove the remaining plugs from the I/O planar (J11, J12, J13, and J14).
7. Remove the screws securing the I/O planar.
8. Separate the I/O expansion planar and the CPU assembly I/O planar
9. Remove the I/O planar from the chassis.

Replacing the I/O expansion planar

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 3-14 or *IBM Parallel System Support Programs for AIX: Installation Guide* for this procedure.

Note: Inform the customer that the MAC address will need to be updated, see "Updating the Ethernet hardware address" on page 3-6 for this procedure.

1. Ensure ESD antistatic wrist device is attached.
2. Reinstall the I/O planar in the chassis.
3. Attach the I/O expansion planar and the CPU assembly I/O planar.
4. Reinstall the screws to secure the I/O planar.
5. Reinstall the cables into the I/O planar (J11, J12, J13, and J14).
6. Install the PCI card guide bracket.
7. Replace the PCI card(s) using the steps in "Replacing the PCI adapter card" on page 4-33.
8. Replace the I/O expansion assembly cover. Turn the locking screws to secure the cover.
9. Replace the POWER3 SMP Wide Node using the steps in "Replacing a POWER3 SMP Wide Node" on page 4-28.
10. Return to the procedure that directed you here.

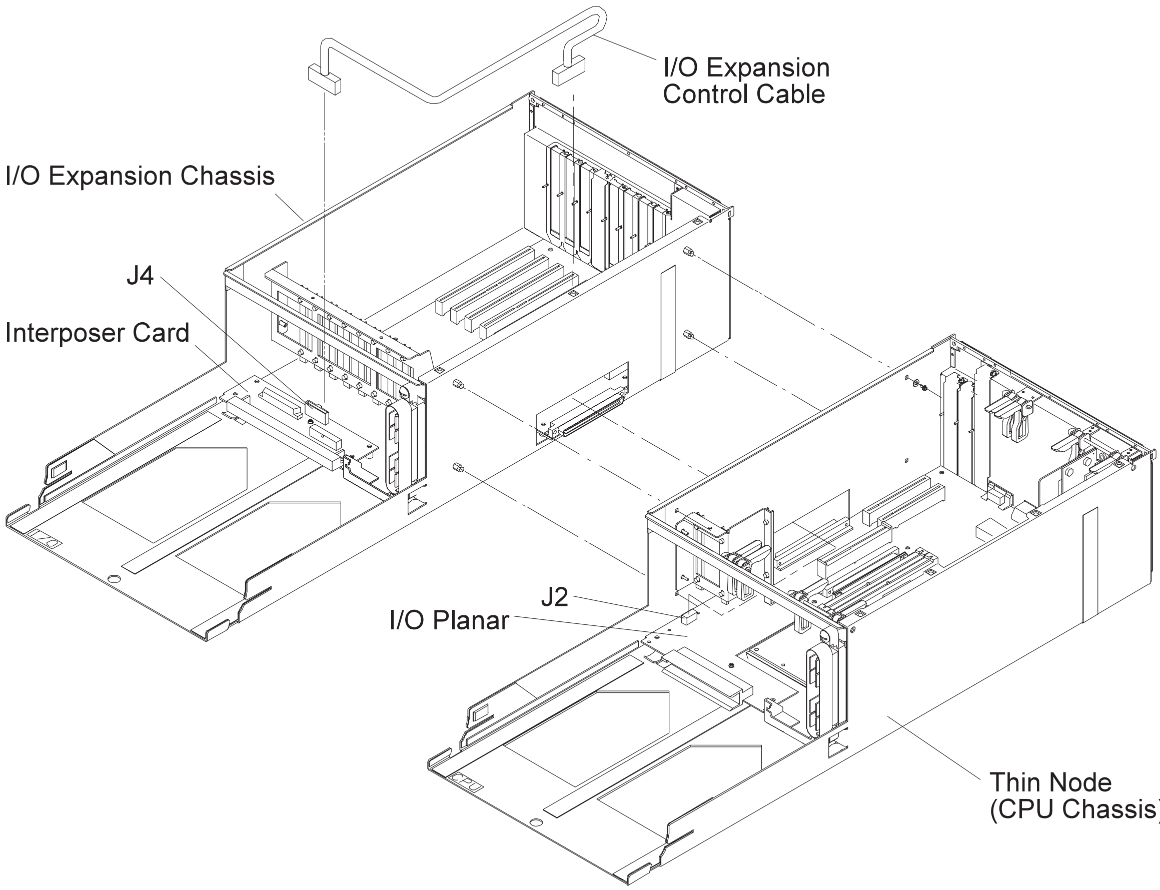


Figure 4-19. POWER3 SMP Wide Node I/O expansion control cable

Removing the I/O expansion control cable

1. Ensure ESD antistatic wrist device is attached.
2. Remove the POWER3 SMP Wide Node using the steps in "Removing a POWER3 SMP Wide Node" on page 4-27.
3. Turn the locking screws on the CPU assembly and I/O expansion covers and remove the covers.
4. Disconnect the expansion control cable at J4 on the interposer card in the I/O expansion assembly.
5. Note the location of any adapter cards.
6. Remove the adapter cards (see "Removing the SPS MX2 adapter card" on page 4-32 and "Removing the PCI adapter card" on page 4-32).
7. Remove the card guide mounting nuts and remove the card guide.
8. Disconnect the I/O expansion control cable at J2 on the I/O planar in the Thin Node and remove the cable.
9. If necessary, cut the cable tie that secures the cable to the tie-down on the bottom of the chassis.

Replacing the I/O expansion control cable

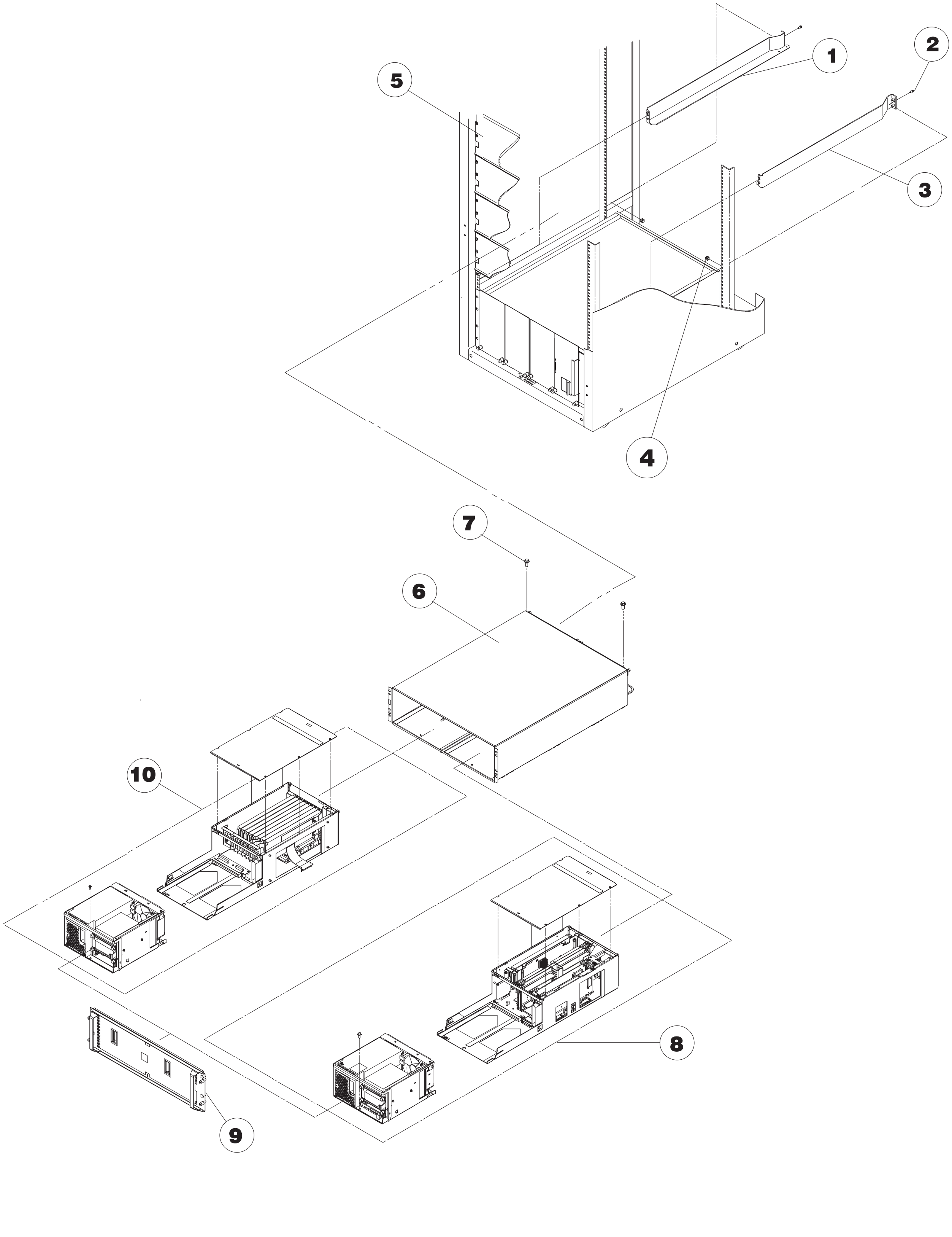
1. Ensure ESD antistatic wrist device is attached.
2. Connect the expansion control cable at J2 on the I/O planar in the thin node.
3. Replace the card guide and secure with the mounting nuts.
4. Replace adapter cards in the locations noted in the removal procedure (see "Replacing the SPS MX2 adapter card" on page 4-32 and "Replacing the PCI adapter card" on page 4-33).
5. Connect the expansion control cable at J4 on the interposer card in the I/O expansion assembly.
6. Replace the CPU assembly and I/O expansion covers. Turn the locking screws to secure the covers.

7. Reinstall the POWER3 SMP Wide Node using the steps in “Replacing a POWER3 SMP Wide Node” on page 4-28.
8. Return to the procedure that directed you here.

Chapter 5. RS/6000 SP parts catalog

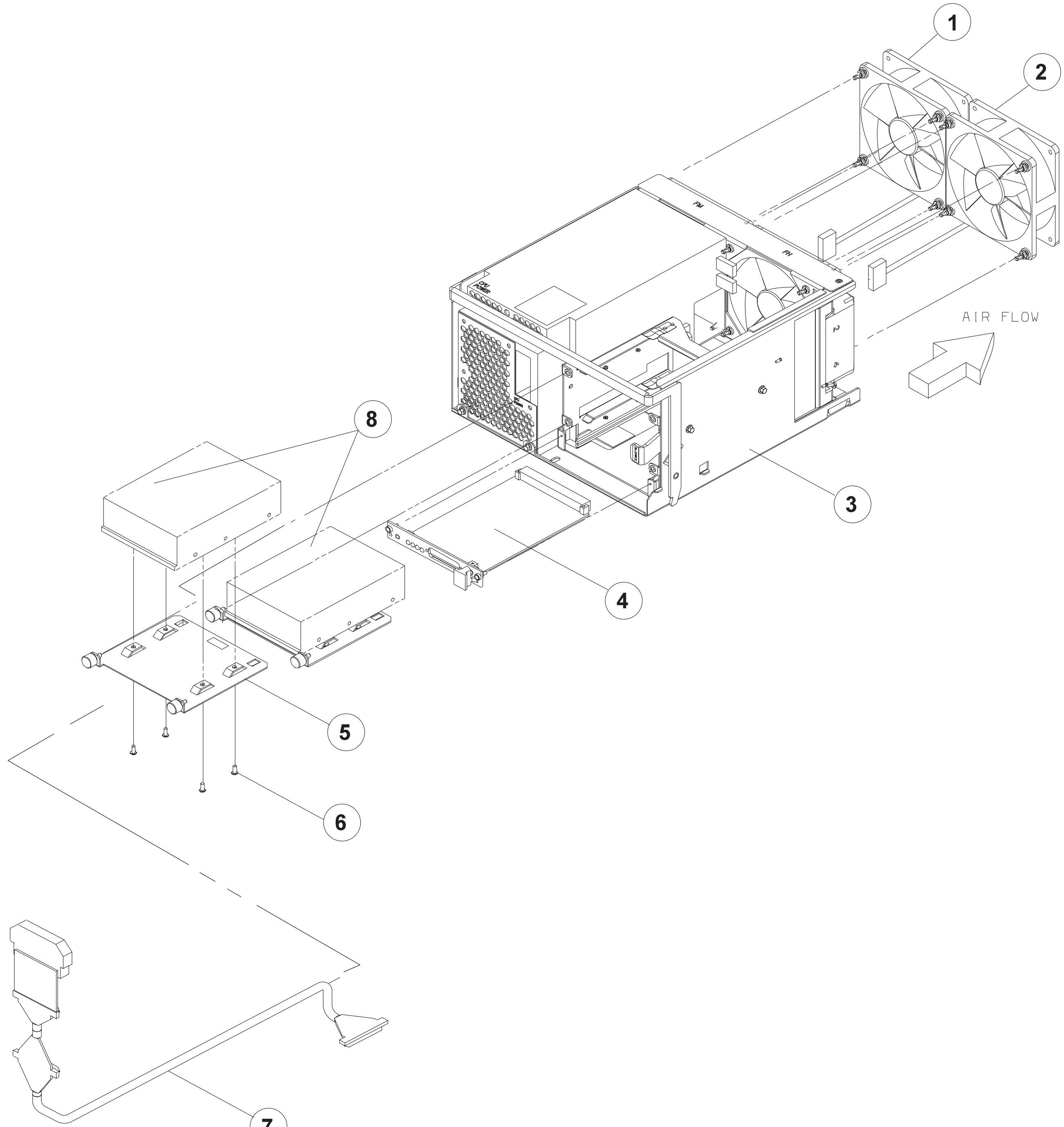
This chapter presents the Parts Catalog, listing all RS/6000 SP parts and FRUs, with corresponding figures containing indexed descriptions.

Assembly 1: 332 MHz Symmetric MultiProcessor (SMP) Thin and Wide Nodes



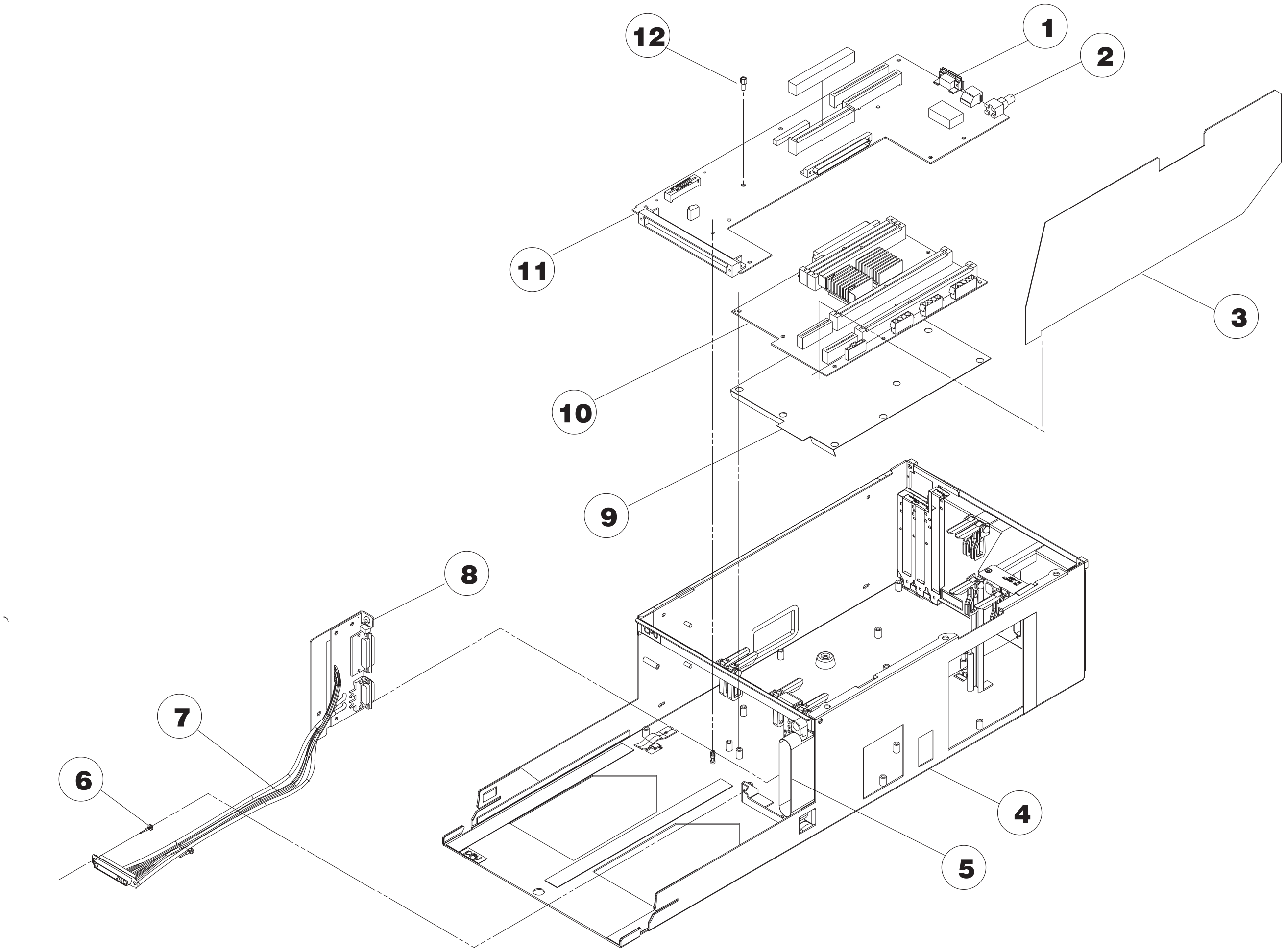
Asm–Index	Part Number	Units	Description
1–3		AR	332 MHz Symmetric MultiProcessor (SMP) Nodes
–1	51H9427	1	• Rail, Left
–2	77G0599	2	• Screw
–3	51H9426	1	• Rail, Right
–4	0375867	2	• Nut Clip
–5	11J4774	1	• Panel, Blank
–6	21L3953	1	• 332 MHz SMP Node Enclosure
–7	1624763	2	• • Screw
–	21L2727	4	• • Wear Strip "A" (not shown)
–	21L2728	2	• • Wear Strip "A1" (not shown)
–	21L2729	2	• • Wear Strip "B" (not shown)
–	21L2732	2	• • Wear Strip "C" (not shown)
–8			• 332 MHz SMP Thin Node (reference only, see "Assembly 2: 332 MHz SMP Thin Node asm (F/C 2050) (view 1)" on page 5-4)
–9	21L3060	1	• Panel Asm, Front
–10			• 332 MHz SMP I/O Expansion Asm (reference only, see "Assembly 8: 332 MHz SMP I/O Expansion asm (view 1)" on page 5-16)

Assembly 2: 332 MHz SMP Thin Node asm (F/C 2050) (view 1)



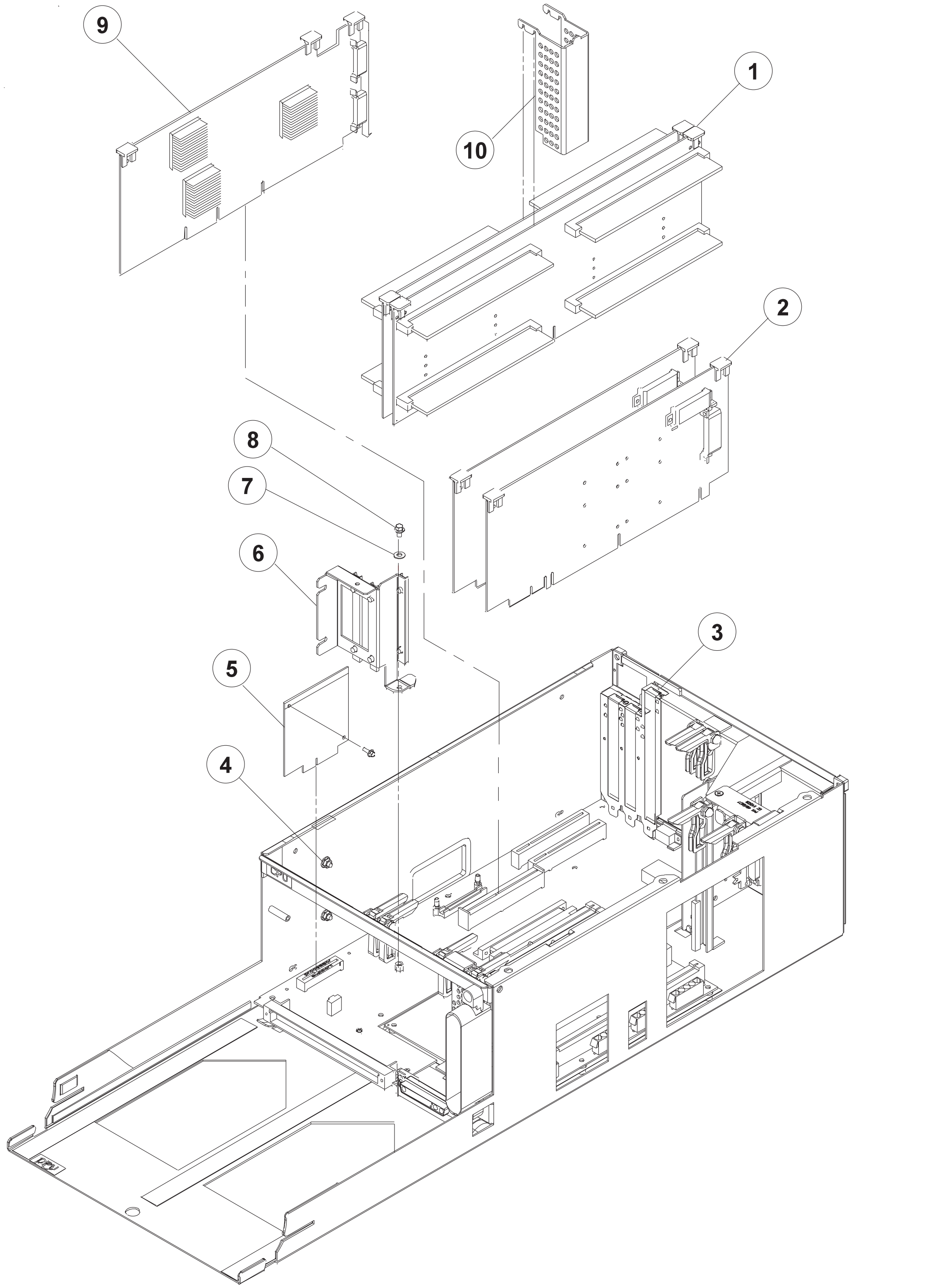
Asm–Index	Part Number	Units	Description
2–			332 MHz SMP Thin Node Assembly (F/C 2050) (View 1) (reference only)
–3	11J6523	1	CPU Power Asm
–1	11J6513	1	• Fan Asm, Med Spd
–2	11J6514	1	• Fan Asm, High Spd
–4	05N5775	1	• Card, Supervisor
–5	11J3928	2	• DASD Sled Asm
–6	0055726	4	• • Screw, 6-32
–7	08J6105	1	• SCSI Cable Asm, DASD, 2-drop
–8		AR	• DASD (reference only) (See “DASD part numbers” on page 5-42.)

Assembly 3: 332 MHz SMP Thin Node asm (F/C 2050) (view 2)



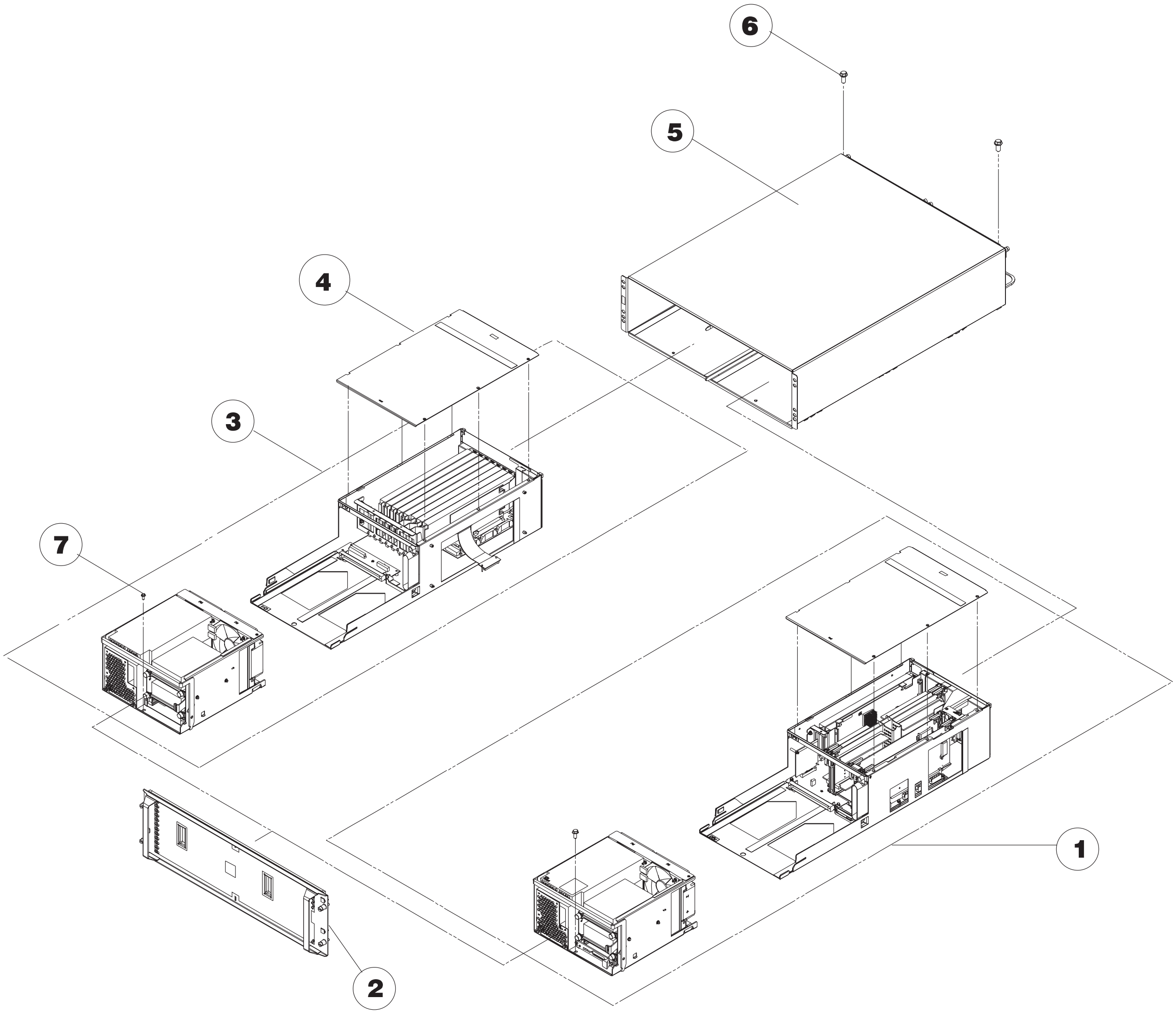
Asm–Index	Part Number	Units	Description
3–			332 MHz SMP Thin Node Assembly (F/C 2050) (View 2) (reference only)
–1	11J5248	1	• Gasket, EMC
–	51H8738	2	• • Standoff
–	1622316	2	• • Washer
–2	84X3459	1	• Nut, Hex
–2	84X3460	1	• Washer
–3	11J5244	1	• Shield
–4	05N4992	1	• Chassis, Thin Node
–5	51H9362	1	• Cable Asm, Planar Power
–	6340846	2	• • Screw, Shoulder
–6	51H9358	2	• Pin, Guide
–7	11J5197	1	• Cable Asm, Power/Supervisor
–8	51H8738	4	• • Standoff
–	1622316	4	• • Washer
–	1624763	4	• • Screw, M4x5
–9	11J3866	1	• Insulator
–10	07L9718	1	• Planar, System
–	1624765	9	• • Screw, M4x8
–11	08L0626	1	• Planar, I/O
–	1624765	8	• • Screw, M4x8
–12	51H9412	1	• Standoff, Hex
–13	21L3046	1	• Cover (not shown)

Assembly 4: 332 MHz SMP Thin Node asm (F/C 2050) (view 3)



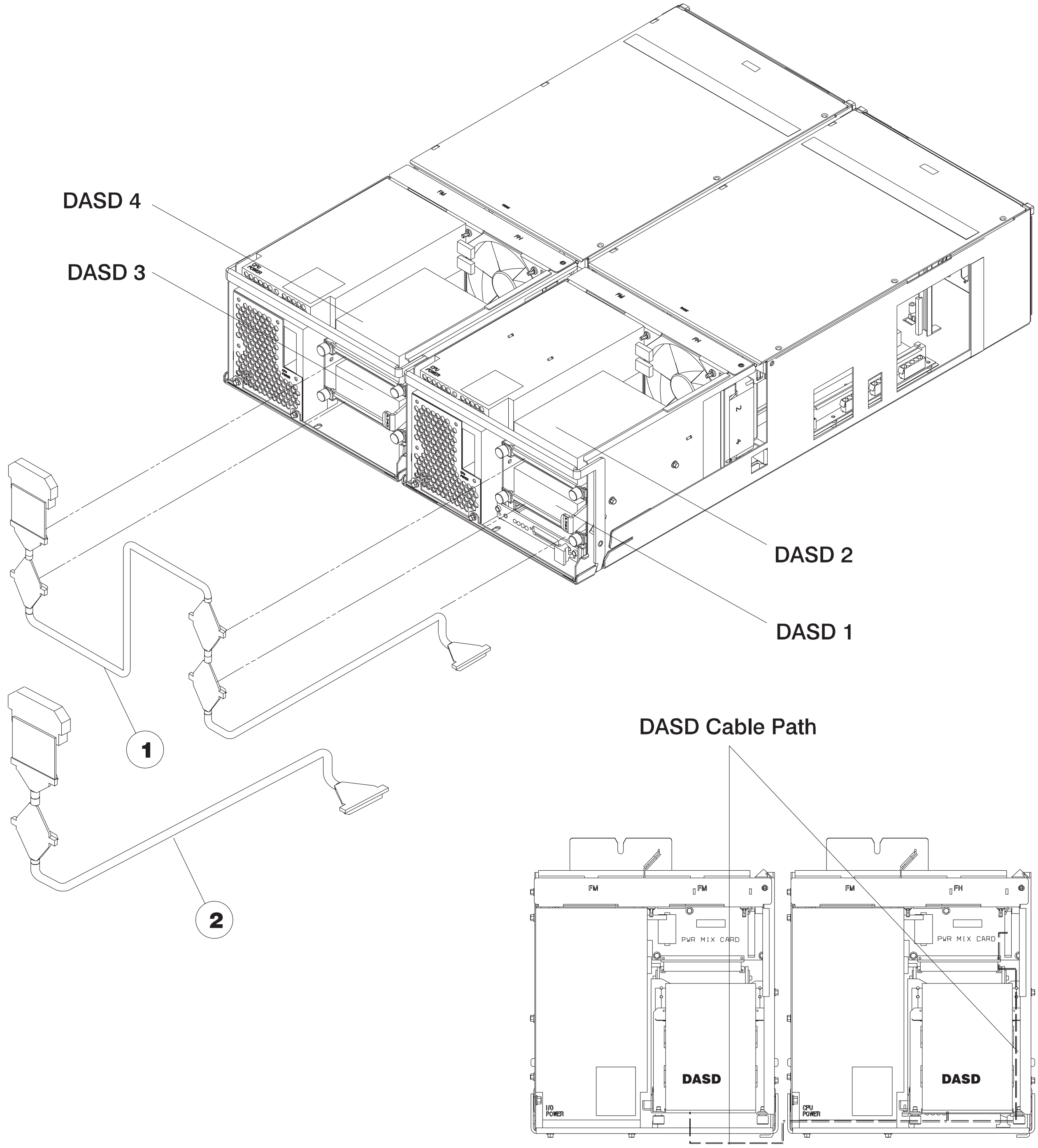
Asm–Index	Part Number	Units	Description
4–			332 MHz SMP Thin Node Assembly (F/C 2050) (View 3) (reference only)
–1	93H2641	AR	• Cards, Memory (reference only)
–	93H4702	AR	• DIMM, 128 MB (See Table 5-3 on page 5-43.)
–2	93H9716	2	• Cards, Processor (reference only)
–3	78X8993	3	• Screw, M3x8
–4	84X4841	2	• Nut, M4
–5	08L0442	1	• Service Processor
–	1624743	1	• • Screw, M3
–6	11J5205	1	• Bracket Asm, Card Guide
–6	21L3926	1	• Bracket Asm, Card Guide
–6	31L7264	1	• Bracket Asm, Card Guide
–7	0418787	1	• Washer, Flat
–8	1624763	1	• Screw, M4x5
–9	31L7766	1	• Adapter, SPS MX (F/C 4022)
–10	11J3865	1	• Air Baffle

Assembly 5: 332 MHz SMP Wide Node asm (F/C 2051) (view 1)



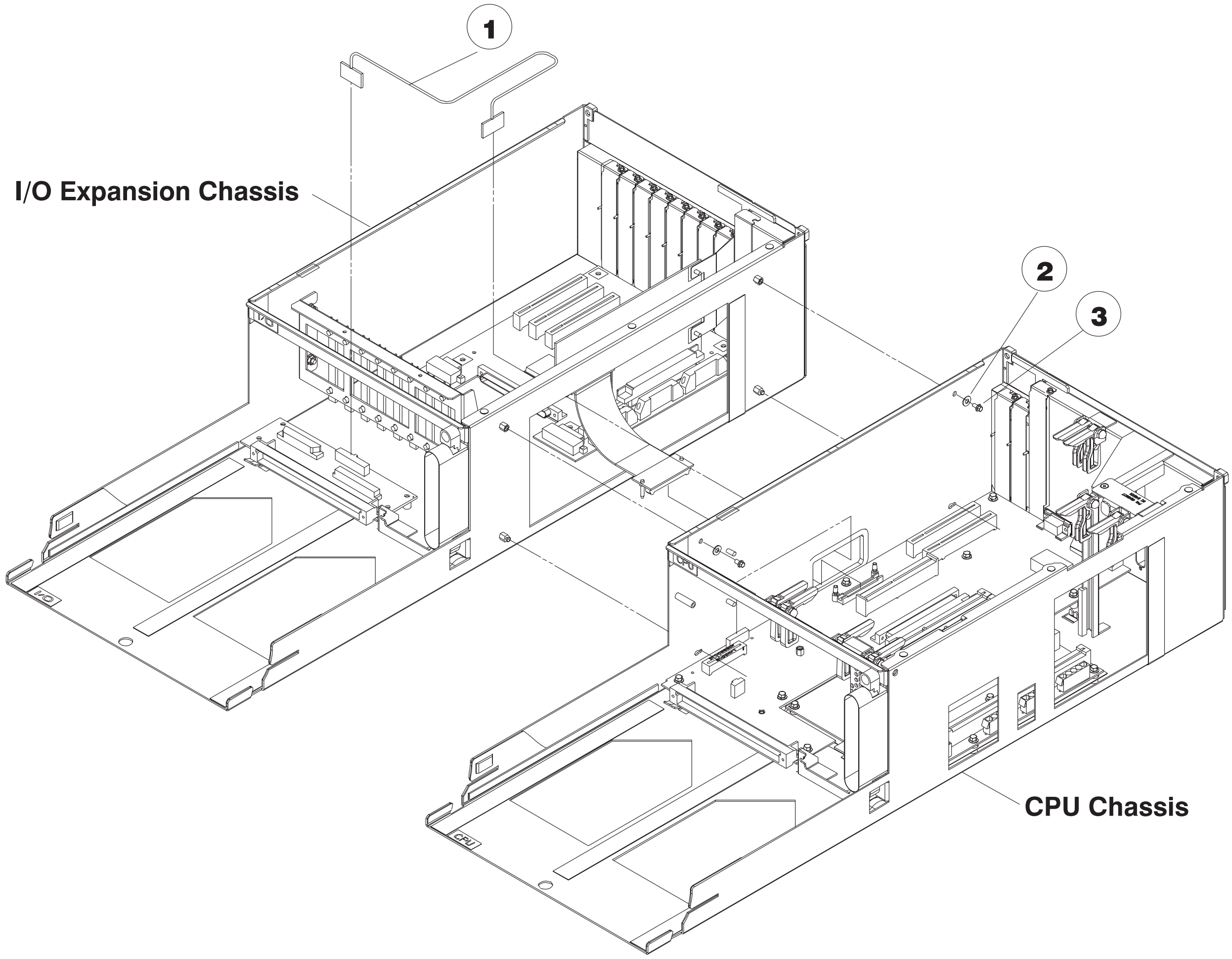
Asm– Index	Part Number	Units	Description
5–			332 MHz SMP Wide Node Assembly (F/C 2051) (View 1) (reference only)
–1			• 332 MHz SMP Thin Node (reference only)
–3			• 332 MHz SMP I/O Expansion Asm (reference only)
–4	21L3046	2	• Cover Asm
–5	21L3953	1	Enclosure, 332 MHz SMP Node
–6	1624763	2	• Screw
–2	21L3060	1	Panel Asm, Front
–7	17H5026	2	• Screw

Assembly 6: 332 MHz SMP Wide Node asm (F/C 2051) (view 2)



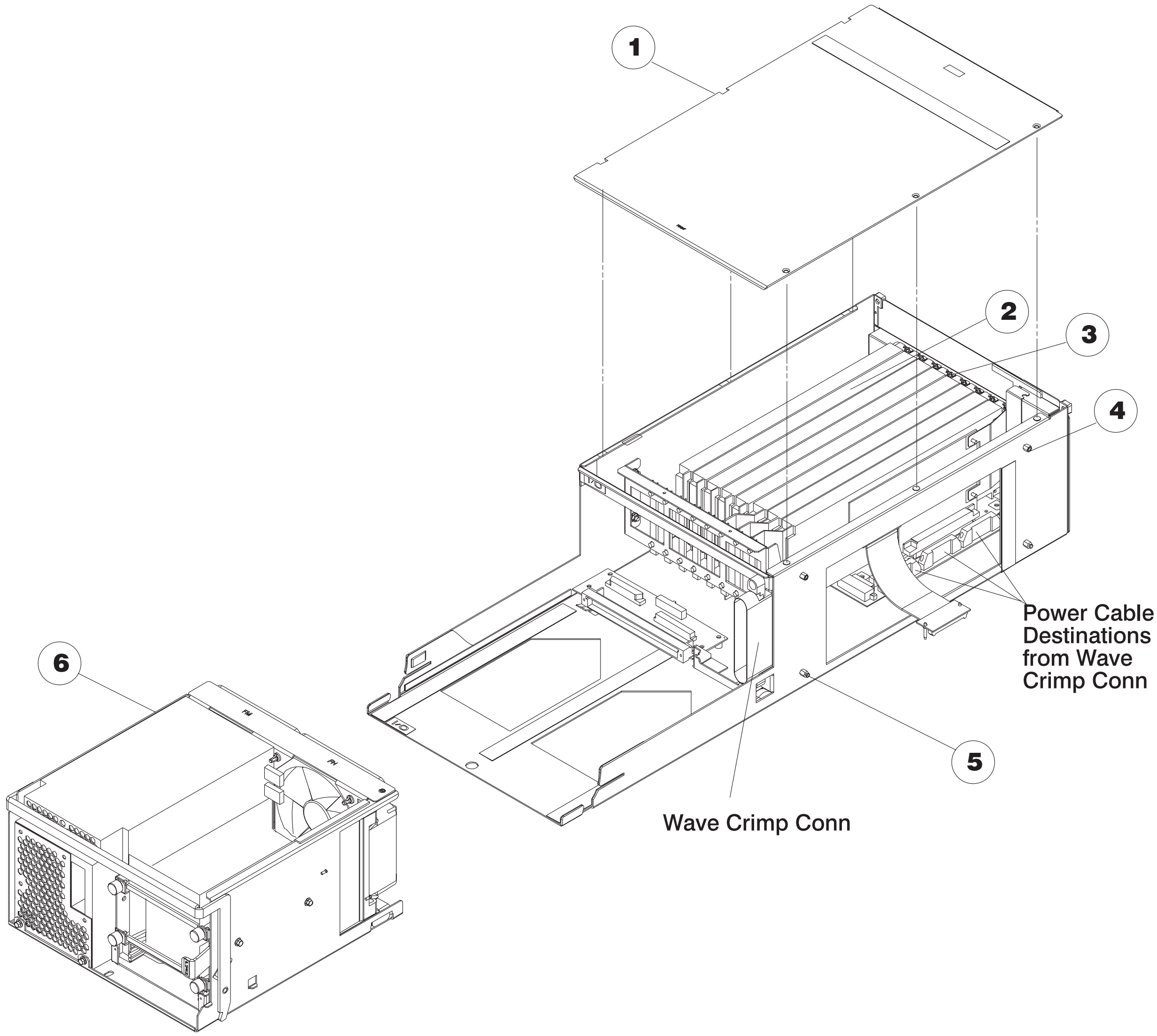
Asm– Index	Part Number	Units	Description
6–			332 MHz SMP Wide Node Assembly (F/C 2051) (View 2) (reference only)
–1	11J5177	1	• SCSI Cable Asm, DASD, 4-Drop
–2	08J6105	AR	• SCSI Cable Asm, DASD, 2-Drop

Assembly 7: 332 MHz SMP Wide Node asm (F/C 2051) (view 3)



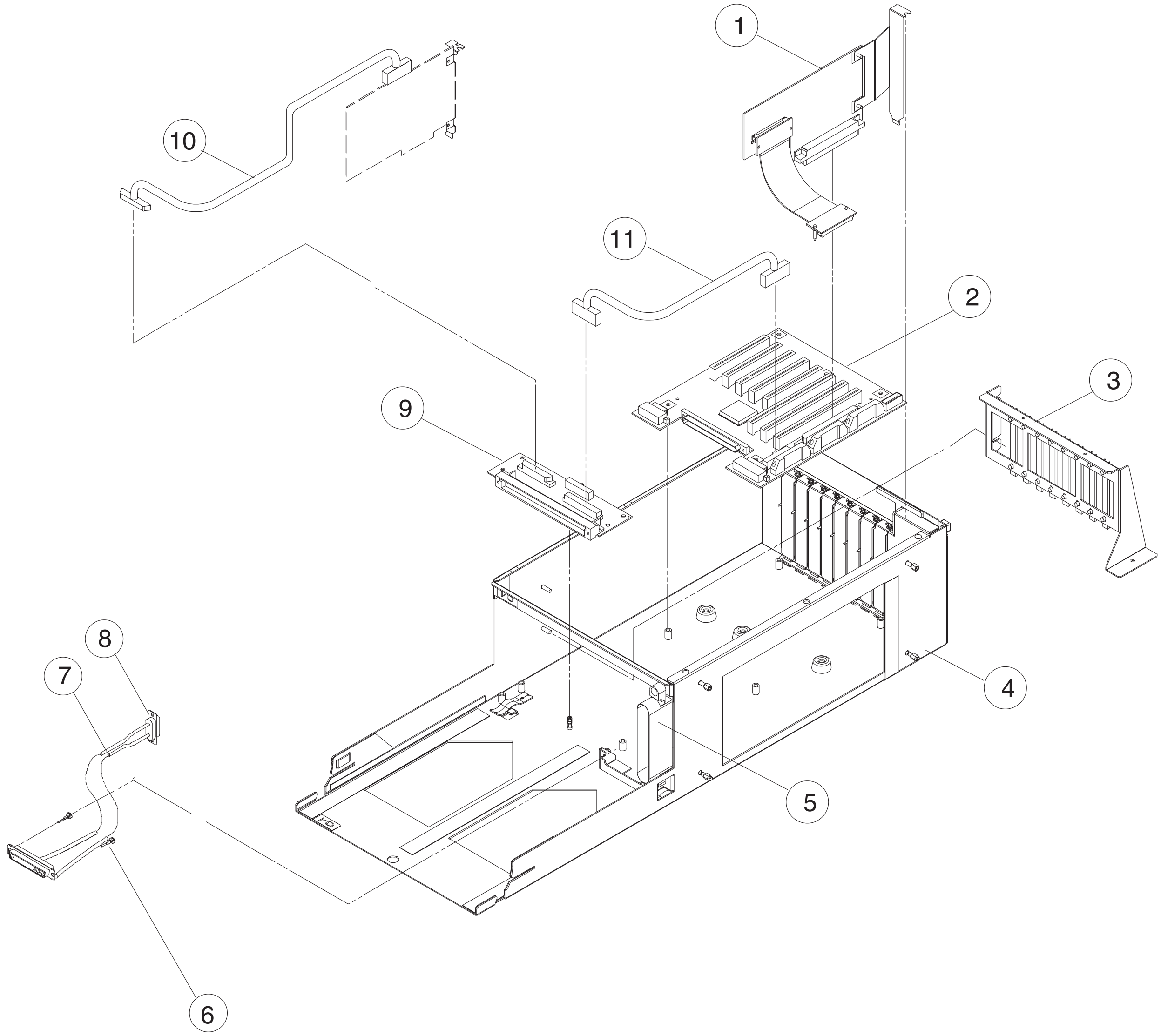
Asm– Index	Part Number	Units	Description
7–			332 MHz SMP Wide Node Assembly (F/C 2051) (View 3) (reference only)
–1	51H9389	1	• Cable, I/O Expansion Control
–2	0418787	2	• Washer, Flat
–3	1624763	2	• Screw, M4x5

Assembly 8: 332 MHz SMP I/O Expansion asm (view 1)



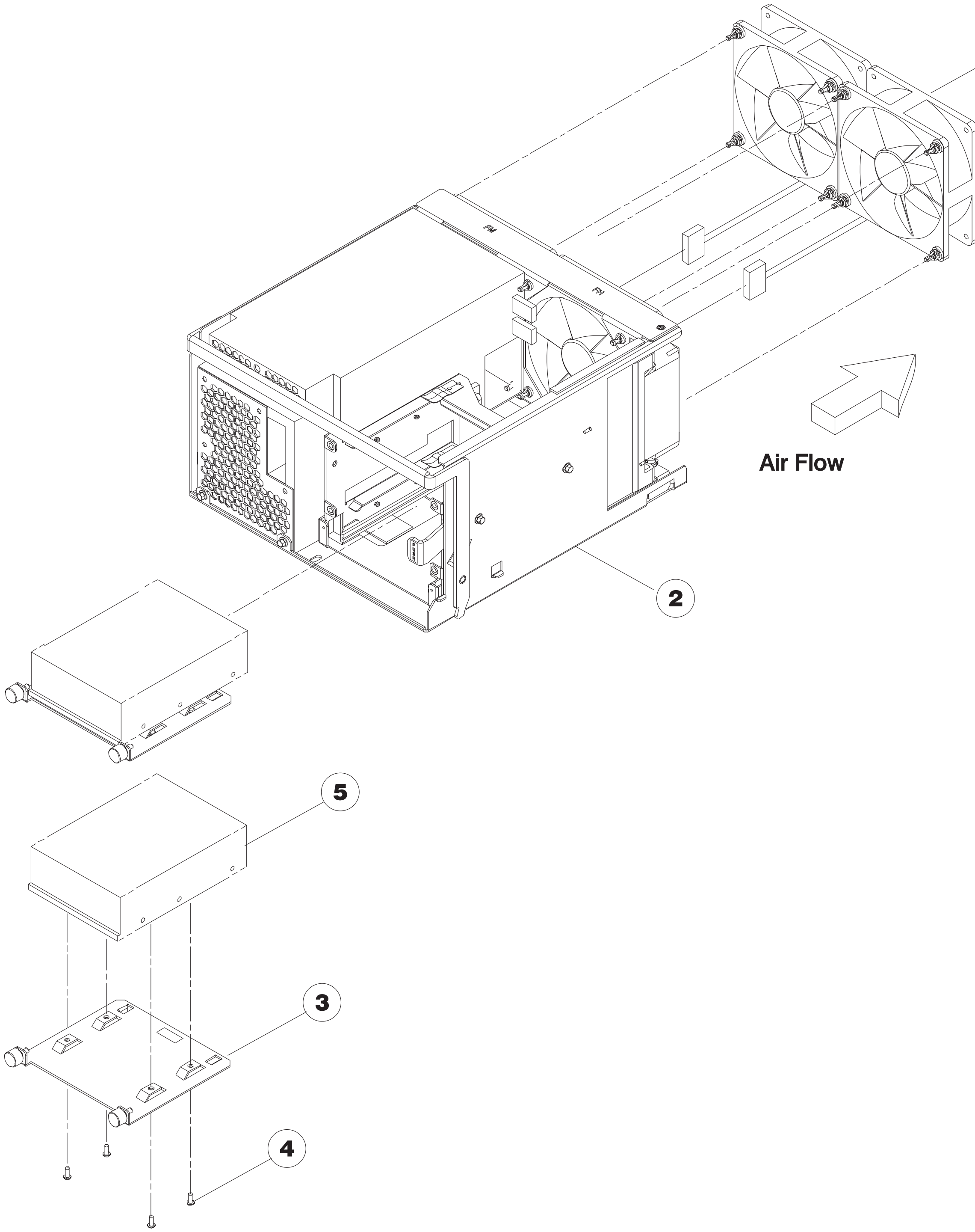
Asm–Index	Part Number	Units	Description
8–			332 MHz SMP I/O Expansion Assembly (View 1) (reference only)
–1	21L3046	1	• Cover Asm
–2		AR	• Cards, PCI (reference only)
–3	78X8993	8	• Screw, M3x8
–4	51H9412	2	• Standoff, Hex M4
–5	51H9384	2	• Standoff, Key Head
–6	11J6524	1	• I/O Expansion Power Asm

Assembly 9: 332 MHz SMP I/O Expansion asm (view 2)



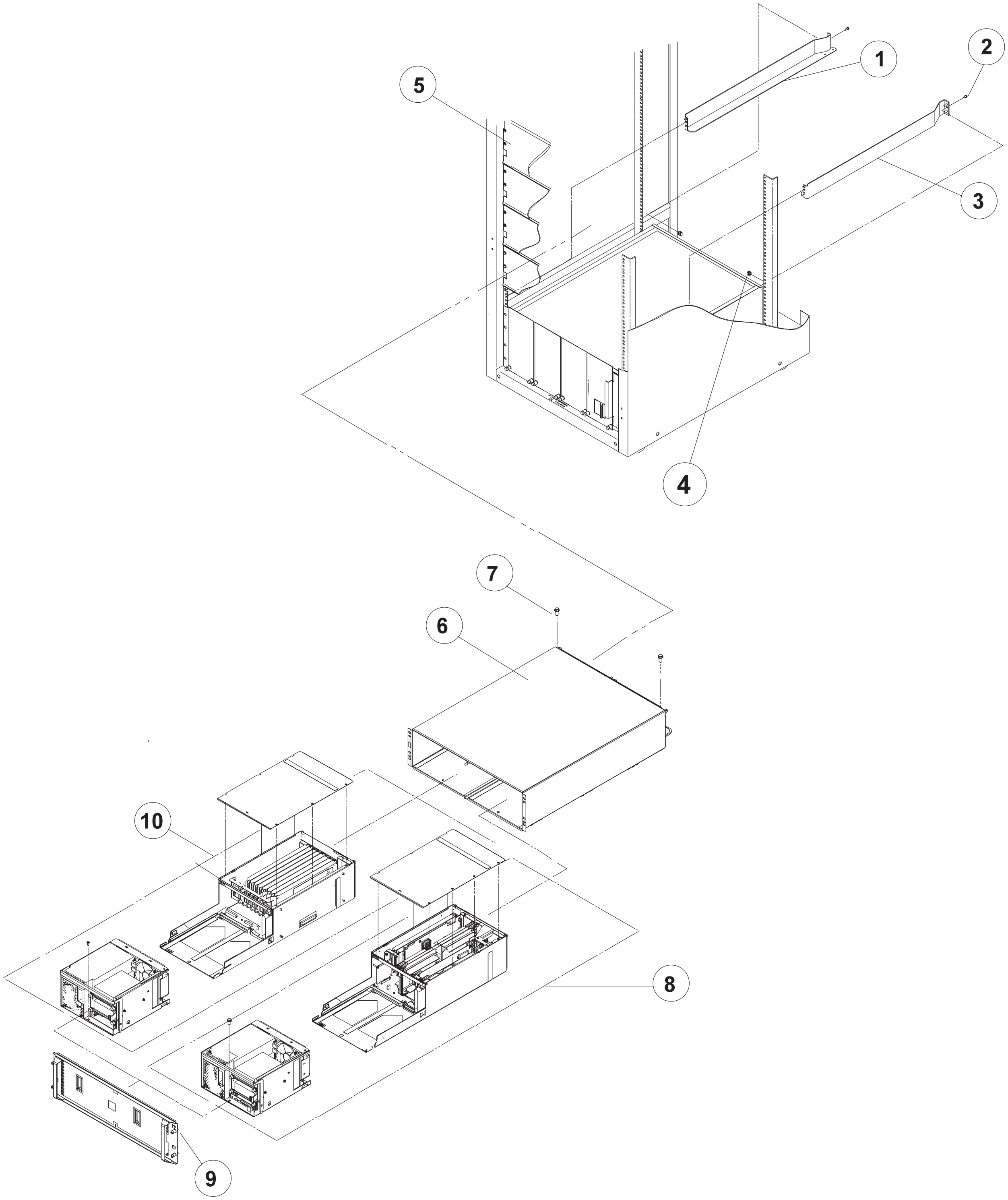
Asm– Index	Part Number	Units	Description
9–			332 MHz SMP I/O Expansion Assembly (View 2) (reference only)
–1	93H3316	1	• Card, PCI Riser
–	78X8993	1	• • Screw, M3x8
–2	93H3202	1	• Planar, PCI Expansion
–	1624765	5	• • Screw, M4x8
–3	21L3927	1	• PCI Guide Asm, 8-position
–	84X4841	3	• • Nut, M4
–4	21L3878	1	• Chassis Asm, I/O Expansion
–5	51H9385	1	• Cable Asm, PCI Power
–	6340846	2	• • Screw, Shoulder
–6	51H9358	2	• Pin, Guide
–7	11J6147	1	• Cable Asm, Power
–8	51H8738	2	• • Standoff
–	1622316	2	• • Lock Washer
–9	11J3899	1	• Card, Interposer
–	1624765	4	• • Screw, M4x8
–10	08J6111	1	• Cable Asm (reference only), Alternate DASD Cabling (F/C 1241)
–11	51H9386	1	• Cable Asm, Interposer signal

Assembly 10: 332 MHz SMP I/O Expansion asm (view 3)



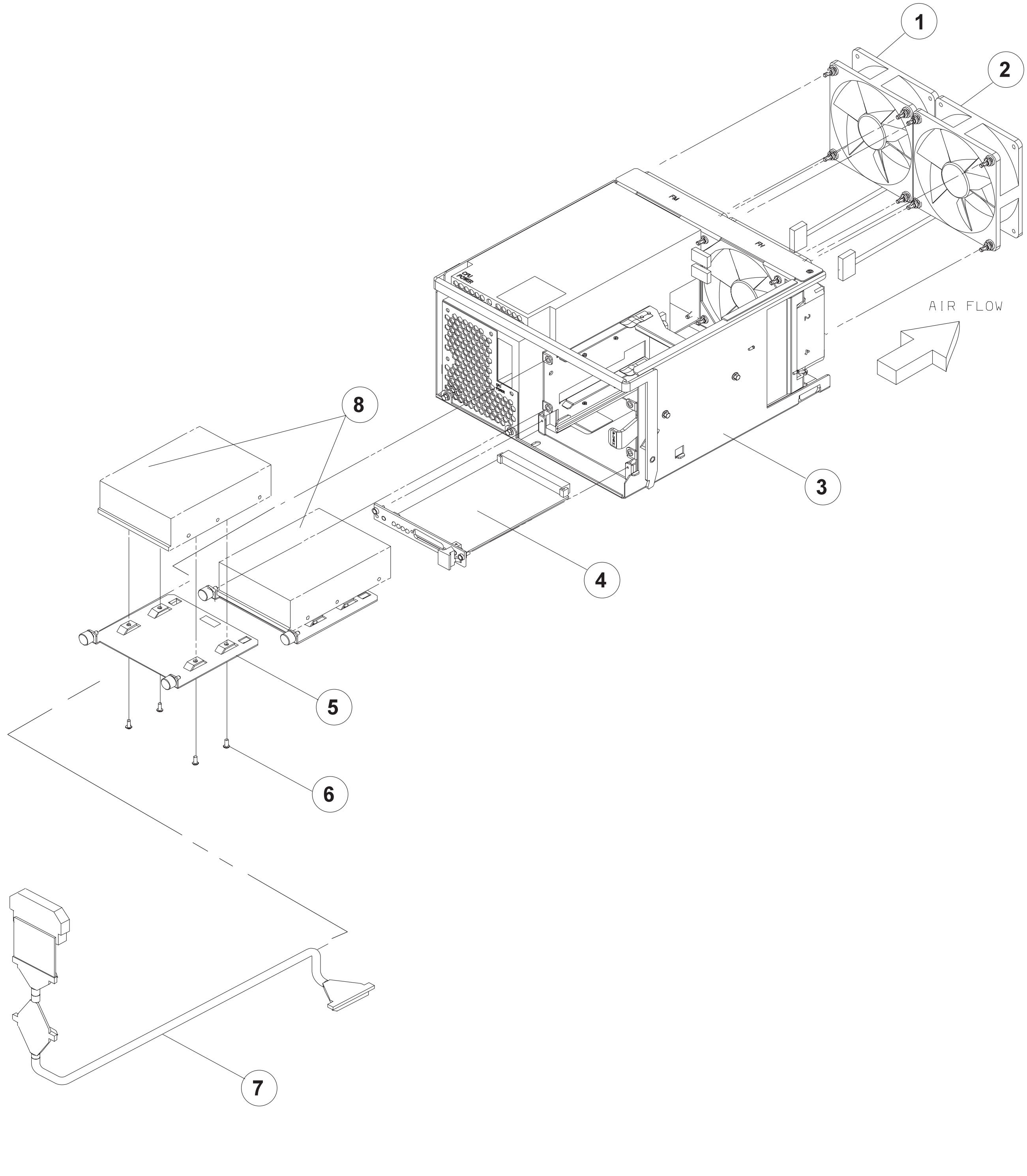
Asm–Index	Part Number	Units	Description
10–			332 MHz SMP I/O Expansion Assembly (View 3) (reference only)
–1	11J6513	2	• Fan Asm, Med Spd
–2	11J6524	1	• I/O Power Asm
–3	11J3928	2	• DASD Sled Asm
–4	0055726	4	• Screw, 6-32
–5		AR	• DASD (reference only) (See “DASD part numbers” on page 5-42.)

Assembly 11: POWER3 Symmetric MultiProcessor (SMP) Thin and Wide Nodes



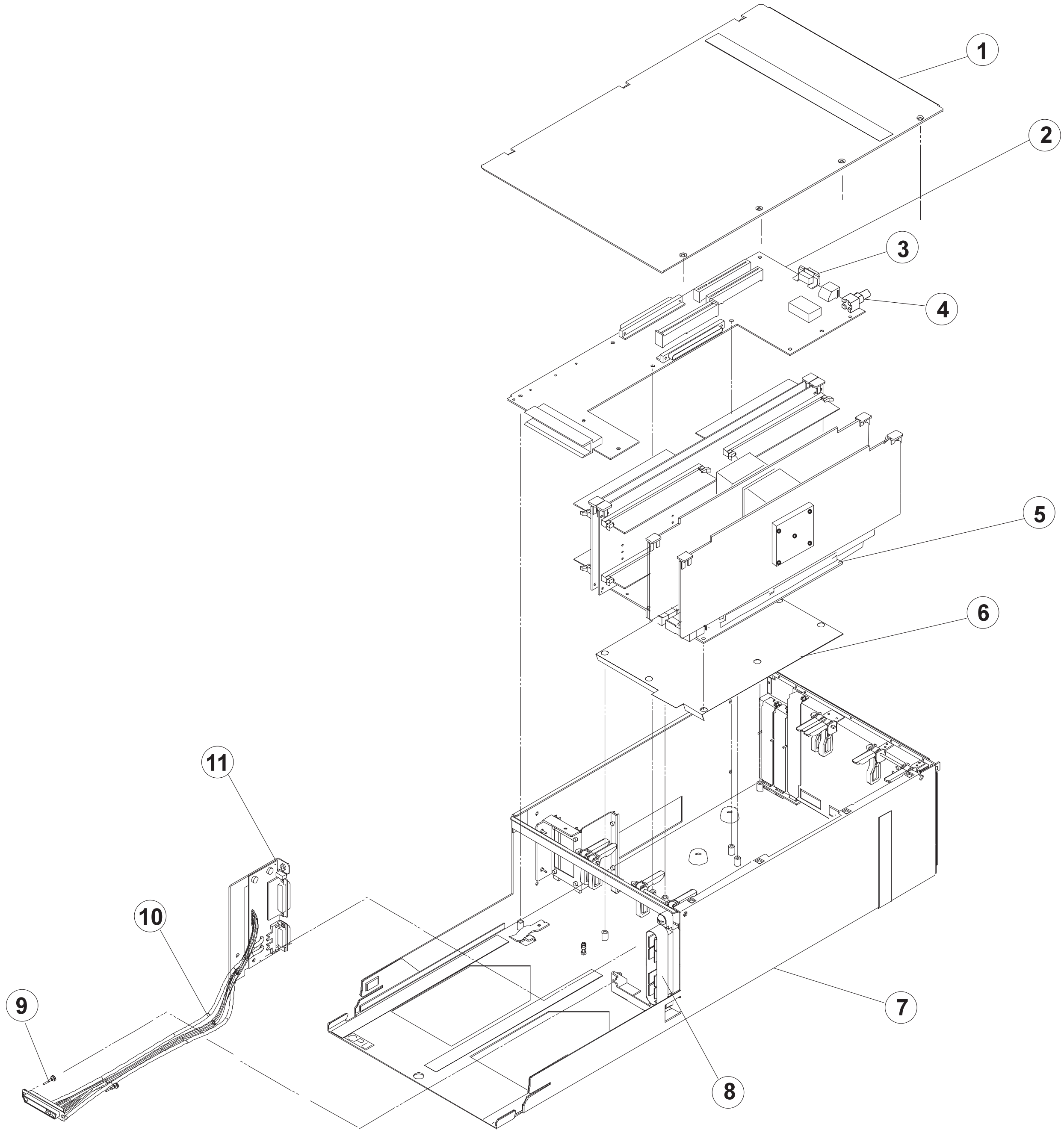
Asm– Index	Part Number	Units	Description
11–3		AR	POWER3 Symmetric MultiProcessor (SMP) 200 MHz and 375 MHz Thin and Wide Nodes
–1	51H9427	1	• Rail, Left
–2	77G0599	2	• Screw
–3	51H9426	1	• Rail, Right
–4	0375867	2	• Nut Clip
–	46G6953	1	• Shelf Assembly - Thin Node (Not shown)
–5	11J4774	1	• Panel, Blank
–6	21L3953	1	• POWER3 SMP Thin and Wide Node Enclosure
–7	1624763	2	• • Screw
–	21L2727	4	• • Wear Strip "A" (not shown)
–	21L2728	2	• • Wear Strip "A1" (not shown)
–	21L2729	2	• • Wear Strip "B" (not shown)
–	21L2732	2	• • Wear Strip "C" (not shown)
–8			• POWER3 SMP Thin Node (reference only, see "Assembly 12: POWER3 SMP Thin Node asm (F/C 2052/2056) (view 1)" on page 5-24)
–9	11J3884	1	• Panel Asm, Front
–10			• POWER3 SMP Wide Node I/O Expansion Asm (reference only, see "Assembly 18: POWER3 SMP Wide Node I/O Expansion asm (view 1)" on page 5-36)

Assembly 12: POWER3 SMP Thin Node asm (F/C 2052/2056) (view 1)



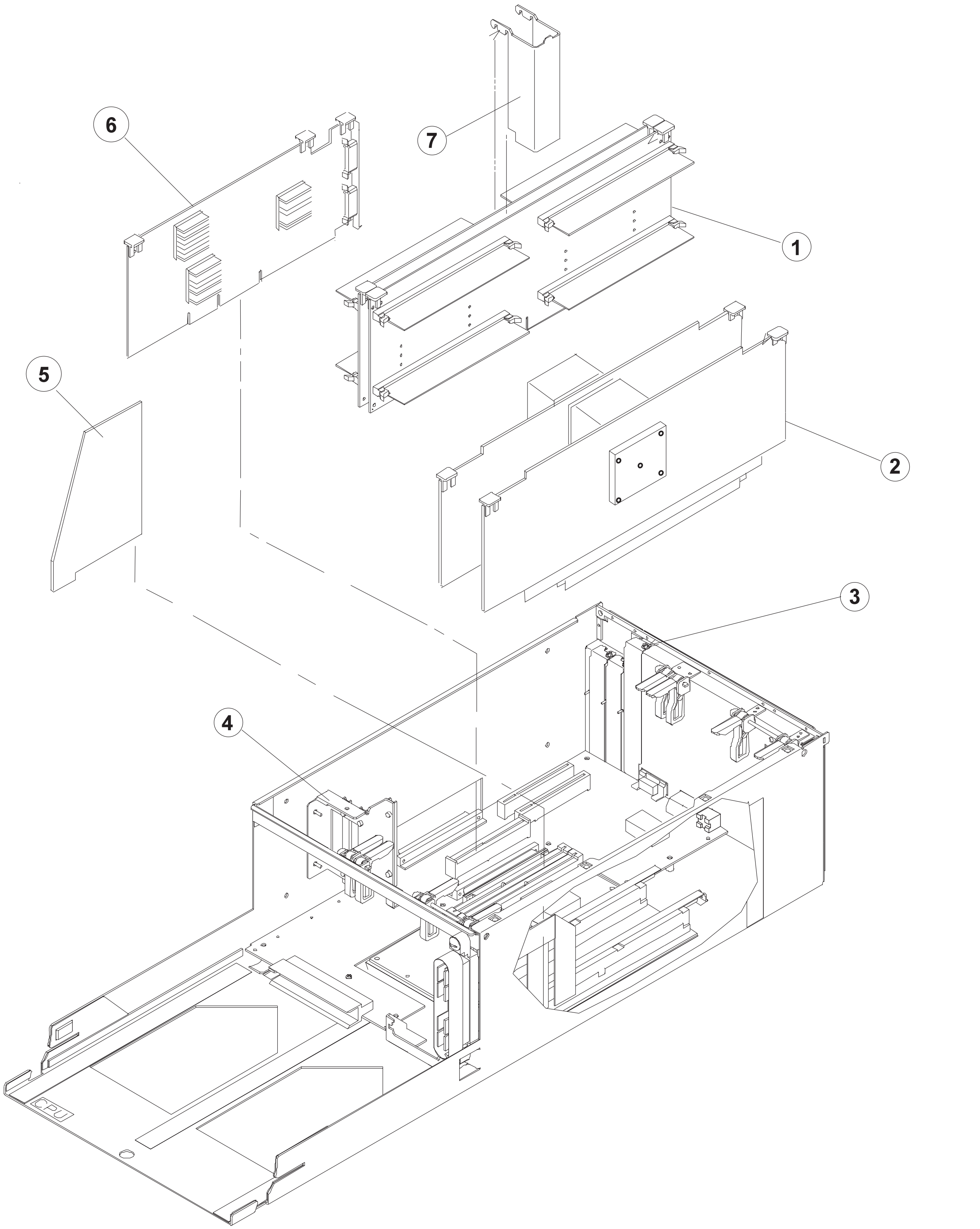
Asm–Index	Part Number	Units	Description
12–			POWER3 SMP Thin Node Assembly (F/C 2052/2056) (View 1) (reference only)
–3	31L7865	1	CPU Power Asm
–1	11J6513	1	• Fan Asm, Med Spd
–2	11J6514	1	• Fan Asm, High Spd
–4	05N5775	1	• Card, Supervisor
–5	11J3928	2	• DASD Sled Asm
–6	0055726	4	• • Screw, 6-32
–7	08J6105	1	• SCSI Cable Asm, DASD, 2-drop
–8		AR	• DASD (reference only) (See “DASD part numbers” on page 5-42.)
–	31L7838	1	• Bracket, keying (not shown) 31L7838 is found only on early releases of the POWER3 SMP thin node.

Assembly 13: POWER3 SMP Thin Node asm (F/C 2052/2056) (view 2)



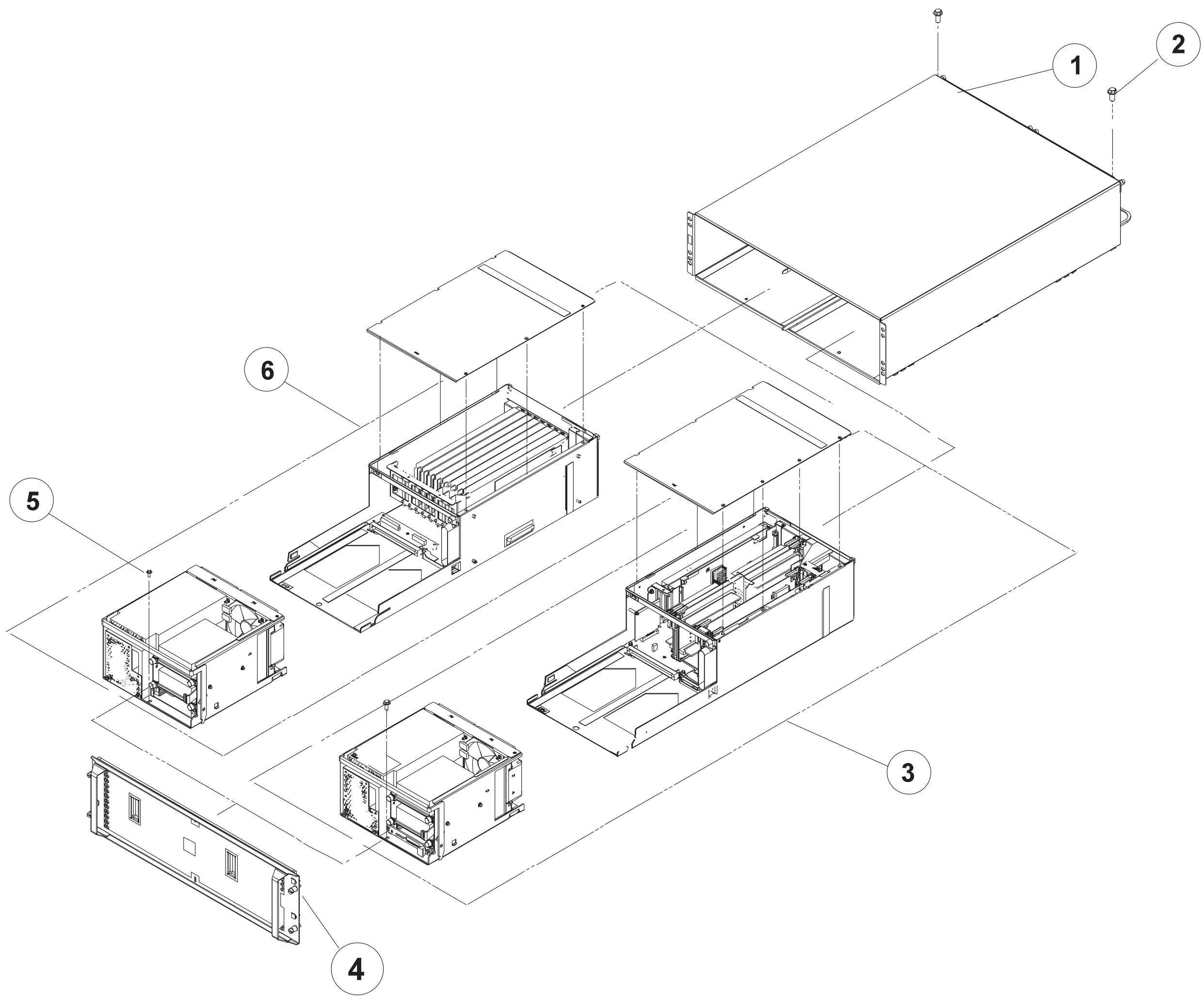
Asm– Index	Part Number	Units	Description
13–			POWER3 SMP Thin Node Assembly (F/C 2052/2056) (View 2) (reference only)
–1	31L7204	1	• Cover
–2	07L8240	1	• Planar, I/O (200 MHz POWER3 SMP Thin and Wide Nodes)
–2	03N3368	1	• Planar, I/O (375 MHz POWER3 SMP Thin and Wide Nodes)
–	1624766	8	• • Screw, M4x10
–3	11J5248	1	• • Gasket, EMC
–	51H8738	2	• • • Screw Lock
–	1622316	2	• • • Washer, Lock
–4	84X3459	1	• • Nut, Hex
–4	84X3460	1	• • Washer
–5	08L1303	1	• Planar, System (200 MHz POWER3 SMP Thin and Wide Nodes)
–5	08L0988	1	• Planar, System (375 MHz POWER3 SMP Thin and Wide Nodes)
–	1624766	8	• • Screw, M4x10
–6	21L2885	1	• Insulator
–7	31L7117	1	• Chassis, Thin Node
–8	21L2887	1	• Cable Asm, Planar Power
–	21L2889	2	• • Screw, Shoulder
–9	51H9358	2	• Pin, Guide
–10	31L8512	1	• Cable Asm, Power/Supervisor
–11	51H8738	4	• Standoff
–	1624763	4	• • Screw, M4x5
–	1622316	4	• • Washer, Lock

Assembly 14: POWER3 SMP Thin Node asm (F/C 2052/2056) (view 3)



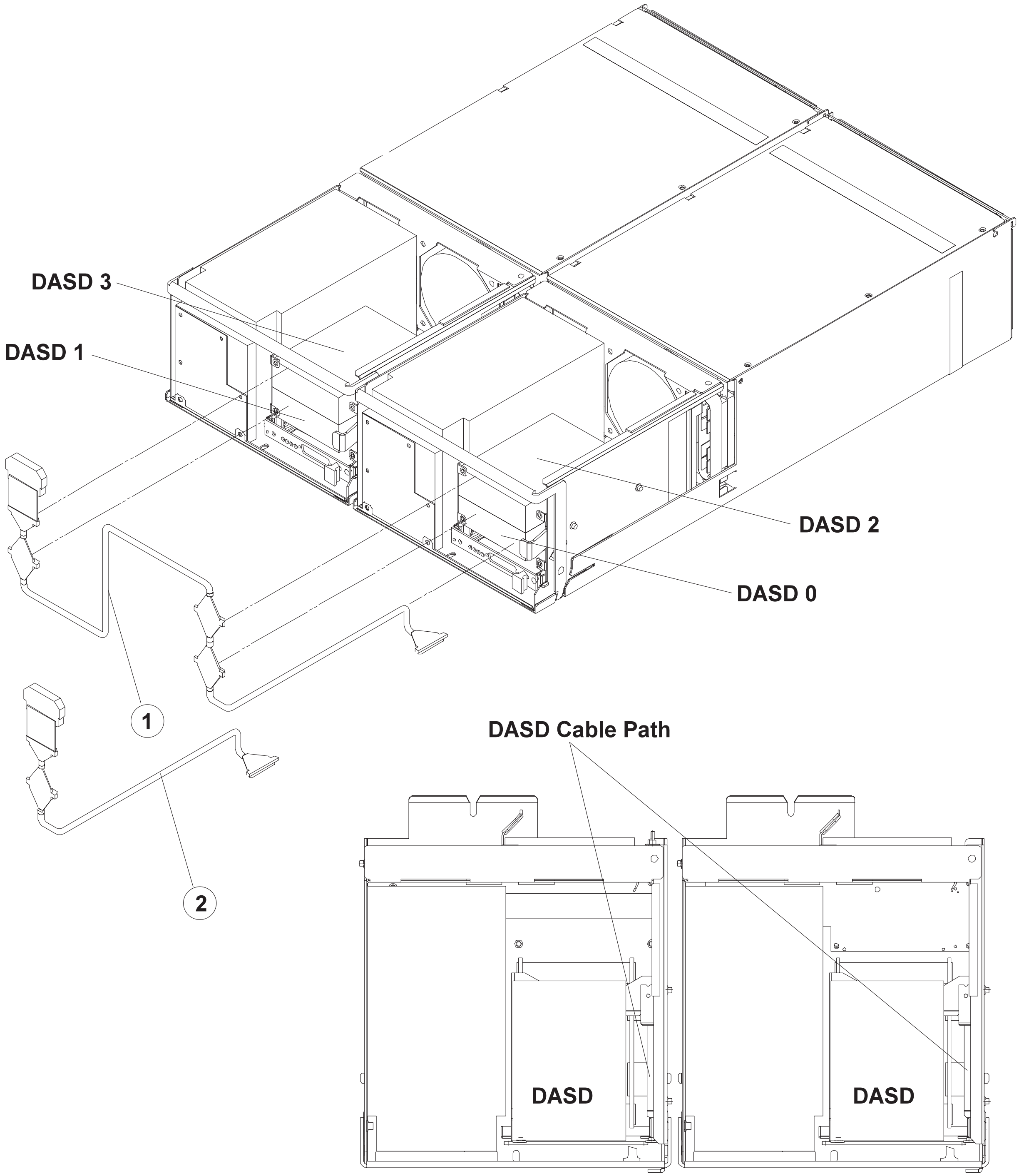
Asm– Index	Part Number	Units	Description
14–			POWER3 SMP Thin Node Assembly (F/C 2052/2056) (View 3) (reference only)
–1	03N4209	AR	• Cards, Memory (reference only)
–	93H4702	AR	• DIMM, 128 MB (See Table 5-4 on page 5-43.)
–	07L9030	AR	• DIMM, 256 MB (375 MHz POWER3 SMP Thin and Wide Nodes) (See Table 5-5 on page 5-43.)
–2	94H1261	2	• Cards, Processor (200 MHz POWER3 SMP Thin and Wide Nodes) (reference only)
–2	00P2187	2	• Cards, Processor (375 MHz POWER3 SMP Thin and Wide Nodes) (reference only)
–	31L8512	1	• Card, power sense (375 MHz POWER3 SMP Thin and Wide Nodes)
–3	78X8993	3	• Screw, M3x8
–4	31L7264	1	• Bracket Asm, Card Guide
–	84X4841	1	• • Nut, Hex
–5	11J5244	1	• Insulator
–6	31L7736	1	• Adapter, SP Switch MX2 (F/C 4023)
–7	11J3865	1	• Air Baffle
–	31L7253	AR	• Card, Dummy (not shown)
–	31L7827	1	• Block, keying 31L7827 is found only on early releases of the POWER3 SMP thin node.

Assembly 15: POWER3 SMP Wide Node asm (F/C 2053/2057) (view 1)



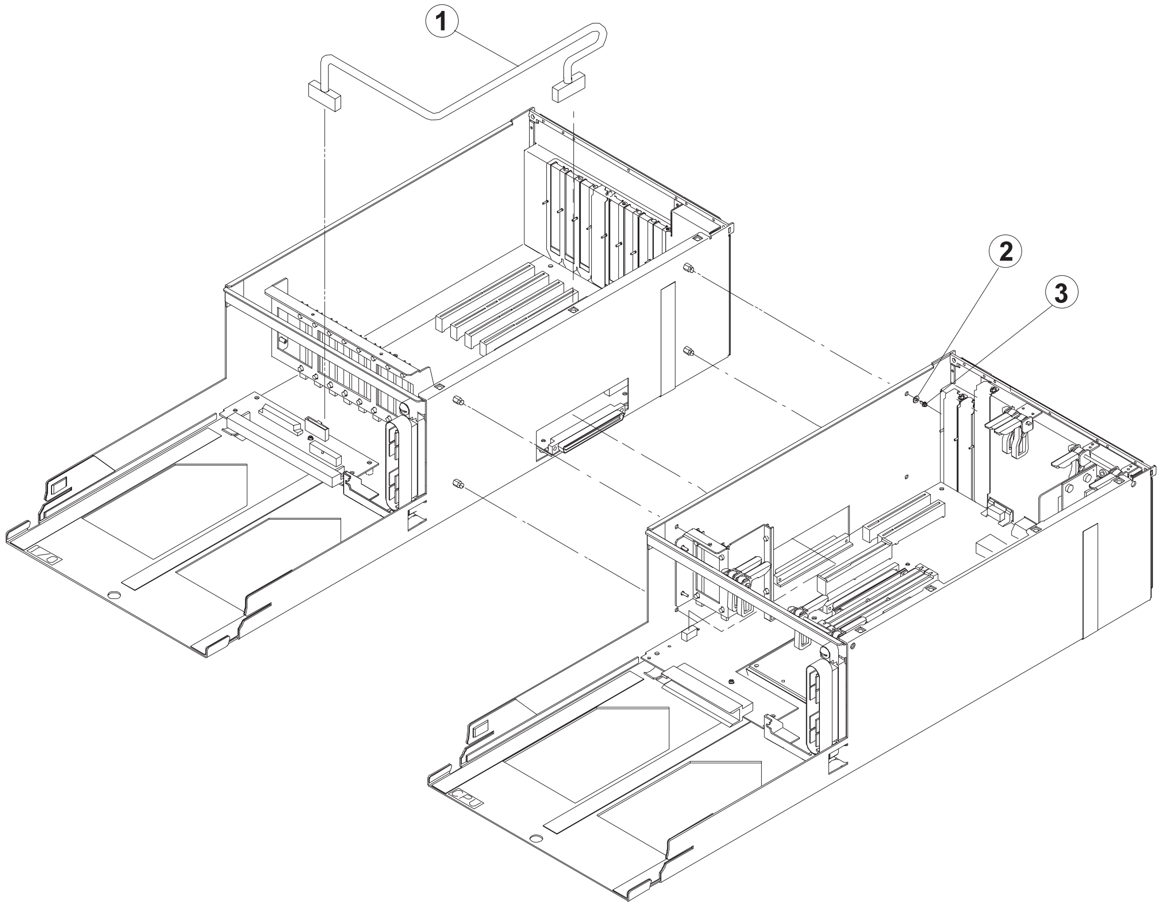
Asm–Index	Part Number	Units	Description
15–			POWER3 SMP Wide Node Assembly (F/C 2053/2057) (View 1) (reference only)
–1	21L3953	1	• Enclosure, POWER3 SMP Thin and Wide Node
–2	1624763	2	• • Screw
–3			• POWER3 SMP Thin Node (reference only)
–4	11J3884	1	• Panel Asm, Front
–5	17H5026	2	• • Screw
–6			• POWER3 SMP Wide Node I/O Expansion Asm (reference only)

Assembly 16: POWER3 SMP Wide Node asm (F/C 2053/2057) (view 2)



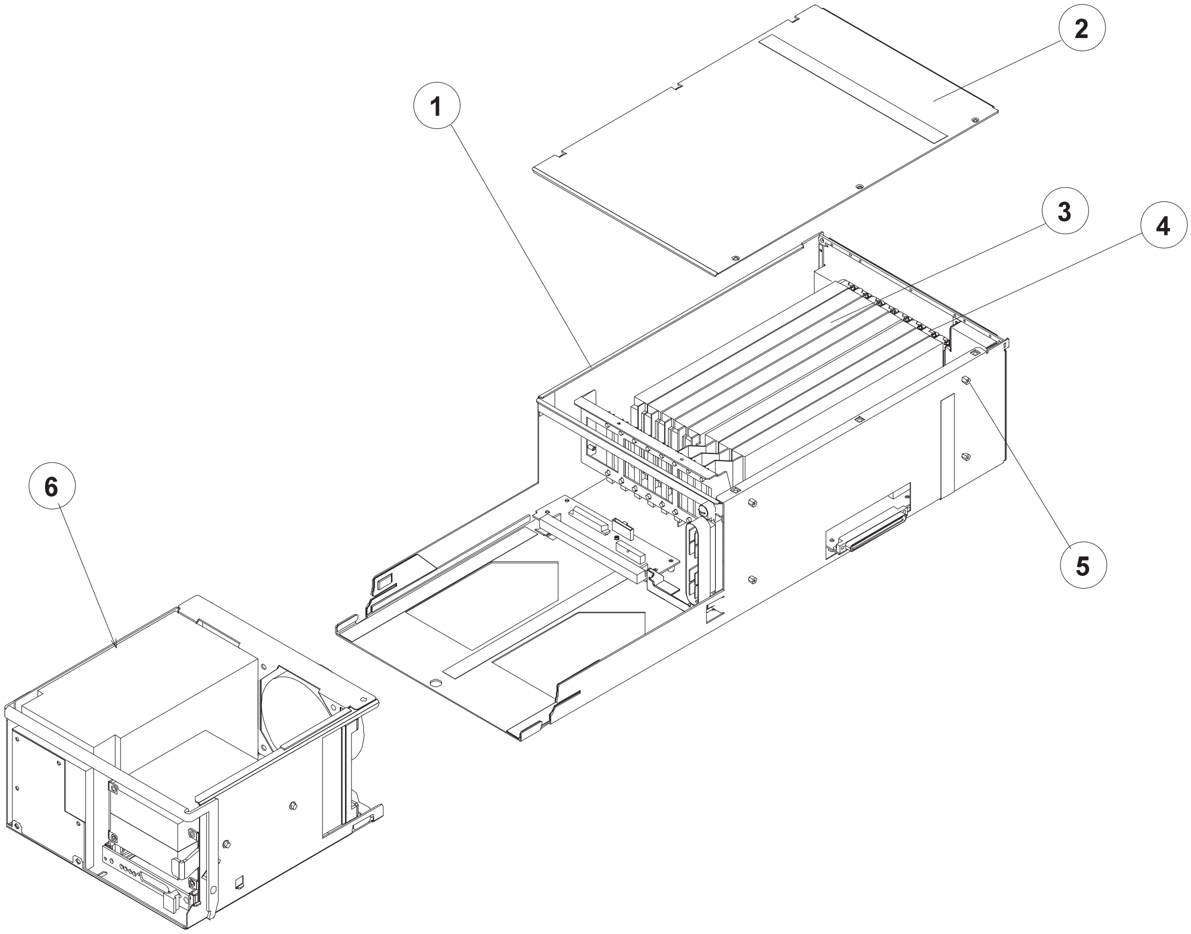
Asm– Index	Part Number	Units	Description
16–			POWER3 SMP Wide Node Assembly (F/C 2053/2057) (View 2) (reference only)
–1	11J5177	1	• SCSI Cable Asm, DASD, 4-Drop
–2	08J6105	AR	• SCSI Cable Asm, DASD, 2-Drop

Assembly 17: POWER3 SMP Wide Node asm (F/C 2053/2057) (view 3)



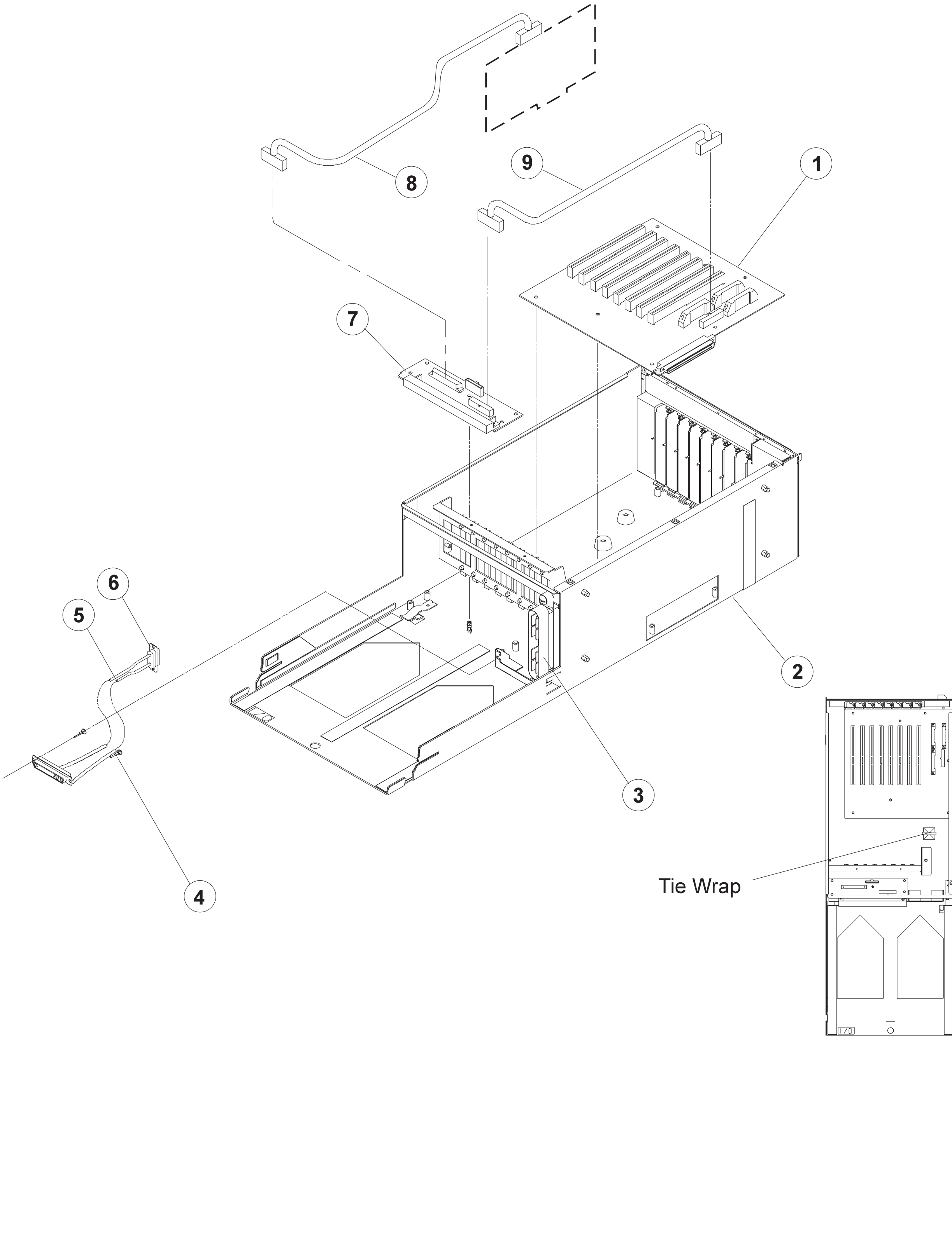
Asm–Index	Part Number	Units	Description
17–			POWER3 SMP Wide Node Assembly (F/C 2053/2057) (View 3) (reference only)
–1	51H9389	1	• Cable, I/O Expansion Control
–2	0418787	4	• Washer, Flat
–3	1624763	4	• Screw, M4x5

Assembly 18: POWER3 SMP Wide Node I/O Expansion asm (view 1)



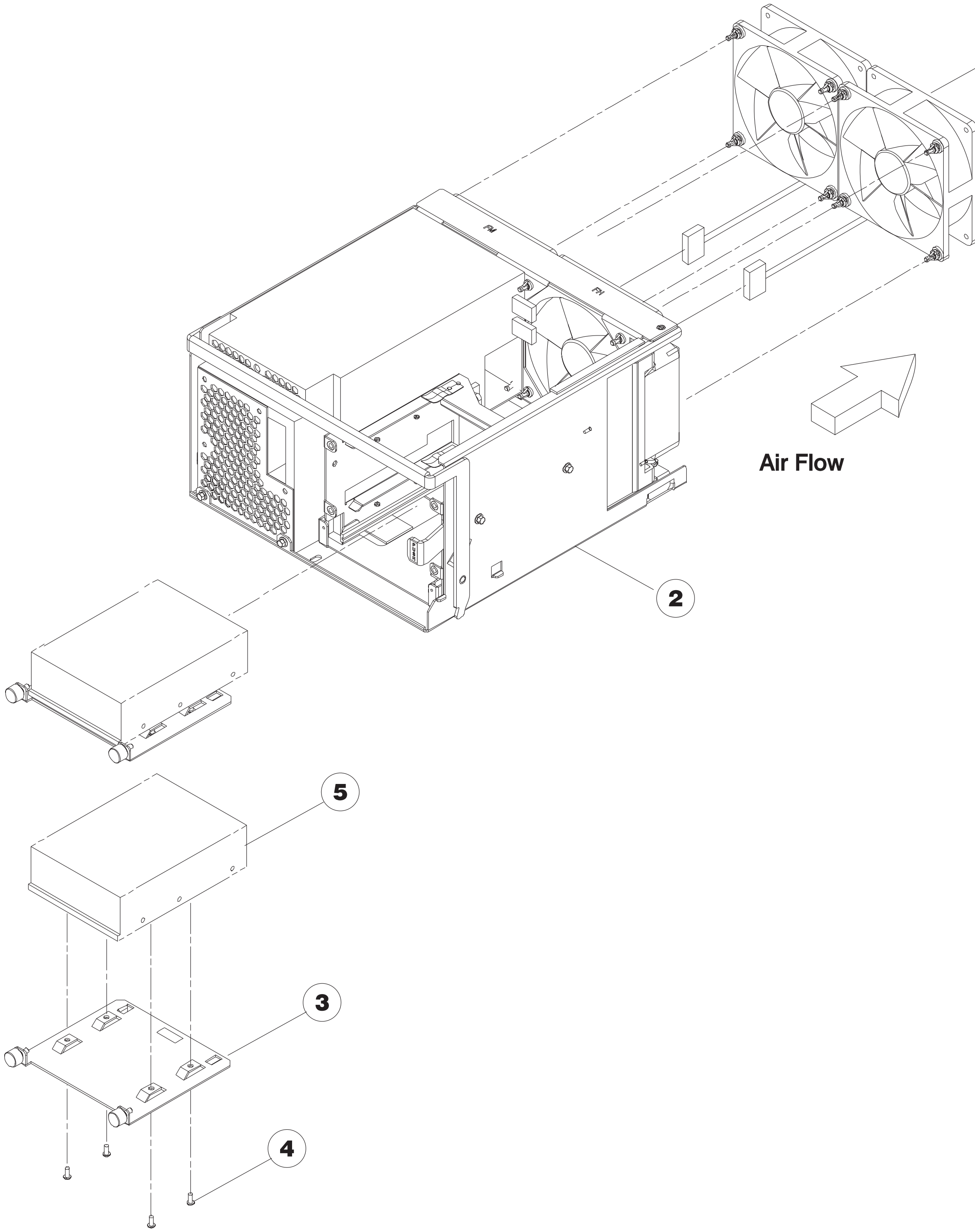
Asm–Index	Part Number	Units	Description
18–1			POWER3 SMP Wide Node I/O Expansion Assembly (View 1) (reference only)
–2	21L3046	1	• Cover Asm
–3		AR	• Cards, PCI (reference only)
–4	78X8993	8	• Screw, M3x8
–5	51H9412	4	• Standoff, Hex M4
–6	11J6524	1	• I/O Expansion Power Asm

Assembly 19: POWER3 SMP Wide Node I/O Expansion asm (view 2)



Asm– Index	Part Number	Units	Description
19–			POWER3 SMP Wide Node I/O Expansion Assembly (View 2) (reference only)
–1	07L8531	1	• Planar, PCI Expansion
–	1624766	7	• • Screw, M4x10
–2	21L3954	1	• Chassis Asm, I/O Expansion
–3	21L2888	1	• Cable Asm, PCI Power
–	21L2882	2	• • Screw, Shoulder
–4	51H9358	2	• Pin, Guide
–5	11J6147	1	• Cable Asm, Power
–6	51H8738	2	• • Standoff
–	1622316	2	• • Lock Washer
–7	46H9165	1	• Card, Interposer
–	1624766	4	• • Screw, M4x10
–8	08J6111	1	• Cable Asm (reference only), Alternate DASD Cabling (F/C 1241)
–9	51H9386	1	• Cable Asm, Interposer signal

Assembly 20: POWER3 SMP Wide Node I/O Expansion asm (view 3)



Asm– Index	Part Number	Units	Description
20–			POWER3 SMP Wide Node I/O Expansion Assembly (View 3) (reference only)
–1	11J6513	2	• Fan Asm, Med Spd
–2	11J6524	1	• I/O Power Asm
–3	11J3928	2	• DASD Sled Asm
–4	0055726	4	• Screw, 6-32
–5		AR	• DASD (reference only) (See “DASD part numbers” on page 5-42.)

DASD part numbers

Table 5-1. 332 MHz SMP Thin and Wide Node DASD part numbers

Feature code	Part number	Size (GB)	Type	Address jumper
2908	59H6926	9.1	Ultra SCSI	45G9800
2909 See note	59H6926	9.1	Ultra SCSI disk pair	45G9800
2918 See note	5986923	18.2	Ultra SCSI disk pair	45G9800
2900	83H7105	4.5	Ultra SCSI	45G9800
2904 See note	83H7105	4.5	Ultra SCSI disk pair	45G9800
3000	93G2970	4.5	Fast/Wide	45G9800
3010	93G2972	9.1	Fast/Wide	45G9800
9146	5986923	18.2	Ultra SCSI	45G9800

Note: Mirrored DASD

Table 5-2. 200 MHz and 375 MHz POWER3 SMP Thin and Wide Node DASD part numbers

Feature code	Part number	Size (GB)	Type	Address jumper
2900	83H7105	4.5	Ultra SCSI	45G9800
2904	83H7105	4.5	Ultra SCSI disk pair	45G9800
2908	59H6926	9.1	Ultra SCSI	45G9800
2909 See note 1	59H6926	9.1	Ultra SCSI disk pair	45G9800
2918 See note 1	5986923	18.2	Ultra SCSI disk pair	45G9800
3804 See note 1	34L7393	9.1	Ultra SCSI disk pair	
3810 See note 1	34L7391	18.2	Ultra SCSI disk pair	
3820 See notes 1 and 2	34L7389	36.4	Ultra SCSI disk pair	
9146	5986923	18.2	Ultra SCSI	45G9800

Notes:

1. Mirrored DASD
2. Available only for 375 MHz POWER3 SMP Wide Node I/O expansion assembly

RS/6000 SP memory part numbers

Table 5-3. Memory DIMMs/cards. **(For 332 MHz SMP Thin and Wide Nodes)**			
Description	**Number of DIMMs**	**Total capacity**	**FRU number**
Base Card	NA	24 DIMMs (12 pairs)	03N4173
128 MB DIMM	1	128 MB	93H4702

Table 5-4. Memory DIMMs/cards. **(For 200 MHz POWER3 SMP Thin and Wide Nodes)**			
Description	**Number of DIMMs**	**Total capacity**	**FRU number**
Base Card	NA	32 DIMMs (16 pairs)	03N4209
128 MB DIMM	1	128 MB	93H4702

Table 5-5. Memory DIMMs/cards. **(For 375 MHz POWER3 SMP Thin and Wide Nodes)**			
Description	**Number of DIMMs**	**Total capacity**	**FRU number**
Base Card	NA	32 DIMMs (16 pairs)	03N4209
128 MB DIMM	1	128 MB	93H4702
256 MB DIMM	1	256 MB	07L9030

Appendix A. Messages and codes

Error code to FRU index

The following lists pertain to 332 MHz SMP, 200 MHz POWER3 SMP, and 375 MHz POWER3 SMP Thin and Wide Nodes.

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.

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-50.

Error codes can be obtained from the Service Processor Previous Boot history, System Management Services error log, and System Online Diagnostics (diag):

- **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 "minimum configuration" MAP for this node type in Chapter 1, “Maintenance Analysis Procedures (MAPs)” on page 1-1.
- **Node Online Diagnostics, Problem Determination**
  1. At a node prompt (either from TTY or TN connection), enter **diag**
  2. Press **Enter** to continue, then:
     – Choose 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 and perform listed action

Attention: Some 48 V dc power cables to the processor nodes have in-line circuit breakers. Ensure that the in-line circuit breaker switch is off (0) before connecting or disconnecting 48 V dc power cables from the node.

Notes:

1. If more than eight digits are displayed in the operator panel, 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-50.
2. The 332 MHz Symmetric MultiProcessor (SMP) node contains a separate service processor card, the POWER3 SMP Thin and Wide node does not. The service processor component of the POWER3 SMP Thin and Wide 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 2-11 on page 2-11). 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.
   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 or service processor are 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 3-46.
6. Following successful repair of the processor node, go to the “End of call” MAP in *RS/6000 SP: System Service Guide*.

   If you replace FRUs and the problem is still not corrected, go to “332 MHz SMP Node minimum configuration” or “POWER3 SMP Thin and Wide Node minimum configuration” MAP in Chapter 1, “Maintenance Analysis Procedures (MAPs)” on page 1-1, unless otherwise indicated in the tables.

Section	Page
Firmware and service processor codes	A-2
Bus SRN to FRU reference table	A-34
Checkpoints	A-36
332 MHz SMP Thin and Wide Node AIX and physical location code reference table	A-51

Firmware and service processor codes

If you replace FRUs and the problem is still not corrected, go to “332 MHz SMP Node minimum configuration” or “POWER3 SMP Thin and Wide Node minimum configuration” MAP in Chapter 1, “Maintenance Analysis Procedures (MAPs)” on page 1-1.

Table A-1 (Page 1 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
203w0xyz	• w=loop number • x=0 missing link • y=port number • z=c for interconnect z=b missing link back z=E RIO de-configured	Check Cables, then Remote I/O.
20A80xxx	Remote initial program load (RIPL) error.	
20A80000	Insufficient information to boot.	Verify the IP address.
20A80001	Client IP address is already in use by other network device.	Change IP address.
20A80002	Cannot get gateway IP address.	Refer to "Checkpoints" on page A-36 table using code **E174**.
20A80003	Cannot get server hardware address.	Refer to "Checkpoints" on page A-36 table using code **E174**.
20A80004	Boot up failed.	Refer to "Checkpoints" on page A-36 table using code **E175**.
20A80005	File transmission (FTP) failed.	Check network connection, try again.
20A80006	Image too big. Ran out of available firmware memory resources loading boot image.	Verify boot server configuration.
20D00xxx	Unknown/Unrecognized device	
20D0000F	Self-test failed on device, no error/location code information available.	Check the System Management Services error log entry (see step 3 on page A-1) for this error code. The location code (if present) in the error log entry should identify the location of the failing device.
20D00010	Self-test failed on device, can't locate package.	Contact your service support representative for assistance.
20D00011	Cannot determine machine model.	The machine model is part of the system Vital Product Data (VPD). Perform corrective actions listed for errors 2BA00050, 2BA00051
20E00xxx	Security	
20E00000	Power on Password entry error.	The password has been entered incorrectly. Retry installing the password.
20E00001	Privileged-access password entry error.	The password has been entered incorrectly. Retry installing the password.
20E00002	Privileged-access password jumper not enabled.	The privileged-access password jumper is not in the correct position for password initial entry. Consult the system's User's Guide for jumper location and position.
20E00003	Power on Password must be set for Unattended mode.	Unattended mode requires the setting of the Power On password before it is enabled.
20E00004	Gold cap drained or needs replacement.	Replace I/O planar. (See notes on A-2.)

Table A-1 (Page 2 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.

Error Code	Description	Action / Possible Failing FRU
20E00005	EEPROM locked.	1. Turn off, then turn on the processor node 2. Replace the I/O planar (See notes on A-2)
20E00008	CMOS corrupted or tampering evident, CMOS initialized.	Check your machine for evidence of tampering. If no tampering evident: Replace I/O planar. (See notes on A-2.)
20E00009	Invalid password entered - system locked.	The password has been entered incorrectly 3 times. Turn off, then turn on the processor node, then enter the password correctly.
20E0000A	EEPROM lock problem.	If for privileged-access password install, is jumper in correct position? Consult the system's User's Guide for jumper location and position. 1. Power the node circuit breaker(s) off and then on, retry 2. Replace I/O planar. (See notes on A-2)
20E0000B	EEPROM write problem.	1. Power the node circuit breaker(s) off and then on, retry 2. Replace I/O planar. (See notes on A-2)
20E0000C	EEPROM read problem.	1. Power the node circuit breaker(s) off and then on, retry 2. Replace I/O planar. (See notes on A-2)
20E00017	Cold boot needed for password entry.	Turn off, turn on the processor node.
20EE0xxx	Informational	
20EE0003	IP parameter requires 3 dots "."	Enter valid IP parameter. Example: 000.000.000.000
20EE0004	Invalid IP parameter.	Enter valid (numeric) IP parameter. Example: 000.000.000.000
20EE0005	Invalid IP parameter (>255).	Enter valid (numeric) IP parameter in the range of 0 to 255. Example: 255.192.002.000
20EE0006	No SCSI controllers present.	The I/O planar should always have (at least) one integrated PCI SCSI controller; replace the I/O planar. (See notes on A-2.)
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 2. Replace I/O planar, (See notes on A-2)

Table A-1 (Page 3 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
20EE0009	Unable to communicate with the Service processor.	1. Replace the service processor card (332 MHz SMP node) 2. Replace I/O planar, (See notes on A-2) 3. Replace system planar
20EE000A	Pointer to the operating system found in non-volatile storage.	Values normally found in nonvolatile 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 nonvolatile storage information (drainage of the Gold cap). If you are running AIX, this information can be reconstructed by running the bootlist command specifying the device that the operating system is installed on. Please refer to your AIX documentation for the exact syntax and usage of the bootlist command. In order to boot the operating system so that the above mentioned values can be reconstructed, power the system down and power it back up again, this should cause the system to look for the operating system in the devices contained 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. 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 attempt to boot again.
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 attempt to boot again. If the System Management Services menus do not display valid SCSI devices which were previously available: 1. Ensure SCSI signal, SCSI terminator, and power cables are securely connected and not damaged 2. Replace the I/O planar. (See notes on A-2)

Table A-1 (Page 4 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.

Error Code	Description	Action / Possible Failing FRU
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
21A00001	Test Unit Ready failed - hardware error.	Refer to the notes in error code 21A000xxx. 1. Replace the SCSI device 2. Replace the SCSI cable 3. Replace the SCSI controller
21A00002	Test Unit Ready failed - sense data available.	Refer to the notes in error code 21A000xxx. 1. Replace the media (Removable media devices) 2. Replace the SCSI device
21A00003	Send Diagnostic failed.	Refer to the notes in error code 21A000xxx. Replace the SCSI device.
21A00004	Send Diagnostic failed - DevOfl cmd.	Refer to the notes in error code 21A000xxx. Replace the SCSI device.
21F20xxx	SCSI read/write optical.	Refer to 21A00xxx for a description and repair action for the xxx value.
22000001	Internal wrap test failed.	Replace adapter.
22001001	Internal wrap test failed.	Replace adapter.
22002001	Adapter failed to complete hardware initialization.	Replace adapter.
22010001	Adapter failed to complete hardware initialization.	Replace adapter.
22011001	Adapter failed to complete hardware initialization.	Replace adapter.
25000000	Memory controller failed.	Replace the system planar.
25010xxx	Flash update problem.	
25010003	Cannot open OPENPROM package.	Replace I/O planar. (See notes on A-2.)
25010004	Cannot find OPENPROM node.	Replace I/O planar. (See notes on A-2.)
25010006	System id does not match image system id.	Make sure correct and non-corrupted firmware file is used.
25010007	Image has bad CRC.	Make sure correct and non-corrupted firmware file is used.

Table A-1 (Page 5 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
25010008	Flash is write protected, update cancelled.	1. Power the node circuit breaker(s) off and then on, retry 2. Replace I/O planar. (See notes on A-2)
25010009	Flash module is unsupported or not recognized.	Make sure correct and non-corrupted firmware file is used.
2501000A	Flash write protected.	1. Power the node circuit breaker(s) off and then on, retry 2. Replace I/O planar. (See notes on A-2)
25A0xxx0	L2 Cache controller problem.	1. Replace the processor card 2. Replace the system planar See error code 2B2xxx22 for xxx definitions.
25A0xxx1	L2 Cache controller problem.	1. Replace the processor card 2. Replace the system planar See error code 2B2xxx22 for xxx definitions.
25A1xxx1	L2 SRAM failure	Replace the processor card See error code 2B2xxx22 for xxx definitions.
25A80xxx	NVRAM problems	**NVRAM problem resolution:** **Note:** The gold cap, which is charged by the supervisor bus, will maintain NVRAM data and RTC (clock) for about 5 days with the node disconnected from the supervisor bus. 1. Errors reported against NVRAM can be caused by low gold cap voltage and (more 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 re-established 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 re-configured. 2. **332 MHz SMP Node**: Verify that a jumper is installed on I/O planar J15 pins 2 and 3. Refer to Figure 2-11 on page 2-11. **POWER3 SMP Thin and Wide Node**: Verify that a jumper is installed on I/O planar J14 pins 2 and 3. Refer to Figure 2-20 on page 2-15. 3. If the error is persistent, replace the I/O planar. (See notes on A-2.)
25A80000	Initialization failed, device test failed.	Refer to "Action/Failing FRU" under error code 25A80xxx.
25A80001	Init-NVRAM invoked, ALL of NVRAM initialized.	Refer to "Action/Failing FRU" under error code 25A80xxx.

Table A-1 (Page 6 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.

Error Code	Description	Action / Possible Failing FRU
25A80002	Init-NVRAM invoked, some data partitions may have been preserved.	Refer to "Action/Failing FRU" under error code 25A80xxx.
25A80011	Data corruption detected, ALL of NVRAM initialized.	Refer to "Action/Failing FRU" under error code 25A80xxx.
25A80012	Data corruption detected, some data partitions may have been preserved.	Refer to "Action/Failing FRU" under error code 25A80xxx.
25A80100	NVRAM data validation check failed.	Turn off, turn on the processor node and retry the operation before replacing any system component. Refer to "Action/Failing FRU" under error code 25A80xxx.
25A80201	Unable to expand target partition while saving configuration variable.	Refer to "Action/Failing FRU" under error code 25A80xxx.
25A80202	Unable to expand target partition while writing error log entry.	Refer to "Action/Failing FRU" under error code 25A80xxx.
25A80203	Unable to expand target partition while writing VPD data.	Refer to "Action/Failing FRU" under error code 25A80xxx.
25A80210	Setenv/$Setenv parameter error - name contains a null character.	Refer to "Action/Failing FRU" under error code 25A80xxx.
25A80211	Setenv/$Setenv parameter error - value contains a null character.	Refer to "Action/Failing FRU" under error code 25A80xxx.

Table A-1 (Page 7 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.

Error Code	Description	Action / Possible Failing FRU
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 (using 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. 1. 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. a. Select the SCSI ID utility from the SMS menus. b. Verify the list of SCSI controllers/adapters. If the list is not correct, suspect a problem with the adapter(s) installed but not listed. c. Select the option to *Save* the configuration information. d. Restart the system. e. If the problem persists, boot the operating system and verify the SCSI bus IDs of any installed/available SCSI controllers (change as necessary), and restart the system. 2. Contact your service support representative for further assistance.
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.
25AA0xxx	EEPROM problems	**EEPROM problem resolution:** 1. Ensure that the EEPROM Security jumper is in the correct position if doing a privileged-access password install 2. Retry the operation 3. If retries do not solve the problem, replace the I/O planar. (See notes on A-2)
25AA0000	Unable to unlock EEPROM.	Refer to “Action/Failing FRU” under error code 25AA0xxx.
25AA0001	Read-Recv error.	Refer to “Action/Failing FRU” under error code 25AA0xxx.

Table A-1 (Page 8 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
25AA0002	Read-Trans error.	Refer to "Action/Failing FRU" under error code 25AA0xxx.
25AA0003	Write-enable error.	Refer to "Action/Failing FRU" under error code 25AA0xxx.
25AA0004	Write-recv error.	Refer to "Action/Failing FRU" under error code 25AA0xxx.
25AA0005	Write-disable error.	Refer to Action under error code 25AA0xxx.
25AA0006	Write-Trans error.	Refer to Action under error code 25AA0xxx.
25AA0007	Unable to lock EEPROM.	Refer to Action under error code 25AA0xxx.
25B00001	No memory modules detected in either memory card 1 or 2.	Replace memory card(s)
25B00002	Multiple memory modules failed memory test.	1. Replace memory card(s) 2. Replace system planar.
25Cyyxxx	Memory Card problems (Also see the following codes for exact match.)	See "Memory PD bits" on page A-34 for definition of "yy". Be sure to check second line of the LCD display for location codes. Refer to "332 MHz SMP Thin and Wide Node AIX and physical location code reference table" on page A-51 to decode P1-Mx.x, and "Location diagrams of the RS/6000 SP components" on page 2-3 for card and DIMM locations. Alternatively, you can use the location code obtained from the System Management Services Error Log utility (see step 3 on page A-1) to identify which memory module (or memory module pair) the error is reported against.
25Cyy001	Memory module is not supported.	Replace unsupported memory module. **Note:** Memory module must be replaced with a supported type memory module. If an unsupported memory module is replaced by the same unsupported type, the error does not go away. There may be 2 memory module related memory errors reported to indicate a memory module pair. One of the 2 indicated memory modules may be good, when replacing memory replace 1 memory module at a time, not both. See "Memory PD bits" on page A-34 for definition of "yy". Refer to "Action/Possible Failing FRU" for 25Cyyxxx for more information.

Table A-1 (Page 9 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
25Cyy002	Memory module fails memory test.	1. Replace memory module 2. Replace memory card 3. Replace the system planar See “Memory PD bits” on page A-34 for definition of "yy" Refer to “Action/Possible Failing FRU” for 25Cyyxxx for more information.
25Cyy003	PD bits are mis-matched or missing one memory module.	1. Make sure both memory modules in the pair are the same type 2. Replace system planar See “Memory PD bits” on page A-34 for definition of "yy" Refer to “Action/Possible Failing FRU” for 25Cyyxxx for more information.
25Cyy004	Memory modules are disabled.	Remove this unused memory module. Refer to “Action/Possible Failing FRU” for 25Cyyxxx for more information. **Note:** If more than 3GB memory is installed in a 332 MHz SMP node, this error will occur.
25Cyy005	Memory module failed address test.	1. Replace memory module 2. Replace memory card 3. Replace system planar 4. Replace processor card See “Memory PD bits” on page A-34 for definition of "yy" Refer to “Action/Possible Failing FRU” for 25Cyyxxx for more information.
25Cyy006	Memory module failed inter-extent test.	1. Replace memory module 2. Replace memory card 3. Replace system planar 4. Replace processor card See “Memory PD bits” on page A-34 for definition of "yy" Refer to “Action/Possible Failing FRU” for 25Cyyxxx for more information.
25Cyy007	Memory module failed extent access test.	1. Replace memory module 2. Replace memory card 3. Replace system planar 4. Replace processor card See “Memory PD bits” on page A-34 for definition of "yy" Refer to “Action/Possible Failing FRU” for 25Cyyxxx for more information.

Table A-1 (Page 10 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
25Cyy008	Memory module has been deconfigured	Replace memory module. See "Memory PD bits" on page A-34 for definition of "yy".
26020001	Invalid PCI adapter vendor ID	1. Move adapter to another slot (behind a different PCI bridge) 2. Check for available firmware updates for adapter. Apply if available 3. Run AIX diagnostics on adapter 4. Replace adapter 5. Check for system firmware updates. Apply if available 6. Replace power supply FRU 7. Replace I/O planar
26020002	Invalid PCI adapter device ID.	1. Move adapter to another slot (behind a different PCI bridge) 2. Check for available firmware updates for adapter. Apply if available 3. Run AIX diagnostics on adapter 4. Replace adapter 5. Check for system firmware updates. Apply if available 6. Replace power supply FRU 7. Replace I/O planar
26020003	Invalid PCI adapter class code.	1. Move adapter to another slot (behind a different PCI bridge) 2. Check for available firmware updates for adapter. Apply if available 3. Run AIX diagnostics on adapter 4. Replace adapter 5. Check for system firmware updates. Apply if available 6. Replace power supply FRU 7. Replace I/O planar
26020007	Failed to allocate bus resources to PCI adapter.	1. Move adapter to another slot (behind a different PCI bridge) 2. Check for available firmware updates for adapter. Apply if available. 3. Run AIX diagnostics on adapter 4. Replace adapter 5. Check for system firmware updates. Apply if available 6. Replace power supply FRU 7. Replace I/O planar
26800Cxx	Machine check occurred.	If the location code shown on LCD identifies a PCI adapter slot: 1. Replace the adapter in the slot identified 2. Replace I/O planar If the location code does not identify a PCI adapter slot, or if there is no location code: Replace I/O planar.

Table A-1 (Page 11 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
26800Dxx	Machine check occurred, unable to isolate to a single device.	The "xx" indicates the PCI bus number with the error. 1. Attempt to reboot the system in Service Mode, this preserves the AIX error log. If the reboot fails, attempt to reboot CD-ROM. If the reboot is successful, run Diagnostics in Problem Determination mode to determine the cause of failure. Otherwise continue. 2. Refer to "Bus SRN to FRU reference table" on page A-34 using PCI Bus "xx" for isolation of the failing device
28030xxx	Real-Time Clock (RTC) errors (Also see the following codes for exact match.)	**Note:** The gold cap, which is charged by the supervisor bus, will maintain NVRAM data and RTC (clock) for about 5 days with the node disconnected from the supervisor bus. 1. Errors reported against the Real Time Clock (RTC) can be caused by low gold cap voltage and (more rarely) power outages that occur during normal system usage. These errors are warnings that the RTC data content needs to be re-established and do not require any FRU replacement unless the error is persistent. When one of these errors occurs, the Power On Password and Time and Date information has been lost. • To set/restore a Power-On Password, use the System Management Services utility • To set/restore the Time and Date, use the operating system facility 2. **332 MHz SMP Node**: Verify that a jumper is installed on I/O planar J15 pins 2 and 3. Refer to Figure 2-11 on page 2-11. **POWER3 SMP Thin and Wide Node**: Verify that a jumper is installed on I/O planar J14 pins 2 and 3. Refer to Figure 2-20 on page 2-15. 3. If the error is persistent, replace the I/O planar. (See notes on A-2)
28030001	RTC initialization required- RTC not updating, corrected.	Refer to "Action/Failing FRU" under error code 28030xxx.
28030002	Bad time/date values	1. Set the time and date 2. Refer to "Action/Failing FRU" under error code 28030xxx
28030003	RTC initialization required - RTC not updating, not corrected	Replace the I/O planar. (See notes on A-2.)

Table A-1 (Page 12 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
28030004	RTC operating mode parameters changed (for example, data format)	1. Set/restore the time and date 2. Refer to "Action/Failing FRU" under error code 28030xxx
28030005	RTC battery (gold cap) error	1. Replace the I/O planar. (See notes on A-2.) 2. Refer to "Action/Failing FRU" under error code 28030xxx
28030006	Processor frequency measurement error	1. Verify the current level of system firmware is installed. 2. Replace processor card 3. Replace the I/O planar. (See notes on A-2.)
29000002	Super I/O sub-device 1,0 controller failed self-test.	
2B200402	Unsupported processor.	Replace the processor card.
2B2xxx11	Processor is manually disabled.	Use service processor menus to re-enable the processor and reboot the system. See error code 2B2xxx22 for definitions of xxx.
2B2xxx22	Processor disabled.	Replace the processor card. Where xxx indicates the processor type as follows: **451** 332 MHz 1 way processor card **461** 332 MHz 2 way processor card **4A1** 332 MHz 2 way processor card **654** POWER3 SMP 1–way processor card **768** 375 MHz POWER3 SMP 2–way processor card
2B2xxx31	Processor card failed	Replace processor card See error code 2B2xxx22 for xxx definitions.
2B2xxx42	Unsupported processor type	Replace processor card See error code 2B2xxx22 for xxx definitions.
2BA00xxx	Service processor	
2BA00000	Service processor POST failure.	1. Power off the node circuit breaker(s) and wait until the power LEDs are off 2. Power on the node circuit breaker(s), retry the operation 3. Replace the service processor card (332 MHz SMP node) 4. Replace the I/O planar. (See notes on A-2)
2BA00012	Service processor reports self-test failure.	1. Power off the node circuit breaker(s) and wait until the power LEDs are off 2. Power on the node circuit breaker(s), retry the operation 3. Replace the service processor card (332 MHz SMP node) 4. Replace the I/O planar. (See notes on A-2)
2BA00013	Service processor reports bad NVRAM CRC.	Refer to "Action/Failing FRU" under error code 25A80xxx.

Table A-1 (Page 13 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
2BA00014	Service processor reports bad service processor firmware.	Re-program the system firmware. See "Service processor flash EPROM updates (and system firmware)" on page 3-46 for flash EPROM and firmware update procedures.
2BA00017	Service processor reports bad or low battery.	1. Refer to "Action/Failing FRU" under error code 25A80xxx 2. If problem persists, replace the service processor
2BA00018	EPOW test failure.	1. Replace the service processor card (332 MHz SMP node) 2. Replace the I/O planar. (See notes on A-2)
2BA00019	IRQ13 test failure.	1. Replace the I/O planar. (See notes on A-2) 2. Replace the service processor card (332 MHz SMP node)
2BA00024	Service processor reports bad power controller firmware.	Re-program the system firmware. See "Service processor flash EPROM updates (and system firmware)" on page 3-46 for flash EPROM and firmware update procedures.
2BA00040	Service processor reports service processor VPD module not present.	1. Re-program the service processor firmware. See "Service processor flash EPROM updates (and system firmware)" on page 3-46 for flash EPROM and firmware update procedures 2. Replace the service processor card (332 MHz SMP node)
2BA00041	Service processor VPD is corrupted.	1. Re-program the service processor firmware. See "Service processor flash EPROM updates (and system firmware)" on page 3-46 for flash EPROM and firmware update procedures 2. Replace the service processor card (332 MHz SMP node)
2BA00050	Service processor reports system VPD module not present or not recognizable.	Replace the I/O planar. **Note:** Do not swap the old VPD module from the old I/O planar to the new one. See notes on A-2.
2BA00051	System VPD data corrupted.	Replace the I/O planar. **Note:** Do not swap the old VPD module from the old I/O planar to the new one. See notes on A-2.
2BA00052	Service processor reports node supervisor VPD data corrupted.	Replace node supervisor card.
2BA00053	Service processor reports node supervisor VPD module not present.	Replace node supervisor card.
2BA00060	Service processor reports I/O planar VPD module not present.	Replace the I/O planar. (See notes on A-2.)

Table A-1 (Page 14 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.

Error Code	Description	Action / Possible Failing FRU
2BA00061	Service processor reports I/O planar VPD data corrupted.	Replace the I/O planar. (See notes on A-2.)
2BA00062	Service processor reports system planar VPD module not present.	Replace the system planar.
2BA00063	Service processor reports system planar VPD data corrupted.	Replace the system planar.
2BA00064	Service processor reports PCI riser card VPD module not present.	1. Make sure firmware level is up to date 2. Replace the PCI riser card (332 MHz SMP node)
2BA00065	Service processor reports PCI riser card VPD data corrupted.	Replace the PCI riser card (332 MHz SMP node).
2BA00066	Service processor reports PCI expansion planar VPD module not present.	1. Replace PCI expansion planar. 2. Replace I/O expansion interposer card.
2BA00067	Service processor reports PCI expansion planar VPD data corrupted.	1. Replace PCI expansion planar. 2. Replace I/O expansion interposer card.
2BA00070	Service processor reports processor card VPD module not present.	Replace the processor card(s).
2BA00071	VPD data corrupted for processor card in slot 1.	Replace the processor card in slot 1.
2BA00073	VPD data corrupted for processor card in slot 2.	Replace the processor card in slot 2.
2BA00080	Service processor reports memory card VPD module not present.	Replace the memory card(s).
2BA00081	VPD data corrupted for memory card in slot 0.	Replace the memory card in slot 0.
2BA00083	VPD data corrupted for memory card in slot 1.	Replace the memory card in slot 1.
2BA00101	Service processor is not installed, update cancelled.	1. Install the service processor 2. Retry operation
2BA00103	Service processor firmware update file is corrupted, update cancelled.	1. Obtain new service processor firmware 2. Retry operation
2BA00104	Service processor firmware update file is the same level as the service processor firmware, update cancelled.	1. Obtain new level of service processor firmware 2. Retry operation
2BA00200	Service processor firmware update error occurred, update not completed. Error occurred during service processor flash write operation.	Service processor firmware update error recovery procedure: 1. Turn the system Off 2. Turn the system On 3. Retry operation. If problem persists, replace service processor card (332 MHz SMP node)
2BA00201	Service processor firmware update error occurred, update not completed. Error occurred while reading service processor CRC.	See error code 2BA00200 for recovery procedure.

Table A-1 (Page 15 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.

Error Code	Description	Action / Possible Failing FRU
2BA00202	Service processor firmware update error occurred, update not completed. Error occurred while verifying service processor CRC.	See error code 2BA00200 for recovery procedure.
2BA00203	Service processor firmware update error occurred, update not completed. Error occurred while reading new service processor CRC after updating service processor firmware.	See error code 2BA00200 for recovery procedure.
2BA00204	Service processor firmware update error occurred, update not completed. Error occurred while calculate CRC write.	See error code 2BA00200 for recovery procedure.
2BA00300	Service processor reports slow fan 1.	1. Replace fan 1 2. If problem persists, replace CPU power supply FRU 3. Replace I/O planar. (See notes on A-2)
2BA00301	Service processor reports slow fan 2.	1. Replace fan 2 2. If problem persists, replace CPU power supply FRU 3. Replace I/O planar. (See notes on A-2)
2BA00302	Service processor reports slow fan 3.	1. Replace fan 3 2. If problem persists, replace I/O power supply FRU 3. Replace I/O planar. (See notes on A-2)
2BA00303	Service processor reports slow fan 4.	1. Replace fan 4 2. If problem persists, replace I/O power supply FRU 3. Replace I/O planar. (See notes on A-2)
2BA00309	Service processor reports generic cooling alert.	1. Check for cool air flow obstructions to the system 2. Read the Service Processor Error Logs. Perform “Read Service Processor Error Logs” in Service processor menus. If various temperature faults (402xxxxx and 2BA003xx) are logged, replace the service processor card (332 MHz SMP node). 3. Replace I/O planar. (See notes on A-2)
2BA00310	Service processor reports CPU over temperature alert.	1. Check for cool air flow obstructions to the system 2. Read the Service Processor Error Logs. Perform “Read Service Processor Error Logs” in Service processor menus. If various temperature faults (402xxxxx and 2BA003xx) are logged, replace the service processor card (332 MHz SMP node). 3. If the problem persists, replace processor card

Table A-1 (Page 16 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.

Error Code	Description	Action / Possible Failing FRU
2BA00311	Service processor reports I/O over temperature alert.	1. Check for cool air flow obstructions to the system 2. Read the Service Processor Error Logs. Perform “Read Service Processor Error Logs” in Service processor menus. If various temperature faults (402xxxxx and 2BA003xx) are logged, replace the service processor card (332 MHz SMP node). 3. Replace I/O planar. (See notes on A-2)
2BA00312	Service processor reports memory over temperature alert.	1. Check for cool air flow obstructions to the system 2. Read the Service Processor Error Logs. Perform “Read Service Processor Error Logs” in Service processor menus. If various temperature faults (402xxxxx and 2BA003xx) are logged, replace the service processor card. 3. Replace Memory card
2BA00313	Service processor reports generic power alert.	1. Replace power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00314	Service processor reports 5V over voltage alert.	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00315	Service processor reports 5V under voltage alert.	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00316	Service processor reports 3.3V over voltage alert.	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00317	Service processor reports 3.3V under voltage alert.	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00318	Service processor reports 2.5V over voltage alert.	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00319	Service processor reports 2.5V under voltage alert.	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00320	Service processor reports +12V over voltage alert.	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00321	Service processor reports +12V under voltage alert.	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00322	Service processor reports -12V over voltage alert.	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00323	Service processor reports -12V under voltage alert.	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00324	Service processor reports 5V standby over voltage alert.	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00325	Service processor reports 5V standby under voltage alert.	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00326	Service processor reports PCI expansion planar 5V over voltage alert.	1. Replace I/O power supply FRU 2. Replace I/O planar. (See notes on A-2)

Table A-1 (Page 17 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
2BA00327	Service processor reports PCI expansion planar 5V under voltage alert.	1. Replace I/O power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00328	Service processor reports PCI expansion planar 3.3V over voltage alert.	1. Replace I/O power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00329	Service processor reports PCI expansion planar 3.3V under voltage alert.	1. Replace I/O power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00330	Service processor reports PCI expansion planar +12V over voltage alert.	1. Replace I/O power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00331	Service processor reports PCI expansion planar +12V under voltage alert.	1. Replace I/O power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00332	Service processor reports PCI expansion planar -12V over voltage alert.	1. Replace I/O power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00333	Service processor reports PCI expansion planar -12V under voltage alert.	1. Replace I/O power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00334	Service processor reports generic slow shutdown request.	1. Replace power supply FRU 2. Replace I/O planar. (See notes on A-2) 3. Read the Service Processor Error Logs. Perform "Read Service Processor Error Logs" in Service processor menus. If various temperature faults (402xxxxx and 2BA003xx) are logged, replace the service processor card (332 MHz SMP node).
2BA00335	Service processor reports CPU critical over temperature slow shutdown request.	1. Check for cool air flow obstructions to the system 2. Check fans for obstructions that prevent them from normal operation (example: a cable caught in the fan preventing it from spinning) 3. Read the Service Processor Error Logs. Perform "Read Service Processor Error Logs" in Service processor menus. If various temperature faults (402xxxxx and 2BA003xx) are logged, replace the service processor card (332 MHz SMP node). 4. If problem persists, replace processor card
2BA00336	Service processor reports I/O critical over temperature slow shutdown request.	1. Check for cool air flow obstructions to the system 2. Check fans for obstructions that prevent them from normal operation (example: a cable caught in the fan preventing it from spinning) 3. If problem persists, replace I/O planar. (See notes on A-2) 4. Read the Service Processor Error Logs. Perform "Read Service Processor Error Logs" in Service processor menus. If various temperature faults (402xxxxx and 2BA003xx) are logged, replace the service processor card (332 MHz SMP node)

Table A-1 (Page 18 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
2BA00337	Service processor reports memory critical over temperature slow Shutdown request.	1. Check for cool air flow obstructions to the system 2. Check fans for obstructions that prevent them from normal operation (example: a cable caught in the fan preventing it from spinning) 3. If problem persists, replace memory card 4. Read the Service Processor Error Logs. Perform “Read Service Processor Error Logs” in Service processor menus. If various temperature faults (402xxxxx and 2BA003xx) are logged, replace the service processor card (332 MHz SMP node)
2BA00338	Service processor reports generic fast shutdown request.	1. Replace power supply FRU 2. Replace I/O planar. (See notes on A-2) 3. Read the Service Processor Error Logs. Perform “Read Service Processor Error Logs” in Service processor menus. If various temperature faults (402xxxxx and 2BA003xx) are logged, replace the service processor card (332 MHz SMP node)
2BA00340	Service processor reports locked fan - fast shutdown request fan 1.	1. Replace fan 1 2. If problem persists, replace CPU power supply FRU 3. Replace I/O planar. (See notes on A-2)
2BA00341	Service processor reports locked fan - fast shutdown request fan 2.	1. Replace fan 2 2. If problem persists, replace CPU power supply FRU 3. Replace I/O planar. (See notes on A-2)
2BA00342	Service processor reports locked fan - fast shutdown request fan 3.	1. Replace fan 3 2. If problem persists, replace I/O power supply FRU 3. Replace I/O planar. (See notes on A-2)
2BA00343	Service processor reports locked fan - fast shutdown request fan 4.	1. Replace fan 4 2. If problem persists, replace I/O power supply FRU 3. Replace I/O planar. (See notes on A-2)
2BA00350	Service processor reports generic immediate shutdown request.	1. Replace power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00351	Service processor reports generic power loss EPOW.	1. Replace power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00352	Service processor reports loss of power (frame).	1. Replace power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00353	Service processor reports loss of power (power button).	1. Replace power supply FRU 2. Replace I/O planar. (See notes on A-2)
2BA00360	Service processor reports slow fan 1.	1. Replace fan 1 2. If problem persists, replace power supply FRU 3. Replace I/O planar. (See notes on A-2)

Table A-1 (Page 19 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
2BA00361	Service processor reports slow fan 2.	1. Replace fan 2 2. If problem persists, replace power supply FRU 3. Replace I/O planar. (See notes on A-2)
2BA00362	Service processor reports slow fan 3.	1. Replace fan 3 2. If problem persists, replace power supply FRU 3. Replace I/O planar. (See notes on A-2)
2BA00363	Service processor reports slow fan 4.	1. Replace fan 4 2. If problem persists, replace power supply FRU 3. Replace I/O planar. (See notes on A-2)
2BA00364	Service processor reports locked fan 1.	1. Remove obstruction from fan 1 2. Replace fan 1 3. If problem persists, replace power supply FRU 4. Replace I/O planar. (See notes on A-2)
2BA00365	Service processor reports locked fan 2.	1. Remove obstruction from fan 2 2. Replace fan 2 3. If problem persists, replace power supply FRU 4. Replace I/O planar. (See notes on A-2)
2BA00366	Service processor reports locked fan 3.	1. Remove obstruction from fan 3 2. Replace fan 3 3. If problem persists, replace power supply FRU 4. Replace I/O planar. (See notes on A-2)
2BA00367	Service processor reports locked fan 4.	1. Remove obstruction from fan 4 2. Replace fan 4 3. If problem persists, replace power supply FRU 4. Replace I/O planar. (See notes on A-2)
2BA00368	Service processor reports slow fan 1.	1. Replace fan 1 2. If problem persists, replace power supply FRU 3. Replace I/O planar. (See notes on A-2)
2BA00369	Service processor reports slow fan 2.	1. Replace fan 2 2. If problem persists, replace power supply FRU 3. Replace I/O planar. (See notes on A-2)
2BA00370	Service processor reports slow fan 3.	1. Replace fan 3 2. If problem persists, replace power supply FRU 3. Replace I/O planar. (See notes on A-2)
2BA00371	Service processor reports locked fan 1.	1. Remove obstruction from fan 1 2. Replace fan 1 3. If problem persists, replace power supply FRU 4. Replace I/O planar. (See notes on A-2)

Table A-1 (Page 20 of 20). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
2BA00372	Service processor reports locked fan 2.	1. Remove obstruction from fan 2 2. Replace fan 2 3. If problem persists, replace power supply FRU 4. Replace I/O planar. (See notes on A-2)
2BA00373	Service processor reports locked fan 3.	1. Remove obstruction from fan 3 2. Replace fan 3 3. If problem persists, replace power supply FRU 4. Replace I/O planar. (See notes on A-2)
2BA00374	Service processor reports power supply 1 and fans failed.	1. Replace CPU power supply FRU 2. Replace I/O planar (See notes on A-2)
2BA00375	Service processor reports power supply 2 and fans failed.	1. Replace I/O power supply FRU 2. Replace I/O planar (See notes on A-2)
2BA00376	Service processor reports power supply failure.	1. Replace failing power supply FRU 2. Replace I/O planar (See notes on A-2)
2BA00399	Service processor reports unsupported value in EPOW.	Replace I/O planar. (See notes on A-2)

Table A-2 (Page 1 of 13). Service processor error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
40100005	A loss of system power detected.	Possible 48V power loss. If not, replace power supply FRU
40100007	Immediate shutdown.	Possible 48V power loss. If not, replace power supply FRU
40110001	Power supply fail.	1. Power supply FRU 2. I/O planar. (See notes on A-2) 3. Service processor 4. Possible problem with DASD power 5. Possible problem with CPU card 6. System planar 7. Power cables to system planar
40110002	Voltage is present, but not detected on both processor cards.	1. Check power interlock tab on CPU power supply FRU 2. Check power cable at processor card(s) for proper seating (332 MHz SMP node) 3. Check power cable at system planar for proper seating (POWER3 SMP node) 4. Replace CPU power supply FRU 5. Replace system planar power cable assembly
40110003	Voltage is present, but not detected on one processor card. (If the system is running, refer to the AIX error log to find out which processor card is failing. If the system is not running, refer to the service processor error log.)	1. Check power interlock tab on CPU power supply FRU 2. Check power cable at processor card(s) for proper seating (332 MHz SMP node) 3. Check power cable at system planar for proper seating (POWER3 SMP node) 4. Replace failing processor card 5. Replace planar power cable assembly

Error Code	Description	Action / Possible Failing FRU
40110012	Voltage not found on I/O expansion planar	1. Check power interlock tab on I/O expansion power supply FRU 2. Check power cable at I/O expansion planar for proper seating. 3. Check interposer signal cable. 4. Check I/O expansion control cable. 5. Replace power supply. 6. Replace I/O expansion planar. 7. Replace I/O expansion control cable, I/O expansion power cable, and interposer signal cable assemblies. 8. Replace interposer card.
40111002	An unknown power problem detected.	1. Replace power supply FRU 2. Replace I/O planar. (See notes on A-2)
40111022	A high 5.0 voltage reading detected.	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
40111032	A high 3.3 voltage reading detected.	1. Replace processor card 2. Replace CPU (or I/O) power supply FRU
40111033	A high 2.5 voltage reading detected.	1. Replace processor card 2. Replace CPU power supply FRU
40111052	A high +12 voltage reading detected.	1. Replace CPU (or I/O) power supply FRU 2. Replace I/O planar. (See notes on A-2)
40111062	A high −12 voltage reading detected.	1. Replace CPU (or I/O) power supply FRU 2. Replace I/O planar. (See notes on A-2)
40111072	A high +5 standby voltage reading detected.	1. Replace processor card 2. Replace CPU (or I/O) power supply FRU
40111082	A low 5.0 voltage reading detected.	1. Replace CPU (or I/O) power supply FRU 2. Replace processor card
40111092	A low 3.3 voltage reading detected.	1. Replace processor card 2. Replace CPU (or I/O) power supply FRU
40111093	A low 2.5 voltage reading detected.	1. Replace CPU power supply FRU 2. Replace processor card
401110B2	A low +12 voltage reading detected.	1. Replace CPU (or I/O) power supply FRU 2. Replace I/O planar. (See notes on A-2)
401110C2	A low −12 voltage reading detected.	1. Replace CPU (or I/O) power supply FRU 2. Replace I/O planar. (See notes on A-2)
401110D2	A low +5 standby voltage reading detected.	1. Replace processor card 2. Replace CPU (or I/O) power supply FRU
40111101	Power good signal low on either processor cards. (If the system is running, refer to the AIX error log to find out which processor card is failing. If the system is not running, refer to the service processor error log.)	1. Check power cable at processor card(s) 2. Replace failing processor card 3. Replace planar power cable assembly
40111102	Wrong processor cards plugged into the system.	1. Remove cards 2. Verify part numbers 3. Install valid cards

Table A-2 (Page 2 of 13). Service processor error codes.

Table A-2 (Page 3 of 13). Service processor error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
40111103	Real CPU 5-volt fail.	1. Remove CPU cards 2. Verify part numbers 3. Install valid cards
40111122	A PCI high 5.0 voltage reading detected	1. Replace Power Supply 2. Replace expansion I/O planar. (See notes on A-2)
40111132	A PCI high 3.3 voltage reading detected	1. Replace Power Supply 2. Replace expansion I/O planar. (See notes on A-2)
40111152	A PCI high +12 voltage reading detected	1. Replace Power Supply 2. Replace expansion I/O planar. (See notes on A-2)
40111162	A PCI high -12 voltage reading detected	1. Replace Power Supply 2. Replace expansion I/O planar. (See notes on A-2)
40111182	A PCI low 5.0 voltage reading detected	1. Replace Power Supply 2. Replace expansion I/O planar. (See notes on A-2)
40111192	A PCI low 3.3 voltage reading detected	1. Replace Power Supply 2. Replace expansion I/O planar. (See notes on A-2)
401111B2	A PCI low +12 voltage reading detected	1. Replace Power Supply 2. Replace expansion I/O planar. (See notes on A-2)
401111C2	A PCI low -12 voltage reading detected	1. Replace Power Supply 2. Replace expansion I/O planar. (See notes on A-2)
40112022	A high 5.0 voltage reading detected	1. Replace CPU power supply FRU 2. Replace processor card
40112023	A high 1.8 voltage reading detected	1. Replace CPU power supply FRU 2. Replace processor card
40112032	A high 3.3 voltage reading detected	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
40112033	A high 2.5 voltage reading detected	1. Replace CPU power supply FRU 2. Replace processor card
40112052	A high +12 voltage reading detected	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
40112061	A high -12 voltage reading detected	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
40112062	A low 1.8 voltage reading detected	1. Replace CPU power supply FRU 2. Replace processor card
40112063	A critical low 1.8 voltage reading detected	1. Replace CPU power supply FRU 2. Replace processor card
40112064	A critical high 1.8 voltage reading detected	1. Replace CPU power supply FRU 2. Replace processor card
40112065	A critical low 2.5 voltage reading detected	1. Replace CPU power supply FRU 2. Replace processor card

Table A-2 (Page 4 of 13). Service processor error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
40112066	A critical high 2.5 voltage reading detected	1. Replace CPU power supply FRU 2. Replace processor card
40112082	A low 5.0 voltage reading detected	1. Replace CPU power supply FRU 2. Replace processor card
40112092	A low 3.3 voltage reading detected	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
40112093	A low 2.5 voltage reading detected	1. Replace CPU power supply FRU 2. Replace processor card
401120B2	A low +12 voltage reading detected	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
401120C2	A low -12 voltage reading detected	1. Replace CPU power supply FRU 2. Replace I/O planar. (See notes on A-2)
4020xxxx	Cooling problem detected (Also see following codes for exact match.)	Read the Service Processor Error Logs. Perform "Read Service Processor Error Logs" in Service processor menus. If various temperature faults (402xxxxx and 2BA003xx) are logged, replace the service processor card (332 MHz SMP node).
40200001	An unknown cooling problem detected.	Cooling problem; check system fans. Refer to "Action/Possible Failing FRU" under error code 4020xxxx for more information.
40200021	A CPU temperature warning detected.	Over temperature on processor card. Refer to "Action/Possible Failing FRU" under error code 4020xxxx for more information.
40200023	A critical CPU temperature condition detected.	Critical temperature on processor card. Refer to "Action/Possible Failing FRU" under error code 4020xxxx for more information.
40200031	An I/O planar temperature warning detected.	Over temperature on I/O planar. Refer to "Action/Possible Failing FRU" under error code 4020xxxx for more information.
40200033	A critical I/O planar temperature condition detected.	Critical temperature on I/O planar. Refer to "Action/Possible Failing FRU" under error code 4020xxxx for more information.
40200041	A memory temperature warning detected.	Over temperature on the memory card. Refer to "Action/Possible Failing FRU" under error code 4020xxxx for more information.
40200043	A critical memory temperature condition detected.	Critical temperature on the memory card. Refer to "Action/Possible Failing FRU" under error code 4020xxxx for more information.
40200051	An inlet temperature warning detected.	Over temperature on the airflow inlet.
40200053	An inlet memory temperature condition detected.	Critical temperature on the airflow inlet.
40210011	A slow fan detected.	Check: 1. Room operating temperature 2. Fans

Table A-2 (Page 5 of 13). Service processor error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
40210014	1. A stopped fan detected 2. If the system is running, refer to the AIX error log to find which fan is failing. If the system is not running, refer to the SP error log 3. Fan connector unplugged 4. Fan sensor defective	1. Check connector 2. Replace failing fan 3. Replace power supply FRU **Note:** SP Menu locations = F0-F3. AIX error log locations = F1-F4.
40210024	Loss of fan and subsequent slow fan. If the system is running, refer to the AIX error log to find which fan is failing. If the system is not running, refer to the SP error log.	1. Replace failing fan 2. Replace power supply FRU
40210091	Loss of fan. Refer to the SP error log to find which fan is failing.	1. Replace failing fan 2. Replace power supply FRU
40211804	Failure to communicate with FMC.	1. Replace failing fan 2. Replace power supply FRU
40A00000	System firmware IPL failure (surveillance).	1. Go to the Service Processor menus. 2. Select "System Information Menu". 3. Select "Read Progress Indicators from Last Boot" and use the posted code indicated by the arrow. (Refer to “Service processor checkpoints” on page A-36 or “Firmware checkpoints” on page A-40 for help.) 4. Replace I/O planar. (See notes on A-2) 5. If the problem persists, call the support center for assistance.
40B00000	The operating system surveillance interval exceeded.	Refer to “Action/Failing FRU” under error code 40A00000.
40B00100	Surveillance timeout on CPU 1 (slot 1).	Refer to “Action/Failing FRU” under error code 40A00000.
40B00101	Surveillance timeout on CPU 2 (slot 1).	Refer to “Action/Failing FRU” under error code 40A00000.
40B00102	Surveillance timeout on CPU 3 (slot 2).	Refer to “Action/Failing FRU” under error code 40A00000.
40B00103	Surveillance timeout on CPU 4 (slot 2).	Refer to “Action/Failing FRU” under error code 40A00000.
40D00003	An unknown slow shutdown commanded.	Critical cooling problem. Check to ensure the temperature is in the ambient range.
40D00004	An unknown fast shutdown commanded.	Locked fan failure detected. Make sure all fans are operating normally.
40D00101	BIST on I/O planar failed.	Replace I/O planar. (See notes on A-2.)
40D00102	BIST on system planar failed.	Replace system planar.
40D00200	Processor array initialization fail.	Location code will point to failing FRU.
40D00201	JTAG chip id miscompare.	Location code will point to failing FRU.
450000C0	Uncorrectable memory error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.

Table A-2 (Page 6 of 13). Service processor error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
450000C1	Memory ECC correctable error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
450000C2	Memory ECC correctable error threshold exceeded (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
450000C3	Memory controller subsystem internal error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
450000C4	Memory address error (invalid address or access attempt) (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
450000C5	Memory data error (bad data going to memory) (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
450000C6	Memory bus/switch internal error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
450000C7	Memory time-out error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
450000D0	System bus time-out error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
450000D1	System bus parity error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
450000D2	System bus protocol/transfer error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
450000D3	I/O host bridge time-out error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
450000D4	I/O host bridge address/data bus parity error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.

Table A-2 (Page 7 of 13). Service processor error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
450000D6	System support function error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
450000D7	System bus internal hardware/switch error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
45800000	Memory controller checkstop	Replace system planar. Perform the "POWER3 SMP Thin and Wide Node minimum configuration" MAP in Chapter 1, "Maintenance Analysis Procedures (MAPs)" on page 1-1.
45B00001	A non-compatible memory card is detected	Replace the memory card, as indicated by the physical location code, with a compatible memory card supported by this system.
45C00000	Memory checkstop (uncorrectable memory error)	1. Reboot the system in Service Mode. This preserves the AIX error log. Run diagnostics in problem determination mode. 2. Replace system planar
460000C0	I/O bus address parity error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
460000C1	I/O bus data parity error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
460000C2	I/O bus time-out, access, or other error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
460000C3	I/O bridge/device internal error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
460000C4	Error from a PCI to non-PCI bridge chip, indicating an error on the secondary bus (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
460000C5	Mezzanine/system bus address parity error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
460000C6	Mezzanine/system bus data parity error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.

Error Code	Description	Action / Possible Failing FRU
460000C7	Mezzanine/system bus time-out transfer or protocol error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
460000D4	I/O expansion bus data parity or CRC protocol error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
460000D5	I/O expansion bus data time-out, access, or other error (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
460000D6	I/O expansion bus connection failure (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
460000D7	I/O expansion bus unit not in an operating state (power down, off-line) (checkstop)	1. Replace the FRU as indicated by the physical location code. 2. Check the Service Processor error log for additional FRU.
460000D8	A generic memory controller-detected checkstop has occurred.	Consult AIX diagnostics for further information.
460000D9	A generic I/O controller-detected checkstop has occurred.	Consult AIX diagnostics for further information.
48800909	System VPD error	Replace I/O planar. (See notes on A-2.)
4880090A	System planar VPD read fail	1. Replace system planar 2. Replace I/O planar
4880090B	Error identifying system type using VPD	1. I^2C bus error 2. Replace I/O planar
4880090C	JTAG unable to confirm system type using system VPD	1. Remove cards 2. Verify part numbers 3. Install valid cards
4B2xxxyy	CPU problem	Except for xxx=010. Where *xxx* is the processor type. Refer to error code 2B2xxx22 for types. See the following code entries for specific description and actions.
4B2xxx00	Checkstop	1. Remove processor card in slot 2 (if installed). If the problem is resolved, replace the processor card. Else, continue 2. Exchange processor card in slot 1 with processor card removed from slot 2 in the previous step (replace processor card if only one processor card exists). If the problem is resolved, replace processor card. Else, continue 3. Replace CPU power supply FRU 4. Perform the "POWER3 SMP Thin and Wide Node minimum configuration" MAP in Chapter 1, “Maintenance Analysis Procedures (MAPs)” on page 1-1.

Table A-2 (Page 8 of 13). Service processor error codes.

Table A-2 (Page 9 of 13). Service processor error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
4B2xxx01	Checkstop - slot 1 fail.	1. Attempt to run Online (Disk Based) Diagnostics, this preserves the AIX error log; if the reboot fails, attempt Network Boot Diagnostics. If node boots to diagnostics, run in Problem Determination mode to determine the cause of the failure. Otherwise continue. 2. Replace processor card in slot 1 3. Replace system planar 4. Replace I/O planar (See notes on A-2)
4B2xxx02	Checkstop - slot 2 fail	1. Attempt to run Online (Disk Based) Diagnostics, this preserves the AIX error log; if the reboot fails, attempt Network Boot Diagnostics. If node boots to diagnostics, run in Problem Determination mode to determine the cause of the failure. Otherwise continue. 2. Replace processor card in slot 2 3. Replace system planar 4. Replace I/O planar. (See notes on A-2)
4B2xxx10	Machine check - 0	1. Attempt to run Online (Disk Based) Diagnostics, this preserves the AIX error log; if the reboot fails, attempt Network Boot Diagnostics. If node boots to diagnostics, run in Problem Determination mode to determine the cause of the failure. Otherwise continue. 2. Perform “332 MHz SMP Node minimum configuration” or “POWER3 SMP Thin and Wide Node minimum configuration” MAP in Chapter 1, “Maintenance Analysis Procedures (MAPs)” on page 1-1.
4B2xxx11	Machine check - 1 (stuck active)	1. Remove processor card in slot 2 (if installed). If problem is resolved, replace processor card, else continue. 2. Exchange processor card in slot 1 with processor card removed from slot 2 in step 1 (replace processor card if only one card exists). If problem is resolved, replace processor card, else continue. 3. Replace system board
4B2xxx41	ABIST fail.	ABIST fail on first CPU in slot identified by location code.
4B2xxx42	ABIST fail.	ABIST fail on second CPU in slot identified by location code.
4B2xxx51	LBIST fail	LBIST fail on first CPU in slot identified by location code.
4B2xxx52	LBIST fail	LBIST fail on second CPU in slot identified by location code.

Table A-2 (Page 10 of 13). Service processor error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
4B2xxxC0	CPU internal error. (Checkstop)	1. Replace the FRU as indicated by the physical location code. The xxx indicates the processor type. Refer to error code 2B2xxx22 for xxx definitions. 2. Check the service processor error log for additional FRU.
4B2xxxC1	CPU internal cache or cache controller error. (Checkstop)	1. Replace the FRU as indicated by the physical location code. The xxx indicates the processor type. Refer to error code 2B2xxx22 for xxx definitions. 2. Check the service processor error log for additional FRU.
4B2xxxC2	External cache parity or multi-bit ECC error. (Checkstop)	1. Replace the FRU as indicated by the physical location code. The xxx indicates the processor type. Refer to error code 2B2xxx22 for xxx definitions. 2. Check the service processor error log for additional FRU.
4B2xxxC3	External cache single-bit ECC error. (Checkstop)	1. Replace the FRU as indicated by the physical location code. The xxx indicates the processor type. Refer to error code 2B2xxx22 for xxx definitions. 2. Check the service processor error log for additional FRU.
4B2xxxC4	System bus time-out error. (Checkstop)	1. Replace the FRU as indicated by the physical location code. The xxx indicates the processor type. Refer to error code 2B2xxx22 for xxx definitions. 2. Check the service processor error log for additional FRU.
4B2xxxC5	System bus time-out error, waiting for I/O. (Checkstop)	1. Replace the FRU as indicated by the physical location code. The xxx indicates the processor type. Refer to error code 2B2xxx22 for xxx definitions. 2. Check the service processor error log for additional FRU.
4B2xxxC6	System bus parity error. (Checkstop)	1. Replace the FRU as indicated by the physical location code. The xxx indicates the processor type. Refer to error code 2B2xxx22 for xxx definitions. 2. Check the service processor error log for additional FRU.
4B2xxxC7	System bus protocol/transfer error. (Checkstop)	1. Replace the FRU as indicated by the physical location code. The xxx indicates the processor type. Refer to error code 2B2xxx22 for xxx definitions. 2. Check the service processor error log for additional FRU.
4B2xxxC8	A generic CPU detected checkstop has occurred.	Consult AIX diagnostics for further information.
4B20000A	All CPUs have been deconfigured	1. Replace processor cards 2. Replace I/O planar. (See notes on A-2)

Table A-2 (Page 11 of 13). Service processor error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
4B200043	Service Processor reports JTAG fail.	1. Make sure power cables at processor card and system planar are properly seated. 2. (332 MHz SMP Node only.) The service processor card is the least likely failure, but it is the tester in this case. Replace the service processor card to assure true failure indication. If the failure disappears, the service processor card was bad. Otherwise, reinstall the old service processor card. 3. Replace the processor card(s). 4. Replace the system planar. 5. Replace I/O planar. (See notes on A-2)
4B200054	The processor cards are not compatible with each other.	1. Remove cards 2. Verify part numbers 3. Install valid cards
4B200055	All CPUs got deconfigured	1. If only one processor card is used, it must be in slot 1 2. If two processor cards are being used, replace the card in slot 1
4B200056	No processor card in first slot.	1. If only one processor card is used, it must be in slot 1 2. If two processor cards are being used, replace the card in slot 1
4B200057	Processor cards are not compatible with each other.	1. Remove cards 2. Verify part numbers 3. Install valid (compatible) cards
4B200058	Compatibility test on processor card 0 failed	1. Remove cards 2. Verify part numbers 3. Install valid (compatible) cards
4B200059	Compatibility test on processor card 1 failed	1. Remove cards 2. Verify part numbers 3. Install valid (compatible) cards
4B201000	Checkstop.	1. Attempt to reboot the system in Service Mode, this preserves the AIX error log. If the reboot fails, attempt to reboot from Ethernet. If the reboot is successful, run diagnostics in Problem Determination mode to determine the cause of the failure. Otherwise continue 2. Replace processor card 3. Replace system planar 4. Replace PCI adapter 5. Replace I/O planar. (See notes on A-2)
4B201020	TEA Error.	Perform "332 MHz SMP Node minimum configuration" or "POWER3 SMP Thin and Wide Node minimum configuration" MAP in Chapter 1, "Maintenance Analysis Procedures (MAPs)" on page 1-1.

Table A-2 (Page 12 of 13). Service processor error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
4BA00000	The system support controller detects the service processor, but cannot establish communication. The system halts.	1. Replace the service processor card (332 MHz SMP node) 2. Replace the I/O Planar. (See notes on A-2)
4BA00001	The system support controller cannot detect the service processor.	1. Replace the service processor (332 MHz SMP node) 2. Replace the I/O Planar. (See notes on A-2)
4BA00800	Unknown service processor error.	Check level of service processor, if it is the latest level and problem persists, call support.
4BA00814	NVRAM checksum (CRC) fail.	Recoverable temporary condition, unless succeeded by 4BA80015.
4BA00815	NVRAM reinitialization fail.	Replace I/O planar.
4BA00826	Service processor cannot call home.	Replace the I/O Planar. (See notes on A-2.)
4BA00828	Flash update (CRC) checksum fail.	Replace the flash image.
4BA00829	Bad system firmware.	Replace the I/O Planar. (See notes on A-2.)
4BA00830	Boot fail.	1. Verify bootlist in SMS menus 2. See "E1xx code boot problems" on page 3-19
4BA00831	Bad service processor image.	Replace the I/O Planar. (See notes on A-2.)
4BA00832	Error while doing flash update.	1. Power the system on and retry the flash programming a few times 2. Replace I/O planar
4BA10001	SSC SRAM fail.	1. Replace I/O planar. (See notes on A-2) 2. Replace service processor card (332 MHz SMP node)
4BA10002	SSC flash fail.	1. Replace I/O planar. (See notes on A-2) 2. Replace service processor card (332 MHz SMP node)
4BA10003	Service processor fail.	1. Replace I/O planar. (See notes on A-2) 2. Replace service processor card (332 MHz SMP node)
4BA10004	Service processor firmware fail.	1. If attempting to download service processor firmware, verify that the firmware file is not corrupted 2. Power the node circuit breaker(s) off 3. Wait 30 seconds, then power the node circuit breaker(s) on 4. If you get the same symptom, replace the service processor card (332 MHz SMP node)
4BA10005	I^2C Path Fail.	1. Replace I/O planar. (See notes on A-2) 2. Replace processor card 3. Replace system planar

Table A-2 (Page 13 of 13). Service processor error codes.		
Error Code	**Description**	**Action / Possible Failing FRU**
4BA80013	NVRAM.	Perform “332 MHz SMP Node minimum configuration” or “POWER3 SMP Thin and Wide Node minimum configuration” MAP in Chapter 1, “Maintenance Analysis Procedures (MAPs)” on page 1-1.
4BA80014	NVRAM (CRC) checksum fail.	Recoverable temporary condition, unless succeeded by 4BA80015.
4BA80015	NVRAM reinitialization fail.	1. Power off the node circuit breakers 2. Clear the NVRAM manually. 3. Replace the I/O planar.

Memory PD bits: The following table expands the firmware error code **25Cyyxxx** (see Table A-1 on page A-3), where **yy** is the PD values in the table below. Use these values to identify the type of memory that generated the error.

If you replace FRUs and the problem is still not corrected, go to “332 MHz SMP Node minimum configuration” or “POWER3 SMP Thin and Wide Node minimum configuration” MAP in Chapter 1, “Maintenance Analysis Procedures (MAPs)” on page 1-1, unless otherwise indicated in the tables.

Table A-3. 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node memory module PD bits			
PD value	**Size**	**Clock Cycle (nsecs)**	**Parity/ ECC**
28	512MB	10	ECC
2A	512MB	8	ECC
38	128MB	10	ECC
3A	128MB	8	ECC
48	64MB	10	ECC
4A	64MB	8	ECC
58	32MB	10	ECC
5A	32MB	8	ECC
68	256MB	10	ECC
6A	256MB	8	ECC

Notes:

1. To get the memory size and part number, use the Service Processor menus (“Service processor menus” on page 3-32) or **lscfg -pv** ^{3} **pg** and look for information for the "memory-module".
2. Memory modules must be installed in pairs. 32MB memory modules are **not** supported in the 332 MHz SMP and POWER3 SMP Thin and Wide nodes.

Bus SRN to FRU reference table

The following table is used to locate defective FRUs within the I/O planar PCI and ISA buses. The table indicates which devices should be tested for each SRN. For this procedure, if possible, diagnostics are run on the I/O planar bus devices with all adapters removed from the failing bus. If a failure is detected on this system with all adapters removed from the failing bus, the I/O planar is the isolated FRU. If a failure is not detected, the adapters are added back one at a time, to their original slot location, and the configuration is tested until a failure is detected. The failure is then isolated to the failing FRU.

If a failure has not been detected and all the FRUs have been tested, call your technical service support person for assistance.

Table A-4. 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node bus SRN to FRU reference table

SRN	Bus Identification	Possible Failing Device and AIX Location Code	Associated FRU
9CC-100	PCI bus 00	Internal SCSI port 1 (10-60)	I/O planar. (See notes on A-2.)
		Internal Ethernet port (10-80)	I/O planar. (See notes on A-2.)
		PCI adapter installed in thin node chassis slot I2 (10-70 to 10-77)	Adapter
		PCI adapter installed in thin node chassis slot I3 (10-68 to 10-6F)	Adapter
		PCI riser card (P3-X1)	PCI riser card
		PCI bus 00 (P2) - Thin node chassis slots I2-I3	I/O planar (See notes on A-2.)
9CC-101	PCI bus 01	PCI adapter installed in I/O expansion chassis slot I1 (20-58 to 20-5F)	Adapter
		PCI adapter installed in I/O expansion chassis slot I2 (20-60 to 20-67)	Adapter
		PCI adapter installed in I/O expansion chassis slot I3 (20-68 to 20-6F)	Adapter
		PCI adapter installed in I/O expansion chassis slot I4 (20-70 to 20-77)	Adapter
		PCI riser card (P3-X1)	PCI riser card
		PCI bus 01 (P3) - I/O expansion chassis slots I1-I4	PCI Expansion planar
9CC-102	PCI bus 02	PCI adapter installed in I/O expansion chassis slot I5 (2F-00 to 2F-07)	Adapter
		PCI adapter installed in I/O expansion chassis slot I6 (2F-08 to 2F-0F)	Adapter
		PCI adapter installed in I/O expansion chassis slot I7 (2F-10 to 2F-17)	Adapter
		PCI adapter installed in I/O expansion chassis slot I8 (2F-18 to 2F-1F)	Adapter
		PCI riser card (P3-X1)	PCI riser card
		PCI bus 02 (P3) - I/O expansion chassis slots I5-I8PCI Expansion planar	PCI Expansion planar
651-730	ISA bus	Diskette drive port/device (01-D1-00-00)	I/O planar. (See notes on A-2.)
		Serial ports (1 and 2)/device (01-S1 and 01-S2)	I/O planar. (See notes on A-2.)
		Mouse port/device (01-K1-01-00)	I/O planar. (See notes on A-2.)
		Keyboard port/device (01-K1-00-00)	I/O Planar. (See notes on A-2.)

Checkpoints

Checkpoints are intended to let users and service personal know what the server is doing, with some detail, as it initializes. These checkpoints are not intended to be error indicators, but in some cases a server 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. See "Read service processor error logs" on page 3-39.

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-40.

Note: Go to "332 MHz SMP Node minimum configuration" or "POWER3 SMP Thin and Wide Node minimum configuration" MAP in Chapter 1, "Maintenance Analysis Procedures (MAPs)" on page 1-1 for any of the following conditions:

- A four-digit code in the range of E001 through EFFF displays on the LCD display but 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

Table A-5 (Page 1 of 5). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node service processor checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E000	System support controller begins operation. This is an informational checkpoint.	1. Replace service processor card (332 MHz SMP node) 2. Replace I/O planar. (See notes A-2) See note on A-36.
E010	Starting service processor self-tests	1. Replace service processor card (332 MHz SMP node) 2. Replace I/O planar. (See notes on A-2)
E011	Service processor self-tests completed successfully	NA
E012	Begin to set up service processor helps	1. Replace I/O planar. (See notes on A-2) 2. Replace service processor card (332 MHz SMP node)
E01F	Bad self-test; cannot continue	
E020	Configuring CMOS	1. Replace I/O planar. (See notes on A-2) 2. Replace service processor card (332 MHz SMP node)

Table A-5 (Page 2 of 5). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node service processor checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E021	Configuring NVRAM	1. Replace I/O planar. (See notes on A-2) 2. Replace service processor card (332 MHz SMP node)
E022	Accessing system planar VPD	Replace the system planar.
E023	Accessing memory card 1 VPD	Replace memory card 1.
E024	Accessing memory card 2 VPD	Replace memory card 2.
E025	Service processor accessing VPD on memory card 1.	N/A
E026	Service processor accessing VPD on memory card 2.	N/A
E030	Beginning to build I^2C resources	1. Replace service processor card (332 MHz SMP node) 2. Replace I/O planar. (See notes on A-2)
E031	Finished building I^2C resources	1. Replace service processor card (332 MHz SMP node) 2. Replace processor card 3. Replace I/O planar. (See notes on A-2)
E032	JTAG self-test	Replace I/O planar. (See notes on A-2)
E040	Starting serial port tests	1. Replace service processor card (332 MHz SMP node) 2. Replace I/O planar. (See notes on A-2)
E042	Configuring serial port 1	1. Replace service processor card (332 MHz SMP node) 2. Replace I/O planar. (See notes on A-2)
E043	Configuring serial port 2	1. Replace service processor card (332 MHz SMP node) 2. Replace I/O planar. (See notes on A-2)
E044	Preparing to set serial port line speed	1. Replace service processor card (332 MHz SMP node) 2. Replace I/O planar. (See notes on A-2)
E045	Preparing to initialize serial port	1. Replace service processor card (332 MHz SMP node) 2. Replace I/O planar. (See notes on A-2)
E05x	Reserved.	Call for support.
E051	Reading CPU VPD	Replace I/O planar. (See notes on A-2).
E052	Reading memory card and DIMM VPD	Replace memory card(s) or DIMMs,
E053	Reading system planar VPD	Replace system planar.
E054	Reading I/O VPD	Replace I/O planar.
E060	Preparing to auto power-on (power restored)	1. Replace service processor card (332 MHz SMP node) 2. Replace I/O planar. (See notes on A-2)

Table A-5 (Page 3 of 5). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node service processor checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E061	Preparing to auto power-on (Timer)	1. Replace service processor card (332 MHz SMP node) 2. Replace I/O planar. (See notes on A-2)
E070	Configuring modem	1. Replace modem 2. Replace service processor card (332 MHz SMP node) 3. Replace I/O planar. (See notes on A-2) 4. Replace processor card
E072	Preparing to call home	1. Replace modem 2. Replace service processor card (332 MHz SMP node) 3. Replace I/O planar. (See notes on A-2) 4. Replace processor card
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 on page A-38. 2. Replace service processor card (332 MHz SMP node) 3. Replace I/O planar. (See notes on A-2)
E076	Leaving Service Processor menus; attempting to disconnect modems	1. Replace service processor card (332 MHz SMP node) 2. Replace I/O planar. (See notes on A-2) 3. Replace processor card
E080	Leaving Service Processor menus; attempting to disconnect modems.	1. Switch system power on. 2. Replace I/O planar. (See notes on A-2)
E0A0	Beginning Bring-Up Phase	1. Replace service processor card (332 MHz SMP node) 2. Replace I/O planar. (See notes on A-2) 3. Replace processor card 4. Replace PCI riser card assembly (332 MHz SMP node)
E0B0	Starting CPU BIST	1. Replace processor card 2. Replace I/O planar. (See notes on A-2) 3. Replace service processor card (332 MHz SMP node)
E0BF	CPU BIST fail	1. Replace CPU card 2. Replace system planar 3. Replace I/O planar
E0C0	Starting X5 BIST	1. Replace processor card 2. Replace I/O planar. (See notes on A-2) 3. Replace service processor card (332 MHz SMP node)

Table A-5 (Page 4 of 5). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node service processor checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E0D0	Creating scanlog	Wait up to 5 minutes for dump to complete.
E0E0	Pulling CPU out of reset	1. Replace processor card 2. Replace I/O planar. (See notes on A-2) 3. Replace service processor card (332 MHz SMP node)
E0E1	CPU not able to start.	1. Make sure the CPU power supply is properly seated. Push on the CPU power supply lever marked "PUSH" 2. If this is a 332 MHz SMP node, check for CPU card failure: a. Power off node (Perspectives) and open TTY console (*s1term –w Frame# Node#*). b. On TTY console, Main SP Menu, enter **86060** to start the hidden menu. c. Disable CPUs 0 and 1 by selecting them on the menu. d. Quit menu and power on the node (Perspectives). e. If node boots, shutdown node, then replace CPU card in the first slot. f. If node hangs at E0E1, power off node, re-enable CPUs 0 and 1, then disable CPUs 2 and 3. g. Quit SP menu and power on node (Perspectives). h. If node boots, replace CPU card in second slot. **Note:** Running AIX with disabled CPUs may result in some unexpected CPU status. 3. If node fails to boot, generate a hardware call. Ensure PMH reflects correct system serial number.
E0E2	Check point for "Hot-Swap" fans and power supply.	Power supply hot-swap is in progress. Fans and power supply must be replaced within 5 minutes. After 5 minutes the service processor initiates a fast shutdown of the system. **Note:** Not applicable for this node.

Table A-5 (Page 5 of 5). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node service processor checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E0FF	Bad Service Processor (SP) firmware. Reflash.	1. If attempting to download service processor firmware, verify that the firmware file is not corrupted 2. Power the node circuit breaker(s) off 3. Wait 30 seconds, then power the node circuit breaker(s) on 4. If you get the same symptom, replace the service processor card (332 MHz SMP Node) 5. Replace I/O planar. (See notes on A-2.)
OK	Service processor ready waiting for power-On	None. Normal operation.
STBY	Service Processor ready. System was shut-down 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.
Diag_STBY	Appears in diagnostics mode. Service Processor ready. System was shutdown by the operating system and is still powered on.	This condition can be requested (with no faults) by a privileged system user. See the Service Processor error log for possible operating system fault indications.

Firmware checkpoints

Firmware uses progress codes (checkpoints) in the range of E1xx to EFFF. These checkpoints occur during system startup and maybe be useful in diagnosing certain problems. Service processor checkpoints are listed in "Service processor checkpoints" on page A-36.

Note: If you replace FRUs and the problem is still not corrected, go to "332 MHz SMP Node minimum configuration" or "POWER3 SMP Thin and Wide Node minimum configuration" MAP in Chapter 1, "Maintenance Analysis Procedures (MAPs)" on page 1-1, unless otherwise indicated in the tables.

Table A-6 (Page 1 of 10). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E100	Reserved/unused	See note on A-36.
E101	Video enabled, extended memory test (quick restart path)	See note on A-36.
E102	Firmware restart (quick restart path)	See note on A-36.
E103	Set memory refresh (composite img)	See note on A-36.
E104	Set memory refresh (recovery block)	See note on A-36.
E105	Transfer control to operating system (normal boot).	See "E1xx code boot problems" on page 3-19.
E108	Run recovery block base memory (test 2K), set stack	See note on A-36.

Table A-6 (Page 2 of 10). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E109	Copy CRC verification code to RAM	See note on A-36.
E10A	Turn on cache	See note on A-36.
E10B	Flush cache	See note on A-36.
E10C	Jump to CRC verification code in RAM	See note on A-36.
E10D	Compute composite image CRC	See note on A-36.
E10E	Jump back to ROM	See note on A-36.
E10F	Transfer control to Open Firmware	See note on A-36.
E110	Turn off cache, check if composite image CRC is valid	See note on A-36.
E111	GOOD CRC - jump to composite image	See note on A-36.
E112	BAD CRC - initialize base memory, stack	See note on A-36.
E113	BAD CRC - copy uncompressed recovery block code to RAM	See note on A-36.
E114	BAD CRC - jump to code in RAM	See note on A-36.
E115	BAD CRC - turn on cache	See note on A-36.
E116	BAD CRC - copy recovery block data section to RAM	See note on A-36.
E117	BAD CRC - Invalidate and flush cache, set TOC	See note on A-36.
E118	BAD CRC - branch to high level recovery control routine.	See note on A-36.
E119	Initialize base memory, stack	See note on A-36.
E11A	Copy uncompressed recovery block code to RAM	See note on A-36.
E11B	Jump to code in RAM	See note on A-36.
E11C	Turn on cache	See note on A-36.
E11D	Copy recovery block data section to RAM	See note on A-36.
E11E	Invalidate and flush cache, set TOC	See note on A-36.
E11F	Branch to high level control routine.	See note on A-36.
E120	Initialize I/O and early memory block	See note on A-36.
E121	Initialize service processor	See note on A-36.
E122	No memory detected (system lockup)	1. Replace memory modules 2. Replace memory card 3. Replace system planar 4. See note on A-36
E123	No memory module found in socket.	See note on A-36.
E124	Disable defective memory bank	See note on A-36.
E125	Clear PCI devices command reg, go forth	See note on A-36.
E126	Check valid image - start	See note on A-36.

Table A-6 (Page 3 of 10). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E127	Check valid image - successful	See note on A-36.
E128	Disable interrupts, set interrupt vectors for Open Firmware.	See note on A-36.
E129	Validate target RAM address	See note on A-36.
E12A	Copy ROM to RAM, flush cache	See note on A-36.
E12B	Set MP operational parameters	See note on A-36.
E12C	Set MP CPU node characteristics	See note on A-36.
E12D	Park secondary processors in parking lot	See note on A-36.
E12E	Primary processor sync	See note on A-36.
E12F	Unexpected return from Open Firmware (system lockup)	See note on A-36.
E130	Build device tree	See note on A-36.
E131	Create ROOT node	See note on A-36.
E132	Create CPUs node	See note on A-36.
E133	Create L2 Cache node	See note on A-36.
E134	Create memory node	See note on A-36.
E135	Create memory module node	See note on A-36.
E136	Test memory	See note on A-36.
E137	Create openprom node	See note on A-36.
E138	Create options node	See note on A-36.
E139	Create aliases node and system aliases	See note on A-36.
E13A	Create packages node	See note on A-36.
E140	PReP style load	See note on A-36.
E149	Create boot mgr node	See note on A-36.
E14C	Create terminal-emulator node	See note on A-36.
E14D	Load boot image	See “E1xx code boot problems” on page 3-19.
E14E	Create client interface node/directory	See note on A-36.
E14F	NVRAM validation, config variable token generation	See note on A-36.
E150	Create host (primary) PCI controller node	See note on A-36.
E151	Probing primary PCI bus	1. Replace PCI adapters 2. Replace I/O planar If a network adapter or I/O planar is replaced, see A-2. See note on A-36.

Table A-6 (Page 4 of 10). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E152	Probe for adapter FCODE, evaluate if present	1. PCI adapters 2. I/O planar If a network adapter or I/O planar is replaced, see A-2. See note on A-36.
E153	End adapter FCODE, probe/evaluation	1. Perform minimum configuration isolation of PCI adapters 2. If unsuccessful, go to "332 MHz SMP Node minimum configuration" or "POWER3 SMP Thin and Wide Node minimum configuration" MAP in Chapter 1, "Maintenance Analysis Procedures (MAPs)" on page 1-1. For wide node, focus on I/O expansion planar, PCI riser card, and flex cable. For thin/wide node, focus on I/O planar.
E154	Create PCI bridge node	See note on A-36.
E155	Probe PCI bridge secondary bus	Perform actions for code E153.
E156	Create PCI Ethernet node	See note on A-36.
E15A	Create 64 bit host (primary) PCI controller node	See note on A-36.
E15B	Transferring control to operating system (service mode boot)	See "E1xx code boot problems" on page 3-19.
E15C	Probe primary 64 bit PCI bus	See note on A-36.
E15D	Create host PCI controller node	See note on A-36.
E15E	Create MPIC node	See note on A-36.
E15F	Adapter VPD probe	See note on A-36.
E160	CPU node VPD creation	See note on A-36.
E161	Root node VPD creation	See note on A-36.
E162	SP node VPD creation	See note on A-36.
E164	Create PCI graphics node (P9)	See note on A-36.
E168	Create PCI graphics node (S3)	See note on A-36.
E16C	GTX100P subsystem open request.	See note on A-36.
E16D	GTX100P Planar not detected or failed diagnostics.	See note on A-36.
E16E	GTX100P subsystem open successful.	See note on A-36.
E16F	GTX100P close subsystem.	See note on A-36.
E170	Start of PCI bus probe	See note on A-36.
E171	Executing PCI-delay function	See note on A-36.
E172	First pass PCI device probe	See note on A-36.

Table A-6 (Page 5 of 10). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E174	Establish host connection	Refer to "E1xx code boot problems" on page 3-19 for general considerations.
E175	Boot up request	Refer to "E1xx code boot problems" on page 3-19 for general considerations. 1. Power off, then on, then retry the boot operation 2. Verify the network connection (network could be down) 3. Have network administrator verify the server configuration for this client
E176	TFTP file transfer	See note on A-36.
E177	Transfer failure due to TFTP error condition	See note on A-36.
E178	Create PCI token ring node	See note on A-36.
E17B	Processor frequency measurement.	Replace I/O planar. (See notes on A-2.)
E180	Service processor command setup	See note on A-36.
E183	Service processor POST	See note on A-36.
E190	Create ISA node	See note on A-36.
E193	Initialize Super I/O.	See note on A-36.
E196	Probe ISA bus.	See note on A-36.
E19B	Create service processor node.	See note on A-36.
E19C	Create tablet node.	See note on A-36.
E19D	Create NVRAM node.	See note on A-36.
E19E	Real time clock (RTC) creation and initialization.	Refer to error code 28030xxx in "Firmware and service processor codes" on page A-2.
E19F	Create EEPROM node.	See note on A-36.
E1AD	See description of checkpoint E1DE.	See note on A-36.
E1B0	Create lpt node.	See note on A-36.
E1B1	Create serial node.	See note on A-36.
E1B2	Create audio node.	See note on A-36.
E1B3	Create 8042 node.	See note on A-36.
E1B6	Probe for (ISA) keyboard.	See note on A-36.
E1BA	Enable L2 cache.	See note on A-36.
E1BB	Set cache parms for burst.	See note on A-36.
E1BC	Set cache parms for 512KB.	See note on A-36.
E1BD	Probe for (ISA) mouse.	See note on A-36.
E1BE	Create op-panel node.	See note on A-36.
E1BF	Create pwr-mgmt node.	See note on A-36.
E1C0	Create ISA Ethernet node.	See note on A-36.
E1C5	Create ISA interrupt controller (pic) node.	See note on A-36.

Table A-6 (Page 6 of 10). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E1C6	Create dma node.	See note on A-36.
E1D0	Create PCI SCSI node.	See note on A-36.
E1D3	Create (* wildcard *) SCSI block device node (SD).	See note on A-36.
E1D4	Create (* wildcard *) SCSI byte device node (ST).	See note on A-36.
E1DB	Create floppy controller (FDC) node.	See note on A-36.
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. Drain the NVRAM (see "Draining the NVRAM" on page 3-17). 4. Replace the I/O planar
E1DD	Early processor exception	Replace I/O planar (See notes on A-2.) See note on A-36.
E1DE	Alternating pattern of E1DE and E1AD is used to indicate a Default Catch condition before the firmware "checkpoint" word is available.	Replace I/O planar (See notes on A-2.) See note on A-36.
E1DF	Create diskette drive (disk) node	See note on A-36.
E1E0	Program flash	See note on A-36.
E1E1	Flash update complete	See note on A-36.
E1E2	Initialize System I/O	See note on A-36.
E1E3	PReP boot image initialization.	See note on A-36.
E1E4	Initialize Super I/O with default values.	See note on A-36.
E1E5	XCOFF boot image initialization.	See note on A-36.
E1E6	Set up early memory allocation heap.	See note on A-36.
E1E7	PE boot image initialization.	See note on A-36.
E1E8	Initialize primary diskette drive (polled mode).	See note on A-36.
E1E9	ELF boot image initialization.	See note on A-36.

Table A-6 (Page 7 of 10). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E1EA	Firmware flash corrupted	1. Ensure that the hard drive contains a recovery image appropriate for this processor node 2. The System Management Services recovery procedure for the flash EEPROM should be executed. See "Service processor flash EPROM updates (and system firmware)" on page 3-46 If the hard drive contains the correct recovery image file, then suspect: 1. The recovery image file 2. The hard disk 3. The I/O planar. (See notes on A-2) See note on A-36.
E1EB	Verify flash EPROM recovery image.	Perform actions for code E1EA.
E1EC	Get recovery image entry point	See note on A-36.
E1ED	Invalidate instruction cache	See note on A-36.
E1EE	Jump to composite image	See note on A-36.
E1EF	Erase flash	See note on A-36.
E1F0	Start O.B.E.	See note on A-36.
E1F1	Begin self-test sequence on boot device(s)	See note on 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 *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 *RS/6000 SP: System Service Guide*.
E1F5	Build boot device list.	This may be caused by Multiboot option enabled. Disable using SMS Multiboot Menu, setting Multiboot Startup <OFF>. 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 *RS/6000 SP: System Service Guide*.
E1F6	Determine boot device sequence.	See note on A-36.

Checkpoint	Description	Action/ Possible Failing FRU
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 (See notes on A-2). See note on A-36.
E1FB	Scan SCSI bus for attached devices.	See note on A-36.
E1FD	Default Catch	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 "332 MHz SMP Node minimum configuration" or "POWER3 SMP Thin and Wide Node minimum configuration" MAP in Chapter 1, "Maintenance Analysis Procedures (MAPs)" on page 1-1.
E201	Setup PHB BARC addresses.	Replace the I/O planar (See notes on A-2.) See note on A-36.
E202	Initialize PHB registers and PHB's PCI configuration registers.	Replace the I/O planar (See notes on A-2.) See note on A-36.
E203	Look for PCI to ISA bridge.	Replace the I/O planar (See notes on A-2.) See note on A-36.
E204	Setup ISA bridge. PCI config. registers and initialize	Replace the I/O planar (See notes on A-2.) See note on A-36.
E206	Look for PRISM on PCG and switch to 50MHz.	Replace the I/O planar (See notes on A-2.) See note on A-36.
E207	Setup Data gather mode and 64/32-bit mode on PCG.	Replace the I/O planar (See notes on A-2.) See note on A-36.
E208	Assign bus number on PCG.	Replace the I/O planar (See notes on A-2.) See note on A-36.
E209	Assign PCI I/O addresses on PCI.	Replace the I/O planar (See notes on A-2.) See note on A-36.
E20A	Assign PCI I/O addresses on PCG	Replace the I/O planar (See notes on A-2.) See note on A-36.

Table A-6 (Page 8 of 10). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware checkpoints.

Table A-6 (Page 9 of 10). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E20B	Check MCERs stuck at fault.	1. Replace the system planar. See note on A-36 2. Replace the interposer card in the I/O expansion assembly 3. If the problem persists, go to “332 MHz SMP Node minimum configuration” or “POWER3 SMP Thin and Wide Node minimum configuration” MAP in Chapter 1, “Maintenance Analysis Procedures (MAPs)” on page 1-1.
E20C	Testing L2 cache.	Replace the processor card (See notes on A-2.) See note on A-36.
E211	IPL ROS CRC checking.	Replace the I/O planar (See notes on A-2.) See note on A-36.
E212	Processor POST.	Replace the processor card (See notes on A-2.) See note on A-36.
E213	Initial memory configuration.	1. Replace the memory card (See notes on A-2) 2. Replace the system planar. See note on A-36
E214	Memory test.	1. Replace the memory card 2. Replace the I/O planar. (See notes on A-2.) See note on A-36.
E216	Copy ROS into RAM. Setup Translation and C environment.	Replace the memory card (See notes on A-2.) See note on A-36.
E218	Memory test	Replace the memory card (See notes on A-2.) See note on A-36.
E21A	System has good memory.	See note on A-36.
E220	Final memory configuration.	Go to “332 MHz SMP Node minimum configuration” or “POWER3 SMP Thin and Wide Node minimum configuration” MAP in Chapter 1, “Maintenance Analysis Procedures (MAPs)” on page 1-1.
E240	Set up Winbond ISA bridge.	Replace the I/O planar (See notes on A-2.)
E241	Reset PCI bus.	Replace the I/O planar (See notes on A-2.)
E242	Initialize ISA DMA channel.	Replace the I/O planar (See notes on A-2.)
E246	System firmware corrupted, take recover path.	Replace the I/O planar (See notes on A-2.)
E247	Capture DIMM SPD's into NVRAM.	Replace the I/O planar (See notes on A-2.)
E249	Enter recover path's main code.	Replace the I/O planar (See notes on A-2.)
E297	Start firmware softload path execution	See note on A-36.
E298	Start firmware softload path execution	See note on A-36.
E299	Start C code execution.	See note on A-36.

Table A-6 (Page 10 of 10). 332 MHz SMP and POWER3 SMP (200 and 375 MHz) Thin and Wide Node firmware checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E3xx	Memory test	See "Memory test hang problem" on page 3-18.
E440	Validate NVRAM, initialize partitions as needed.	1. Verify that the system and service processor firmware levels are at the current release levels, update as necessary 2. Replace the memory card (See notes on A-2.) See note on A-36
E441	Generate /options node NVRAM configuration variable properties.	1. Verify that the system and service processor firmware levels are at the current release levels, update as necessary 2. Replace the memory card (See notes on A-2. Also, See note on A-36)
E442	Validate NVRAM partitions.	1. Verify that the system and service processor firmware levels are at the current release levels, update as necessary 2. Replace the memory card (See notes on A-2.) See note on A-36
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 note on A-36.
E600	SSA PCI adapter open firmware has run successfully.	
E601	SSA PCI adapter BIST started but failed to complete after 4 seconds.	Replace I/O adapter.
E602	SSA PCI adapter open firmware started.	Replace I/O adapter.
E603	SSA PCI adapter BIST completed with an error.	Replace I/O adapter.
E604	SSA PCI adapter BIST and subsequent POSTs completed successfully.	Replace I/O adapter.
E605	SSA PCI adapter BIST completed successfully, but subsequent POSTs failed.	Replace I/O adapter.
E60E	SSA PCI adapter open firmware about to exit (no stack corruption).	Replace I/O adapter.
E60F	SSA PCI adapter open firmware has run successfully.	Replace I/O adapter.
E6FF	SSA PCI adapter open firmware about to exit (with stack corruption).	Replace I/O adapter.

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: The format for the location code is an alphanumeric string of variable length, consisting of a series of location identifiers, separated by the standard dash (-) or slash (/) character. The series is hierarchical; that is, each location identifier in the string is a physical child of the one preceding it.

- The - (dash) separator character represents a normal structural relationship where the child is a separate physical package and it plugs into (or is connected to) the parent. For example, P1-C1 is a processor card (C1) plugged into a planar (P1), or P1-M1 is a memory card (M1) plugged into a planar (P1).
- The / (slash) separator character separates the base location code of a function from any extended location information. A group of logical devices can have the same base location code because they are all on the same physical package, but may require extended location information to describe the connectors they support. For example, P2/S1 describes the location of the serial port 1 controller and its connector (S1), which is located on planar P2 (its base location code), but the / indicates that further devices can be connected to it at the external S1 serial connector. The keyboard controller and its connector likewise have location code P2/K1, which means they have the same base location code (P2) as serial port 1, but a different external connector. In contrast, the location code P2-K1 actually points to the device connected to connector K1; that is, the keyboard. The location code P2/Z1 indicates an integrated SCSI controller which drives connector Z1, while location codes of P2-Z1-... point to the actual SCSI bus and devices.

Each location identifier consists of one alpha prefix character that identifies a location type, and a decimal integer number (typically one or two digits) that identifies a specific instance of this location type. Certain location types may also support secondary sub-locations, which are indicated by appending a period (".") character and a sub-location instance number.

Specifically, the format of a location code is defined as follows:

pn[.n][- or /]pn[.n][- or /]...

Where p is a defined alpha location type prefix, n is a location instance number, and [.n] is a sub-location instance number (where applicable). Sub-location notation is used only for location types which have clearly defined and limited expansion sites; for example, memory SIMMs slots on a memory card. Primarily, the [.n] sub-location notation is intended for use as an abbreviation of the location code in cases where:

1. Based on the device structure, the abbreviated sub-location code conveys the same information in a more concise form than an additional level of location identifier -- for example:
   - P1-M1.4 (pluggable module 4 on Memory Card 1 on Planar 1), rather than P1-M1-M4
   - P1-C1.1 (pluggable processor 1 on processor card 1 on planar 1), rather than P1-C1-C1

- P2-Z1-A3.1 (LUN 1 at SCSI ID 3 on integrated SCSI bus 1 from planar 2), rather than P2-Z1-A3-A1

2. The sub-location is either a basic physical extension or sub-enclosure of the base location, but does not represent additional function or connectivity; for example, a drawer in a rack (U1.2) or a riser card on an I/O planar (P2.1).

332 MHz SMP Thin and Wide Node AIX and physical location code reference table

Note: Refer to "Location diagrams of the RS/6000 SP components" on page 2-3 for figures showing physical locations.

FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
Thin Node Chassis				
System planar	00-00	P1		
Processor card 1	00-00	P1-C1	Processor connectors J9 and J8	CPU ID 0x00 and 0x01 (if 2-way card)
Processor card 2	00-00	P1-C2	Processor connectors J6 and J5	CPU ID 0x04 and 0x05 (if 2-way card)
Memory card 1	00-00	P1-M1	Processor connector J12	
Memory card 1 modules 1–16	00-00	P1-M1.1 through P1-M1.16	Memory card sockets J1,J2,J3,J4, J5,J6,J7,J8 J9,J10,J11,J12, J13,J14,J15,J16	Extents: 8L,8H,10L,10H, 12L,12H,14L,14H 9L,9H,11L,11H, 13L,13H,15L,15H
Memory card 2	00-00	P1-M2	Processor connector J13	
Memory card 2 modules 1–16	00-00	P1-M2.1 through P1-M2.16	Memory card sockets J1,J2,J3,J4, J5,J6,J7,J8 J9,J10,J11,J12, J13,J14,J15,J16	Extents: 8L,8H,10L,10H, 12L,12H,14L,14H 9L,9H,11L,11H, 13L,13H,15L,15H
Power mix card				
Power mix card		X4	I/O planar connector P2 System planar connectors J1, J2, J3, J4	
Thin Node I/O Components				
I/O planar	00-00	P2		
Diskette port	01-D1	P2/D1	I/O planar connector J1	0x03f0
Keyboard port	01-K1-00	P2/K1	I/O planar connector J3	0x0060

FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
Mouse port	01-K1-01	P2/O1	I/O planar connector J3	0x0060
Serial port 1	01-S1	P2/S1	No connector	0x0318
Serial port 2	01-S2	P2/S2	I/O planar connector J10	0x0218
Ethernet port	10-80	P2/E1	I/O planar connector J13 (TP) or J14 (BNC/coax)	Host bridge ID00, device 06
SCSI port 1	10-60	P2/Z1	Power interface card connector J2	Host bridge ID00, device 04
Card in slot I1 (TB3MX)	00-f1000000	P2-I1	I/O planar connector J9	
Adapter in PCI Slot I2	10-70	P2-I2	I/O planar connector J8	
Adapter in PCI Slot I3	10-68	P2-I3	I/O planar connector J7	
I/O Expansion Chassis I/O Components				
PCI expansion planar		P3		
PCI riser card [1]	20-78	P3.1 or P3-X1	PCI expansion planar connector J9	
Adapter in PCI slot I1	20-58 to 20-5F	P3-I1	PCI expansion planar connector J1	Host bridge ID01, device 01
Adapter in PCI slot I2	20-60 to 20-67	P3-I2	PCI expansion planar connector J2	Host bridge ID01, device 02
Adapter in PCI slot I3	20-68 to 20-6F	P3-I3	PCI expansion planar connector J3	Host bridge ID00, device 03
Adapter in PCI slot I4	20-70 to 20-77	P3-I4	PCI expansion planar connector J4	Host bridge ID00, device 04
Adapter in PCI slot I5	2F-00 to 2F-07	P3.1-I5	PCI expansion planar connector J5	Host bridge ID02, device 01
Adapter in PCI slot I6	2F-08 to 2F-0F	P3.1-I6	PCI expansion planar connector J6	Host bridge ID02, device 02
Adapter in PCI slot I7	2F-10 to 2F-17	P3.1-I7	PCI expansion planar connector J7	Host bridge ID02, device 03
Adapter in PCI slot I8	2F-18 to 2F-1F	P3.1-I8	PCI expansion planar connector J8	Host bridge ID02, device 04
SCSI Devices				

FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
DASD in thin node chassis - lower tray	10-60-00-0,0	P2-Z1-A0		Primary SCSI bus ID 0[1]
DASD in thin node chassis - upper tray	10-60-00-1,0	P2-Z1-A1		Primary SCSI bus ID 1[1]
DASD in I/O expansion chassis - lower tray	10-60-00-2,0	P2-Z1-A2		Primary SCSI bus ID 2[1]
DASD in I/O expansion chassis - upper tray	10-60-00-3,0	P2-Z1-A3		Primary SCSI bus ID 3[1]
DASD in I/O expansion chassis when connected to PCI adapter in slot P3-In	AB-CD-00-G, 0 Where AB-CD identifies the adapter's slot and G identifies the SCSI bus ID.	P3-In-Z1-B2.G		SCSI bus ID G[1]
Service Processor				
Service processor (SP) card		P2-X1	I/O planar connector J5	
Node Supervisor				
Node supervisor card		L1-N1	Power mix card connector J1	
Power Supply				
CPU power supply FRU		V1	Power mix card connector J5	
I/O power supply FRU		V2	Power mix card connector J5	
Fans				
Fan 1 and fan 2		F1 and F2	Fan connectors on CPU power supply FRU	
Fan 3 and fan 4		F3 and F4	Fan connectors on I/O power supply FRU	

Notes:

1. The SCSI bus ID's are the recommended values. Features installed at the manufacturing site will correspond to these IDs. Field installations may not comply with these recommendations.

POWER3 SMP Thin and Wide Node AIX and physical location code reference table

Note: Refer to “Location diagrams of the RS/6000 SP components” on page 2-3 for figures showing physical locations.

FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
Thin Node Chassis				
System planar	00-00	P1		
Processor Card 1	00-00	P1-C1	• Processor Connectors J8 (200 MHz POWER3 SMP Nodes) • Processor Connectors J6 (375 MHz POWER3 SMP Nodes)	
Processor Card 2	00-02	P1-C2	• Processor Connectors J6 (200 MHz POWER3 SMP Nodes) • Processor Connectors J8 (375 MHz POWER3 SMP Nodes)	
Memory Card 1	00-00	P1-M1	Processor Connector J3	
Memory Card 1 modules 1–16		P1-M1.1 through P1-M1.16	Memory Card Sockets J1,J2,J3,J4, J5,J6,J7,J8 J9,J10,J11,J12, J13,J14,J15,J16	
Memory Card 2	00-00	P1-M2.1 through P1-M2.16	Processor Connector J2	
Memory Card 2 modules 1–16		P1-M2.1 through P1-M2.16	Memory Card Sockets J1,J2,J3,J4, J5,J6,J7,J8 J9,J10,J11,J12, J13,J14,J15,J16	
Power mix card				
Power mix card		X4	I/O planar connector P2 System planar connectors J1, J2, J3, J4	
Thin Node I/O Components				
I/O planar		P2		
Diskette Port	01-D1	P2/D1	I/O planar connector J1	
Keyboard/mouse Port	01-K1	P2/K1	I/O planar connector J3	

FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
Serial Port 1	01-S1	P2/S1	I/O planar connector J13	
Serial Port 2	01-S2	P2/S2	I/O planar connector J12	
Ethernet Port	10-60	P2/E1	I/O planar connector J15 or J16	
SCSI Port	10-68	P2/Z1	I/O planar connector J13	
TB3MX2 Slot I1	00-fb000000	P2-I1	I/O planar connector J9	
PCI Slot I2	10-80	P2-I2	I/O planar connector J8	
PCI Slot I3	10-78	P2-I3	I/O planar connector J7	
I/O Expansion Chassis I/O Components				
PCI expansion planar		P3		
PCI Slot I1	20-58 to 20-5F	P3-I1	PCI expansion planar Connector J1	
PCI Slot I2	20-60 to 20-67	P3-I2	PCI expansion planar connector J2	
PCI Slot I3	20-68 to 20-6F	P3-I3	PCI expansion planar connector J3	
PCI Slot I4	20-70 to 20-77	P3-I4	PCI expansion planar connector J4	
PCI Slot I5	30-58 to 30-5F	P3-I5	PCI expansion planar connector J5	
PCI Slot I6	30-60 to 30-67	P3-I6	PCI expansion planar connector J6	
PCI Slot I7	30-68 to 30-6F	P3-I7	PCI expansion planar connector J7	
PCI Slot I8	30-70 to 30-77	P3-I8	PCI expansion planar connector J8	
SCSI Devices				
DASD in thin node chassis - Lower tray	10-60-00-0,0	P2-Z1-A0		Primary SCSI Bus ID 0[1]

FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
DASD in thin node chassis - Upper tray	10-60-00-1,0	P2-Z1-A1		Primary SCSI Bus ID 1[1]
DASD in I/O expansion chassis - Lower tray	10-60-00-2,0	P2-Z1-A2		Primary SCSI Bus ID 2[1]
DASD in I/O expansion chassis - Upper tray	10-60-00-3,0	P2-Z1-A3		Primary SCSI Bus ID 3[1]
DASD in I/O expansion chassis when connected to PCI adapter in slot P3-In	AB-CD-00-G, 0 Where AB-CD identifies the adapter's slot and G identifies the SCSI Bus ID.	P3-In-Z1-B2.G		SCSI Bus ID G[1]
Node Supervisor				
Node Supervisor Card		L1-N1	Power mix card connector J1	
Power Supply				
CPU power supply FRU		V1	Power mix card connector J5	
I/O power supply FRU		V2	Power mix card connector J5	
Fans				
Fan 1 and Fan 2		F1 and F2	Fan connectors on CPU power supply FRU	
Fan 3 and Fan 4		F3 and F4	Fan connectors on I/O power supply FRU	
Voltage Levels				
+5 V		I/O planar P2		
+3.3 V		I/O planar P2		
+5 V SB		I/O planar P2		
+12 V		I/O planar P2		
+5 V		I/O expansion planar P3		
+3.3 V		I/O expansion planar P3		
+12 V		I/O expansion planar P3		
-12 V		I/O expansion planar P3		
Inlet Temp		P2		

FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
Notes: 1. The SCSI bus ID's are the recommended values. Features installed at the manufacturing site will correspond to these IDs. Field installations may not comply with these recommendations.				

AIX location codes

The basic formats of the AIX location codes are:

- For non-SCSI devices/drives

  AB-CD-EF-GH

- For SCSI devices/drives

  AB-CD-EF-G,H

For planars, cards, and non-SCSI devices the location code is defined as:

```
AB-CD-EF-GH
 3  3  3  3
 3  3  3  Device/FRU/Port ID
 3  3  Connector ID
 3  devfunc Number, Adapter Number or Physical Location
 Bus Type or PCI Parent Bus
```

- The AB value identifies a bus type or PCI parent bus as assigned by the firmware
- The CD value identifies adapter number, adapter's devfunc number, or physical location. The devfunc number is defined as the PCI device number times 8, plus the function number
- The EF value identifies a connector
- The GH value identifies a port, address, device, or FRU

Adapters and cards are identified with just AB-CD

The possible values for AB are:

00	Processor bus
01	ISA bus
02	EISA bus
03	MCA bus
04	PCI bus used in the case where the PCI bus cannot be identified
05	PCMCIA buses
xy	For PCI adapters where x is equal to or greater than 1. The x and y are characters in the range of 0-9, A-H, J-N, P-Z (O, I, and lower case are omitted) and are equal to the parent bus's ibm, aix-loc Open Firmware Property.

The possible values for CD depend on the adapter/card.

For pluggable PCI adapters, CD is the device's devfunc number (PCI device number times 8, plus the function number). The C and D are characters in the range of 0-9, and A-F (hex numbers). This allows the location code to uniquely identify multiple adapters on individual PCI adapters.

For pluggable ISA adapters, CD is equal to the order the ISA cards defined/configured either by SMIT or the ISA Adapter Configuration Service Aid.

For integrated ISA adapters, CD is equal to a unique code identifying the ISA adapter. In most cases this is equal to the adapter's physical location code. In cases where a physical location code is not available, CD will be FF.

EF is the connector ID. It is used to identify the adapter's connector that a resource is attached to.

GH is used to identify a port, device, or FRU. For example:

- For async devices GH defines the port on the fanout box. The values are 00 to 15
- For a diskette drive H defines which diskette drive 1 or 2. G is always 0
- For all other devices GH is equal to 00

For integrated adapter, EF-GH is the same as the definition for a pluggable adapter. For example, the location code for a diskette drive is 01-D1-00-00. A second diskette drive is 01-D1-00-01.

For SCSI the location code is defined as:

```
AB-CD-EF-G,H
 3  3  3 3 3
 3  3  3 3 Logical Unit address of the SCSI Device
 3  3  3 Control Unit Address of the SCSI Device
 3  3  Connector ID
 3  devfunc Number, Adapter Number or Physical Location
 Bus Type or PCI Parent Bus
```

Where AB-CD-EF are the same as non-SCSI devices.

G defines the control unit address of the device. Values of 0 to 15 are valid.

H defines the logical unit address of the device. Values of 0 to 255 are valid.

There is also a bus location code that is generated as '00-XXXXXXXX' where XXXXXXXX is equivalent to the node's unit address.

Examples of physical location codes displayed by AIX are:

Processor card in slot 1 of planar 1

P1-C1

Memory module in system planar slot 2

P1-M2

Memory module 12 in card in slot 2 of system planar

U1-P1-M2.12

Examples of AIX location codes displayed are:

Integrated PCI adapter

10-80	Ethernet
10-60	Integrated SCSI Port 1

Pluggable PCI adapters

00-f100000	SP Switch MX adapter, thin node chassis slot I1
10-70 to 10-77	(332 MHz SMP node) Any PCI adapter in thin node chassis slot I2
10-68 to 10-6F	(332 MHz SMP node) Any PCI adapter in thin node chassis slot I3
10-80 to 10-87	(POWER3 SMP node) Any PCI adapter in thin node chassis slot I2
10-78 to 10-7F	(POWER3 SMP node) Any PCI adapter in thin node chassis slot I3
20-78	PCI riser card
20-58 to 20-5F	Any PCI adapter in I/O expansion chassis slot I1
20-60 to 20-67	Any PCI adapter in I/O expansion chassis slot I2
20-68 to 20-6F	Any PCI adapter in I/O expansion chassis slot I3
20-70 to 20-77	Any PCI adapter in I/O expansion chassis slot I4
2F-00 to 2F-07	(332 MHz SMP node) Any PCI adapter in I/O expansion chassis slot I5
2F-08 to 2F-0F	(332 MHz SMP node) Any PCI adapter in I/O expansion chassis slot I6
2F-10 to 2F-17	(332 MHz SMP node) Any PCI adapter in I/O expansion chassis slot I7
2F-18 to 2F-1F	(332 MHz SMP node) Any PCI adapter in I/O expansion chassis slot I8
30-58 to 30-5F	(POWER3 SMP Thin and Wide node) Any PCI adapter in I/O expansion chassis slot I5
30-60 to 30-67	(POWER3 SMP Thin and Wide node) Any PCI adapter in I/O expansion chassis slot I6
30-68 to 30-6F	(POWER3 SMP Thin and Wide node) Any PCI adapter in I/O expansion chassis slot I7
30-70 to 30-77	(POWER3 SMP Thin and Wide node) Any PCI adapter in I/O expansion chassis slot I8

Integrated ISA adapters

01-D1	Diskette adapter
01-S1	Serial port 1 adapter
01-S2	Serial port 2 adapter

Non-integrated ISA adapters

01-01	First ISA card defined/configured
01-02	Second ISA card defined/configured

Device attached to SCSI controller

10-60-00-4,0	Device attached to Integrated SCSI Port 1

Power/keylock status register (PKSR)

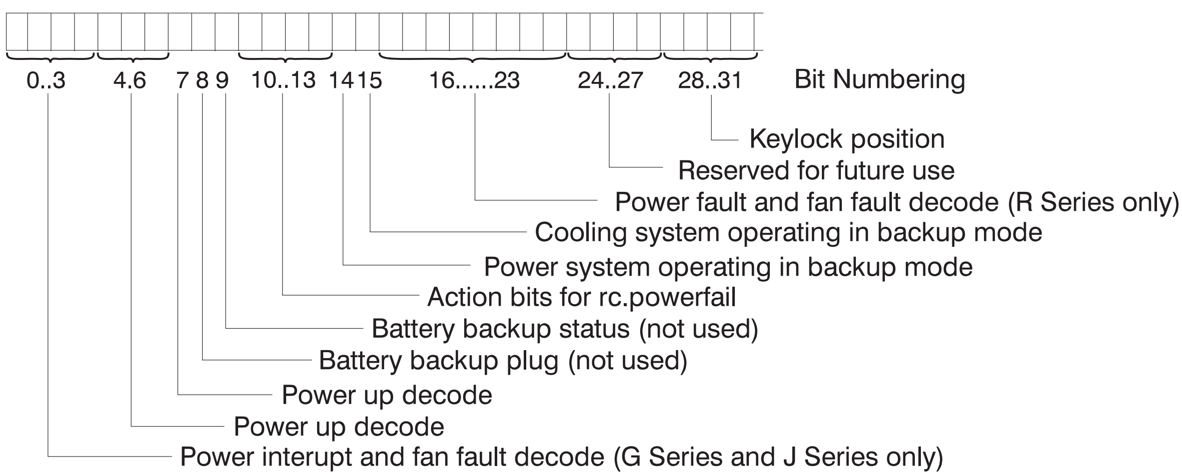
When a failure occurs on a fan or on a power supply, the system produces a logging report for this event. The logging report can be viewed using **errpt**.

An errpt report about power and fan is the following:

```
LABEL:                 EPOW_SUS
Description:           LOSS OF ELECTRICAL POWER
Probable Causes:       POWER SUBSYSTEM
                       INTERNAL POWER UNIT
Failure Causes:        POWER SUBSYSTEM
RECOMMENDED ACTIONS:   CHECK POWER
POWER STATUS REGISTER:  9005 0007
```

The Power/Keylock Status Register has the following format:

PKSR Layout



Understanding PKSR

The PKSR status is logged in hexadecimal value: 8 digits are logged. Each hexadecimal digit must be converted in 4 binary digits: 32 bits are obtained. Divide the bits as indicated in the PKSR layout and check the bit values to understand the meaning of the register.

Example: Suppose you receive an error message whose PKSR content in hex is:

```
9005 007
```

converted to binary:

```
1001 000 0 0 0 0001 0 1 00000000 0000 0111
0  3 4 6 7 8 9 10 13    16    23 24   28 31 = Bit Numbering
```

This means that the following events occurred:

- fan 1 fault
- a warning cooling message is displayed on the console
- the cooling system is operating in backup mode
- the key is in normal position

PKSR values

Power interrupt and fan fault

Bits 0-3 Values	Description
0000	No Interrupt
0001	Running on battery
0010	Programmed Power Off
0011	Manual switch off
0100	Remote power off
0101	Over temperature level 1
0110	Internal power supply failure
0111	Power supply overload
1000	Loss of Primary power (EPOW)
1001	Fan 1 fault
1010	Fan 2 fault
1011	Fan 3 fault
1100	Fan 4 fault
1100	Fan 5 fault
1100	Fan 6 fault
1111	Reserved

Power up

Bits 4-6 Values	Description
000	Manual On button pushed
001	Remote On signal from external
010	Timed power on from TOD clock
011	Remote on signal from power control interface
100	Automatic restart

Power up

Bit 7 Values	Description
0	No thermal warning
1	Thermal warning

Battery status

Bit 8 Values	Description
0	Backup battery not installed
1	Backup battery installed

Battery status

Bit 9 Values	Description
0	Backup battery OK (if installed)
1	Backup battery discharged or failing

Power interrupt (action for rc.powerfail)

Bits 10-13 Values	Description
0000	No action
0001	WARN_COOLING no reaction
0010	WARN_POWER error logging
0011	Severe cooling problem, SLOW_SHUTDOWN 10 minutes to shutdown
0100	Very severe cooling problem, FAST_SHUTDOWN 20 sec to shutdown
0101	IMMED_SHUTDOWN immediate power down

Power system operating in backup mode

Bit 14 Values	Description
0	No power warning
1	Power system operating in backup mode warning

Cooling system operating in backup mode

Bit 15 Values	Description
0	No cooling warning
1	Cooling system operating in backup mode warning

Power fault and fan fault (R30, R40, and R50)

Bits 16-23 Values	Description
00000000	No Interrupt
00000001	Over temperature level 1 on power supply #1
00000010	Over temperature level 2 on power supply #1
00000011	Internal power supply failure on power supply #1
00000100	Power supply #1 overload
00000101	Loss of primary power on power supply #1
00000110	Over temperature level 1 on power supply #2
00000111	Over temperature level 2 on power supply #2
00001000	Internal power supply failure on power supply #2
00001001	Power supply #2 overload
00001010	Loss of primary power on power supply #2
00010000	Fan 1 fault
00100000	Fan 2 fault
00110000	Fan 3 fault
01000000	Fan 4 fault
01010000	Fan 5 fault
01100000	Fan 6 fault
01110000	Fan 7 fault
10000000	Fan 8 fault
10010000	Fan 9 fault
10100000	Fan 10 fault

Keylock position

Bits 28-31 Values	Description
0101	Secure
0110	Service
0111	Normal

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(Auszug aus dem EMVG vom 9.Nov.92, Para.3, Abs.4)

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RS/6000 SP
SMP
Thin and Wide Node
Service Guide

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