RS/6000 SP

Maintenance Information Volume 2, Maintenance Analysis Procedures

GA22-7376-01

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Note!

Before using this information and the product it supports, be sure to read the general information under “Notices” on page ix.

Second Edition (February 1999)

This is a major revision of GA22-7376-00.

This edition applies to the IBM RS/6000 SP Systems, Version 3 Release 1 of IBM Parallel System Support Programs for AIX (5765-529), which runs on IBM RS/6000 SP, and to all subsequent releases and modifications until otherwise indicated in new editions.

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Safety Notices

RS/6000 SP: Maintenance Information, Volume 1 contains a list of all safety notices pertaining to SP hardware maintenance from Volumes 1, 2, 3, and 4.

Translations of these notices are also provided in Volume 1.

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.

Electronic Emissions Notices

Federal Communications Commission (FCC) Statement

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

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

European Union (EU) Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

United Kingdom Telecommunications Safety Requirements

Notice to Customers

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunications systems in the United Kingdom.

Industry Canada Compliance Statement

This Class A digital apparatus meets the requirements of the Canadien Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

For Installations in Japan:

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The following is a summary of the VCCI Japanese statement in the box above. This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

Electromagnetic Interference (EMI) Statement - Taiwan

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user will be required to take adequate measures.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit Dem deutschen EMVG vom 9.Nov.92 das EG–Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse A. Für diese von Geräten gilt folgende Bestimmung nach dem EMVG:

Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministers für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind.

(Auszug aus dem EMVG vom 9.Nov.92, Para.3, Abs.4)

Hinweis

Dieses Genehmigungsverfahren ist von der Deutschen Bundespost noch nicht veröffentlicht worden.

About This Book

This book is to help you, as a customer engineer:

- Isolate RS/6000 SP failures (as well as 9076 SP1 failures in an SP1/SP2 environment
- Perform isolation and verification tests and identify field replaceable unit (FRU) locations

This book is to be used with:

- *IBM RS/6000 SP: Maintenance Information, Volume 1, Installation and Relocation* (GA22-7375), (referred to, throughout this publication, as *RS/6000 SP: Maintenance Information, Volume 1*). Volume 1 contains information to help you Identify RS/6000 SP frame types and components, perform installation and relocation procedures, and maintenance agreements and qualifications.
- *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* (GA22-7377), (referred to, throughout this publication, as *RS/6000 SP: Maintenance Information, Volume 3*). Volume 3 contains information to help you perform isolation and verification tests, identify field replaceable unit (FRU) locations, and remove and replace FRUs.
- *IBM RS/6000 SP: Maintenance Information, Volume 4, Parts Catalog* (GA22-7378), (referred to, throughout this publication, as *RS/6000 SP: Maintenance Information, Volume 4*). Volume 4 contains a list of RS/6000 SP parts and FRUs with corresponding figures that contain indexed descriptions and part numbers.

For a list of other SP books and related information, see the bibliography in the back of *RS/6000 SP: Maintenance Information, Volume 1*.

Who Should Use This Book

This book is intended for the product-trained Customer Engineer (CE). The procedures for RS/6000 SP and feature components described in this book represent a part of the overall support structure of the RS/6000 SP product. This book is intended to support the RS/6000 SP product and SP1/SP2 coexistence systems, in which SP2 code is utilized. The SP1 version of this book (*IBM 9076 Scalable POWERparallel Systems: Maintenance Information*, SY66-0299) should be used for ordering SP1 parts, or if SP1 code is utilized.

User's Responsibilities

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

How to Use This Book

When performing RS/6000 SP maintenance, follow Chapter 1, “Maintenance Analysis Procedures (MAPs)” on page 1-1.

Beginning with the “MAP 0100: Start of Service Call” on page 1-4, isolate the problem to one or more of these RS/6000 SP components:

- Supervisor Subsystem

- Processor Node
- Power Subsystem
- High Voltage Transformer (World Trade)
- Ethernet Local Area Networks (LANs)
- High-Performance Switch
- Micro Channel or PCI Adapter

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

Getting More Information

This book and other RS/6000 SP hardware and software documentation are available both online and in hardcopy from:

- The RS/6000 website at **http://www.rs6000.ibm.com**
- The Resource Center on the PSSP product media
- The Service Information Library (SIL)
- Hardcopy and CDROM versions orderable from IBM
- IBM internal use versions available on MKTTOOLS

For details, see the bibliography in *RS/6000 SP: Maintenance Information, Volume 1*.

Summary of Changes

GA22-7376-00

This edition, along with GA22-7377-00 and GA22-7378-00, replaces GC23-3904-08 and makes it obsolete. Changes found in this edition include:

- Added SP-attached server (RS/6000 Machine Type 7017-S70 and S7A) node information.
- The Maintenance Information manuals, Volumes 1, 2, and 3, (GC23-3903 and GC23-3904) were reorganized into 4 volumes:
  - *IBM RS/6000 SP: Maintenance Information, Volume 1, Installation and Relocation*, GA22-7375-00
  - *IBM RS/6000 SP: Maintenance Information, Volume 2, Maintenance Analysis Procedures*, GA22-7376-00
  - *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, GA22-7377-00
  - *IBM RS/6000 SP: Maintenance Information, Volume 4, Parts Catalog*, GA22-7378-00

GA22-7376-01

This edition replaces GA22-7376-00 and makes it obsolete. Changes found in this edition include:

- Added POWER3 SMP thin and wide node information.

Chapter 1. Maintenance Analysis Procedures (MAPs)

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

Safety Notices

The following practices are necessary to ensure safety of all service personnel while servicing this machine.

Lockout Procedures

Lockout Procedure for SEPBU

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.

1. Make sure the main power switch is in the Off (‘0’) position for this frame.
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 Z1 and Z2. Repeat measurement for test points Z1 and Z3. Repeat measurement between test points Z2 and Z3.
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. Continue with Step 5 of “Lockout/Tagout Procedure for PDU” or “Lockout/Bagout Procedure for PDU” on page 1-3.

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

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.

MAP 0100: Start of Service Call

This MAP is the starting point for all service calls. It directs you to other MAPs and service information. Refer to Chapter 2 for locations.

001

Read the following notes before continuing:

Attention: Processor nodes should never be powered-on without the top cover seated in its normal position to protect internal components.

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.

Attention: Components in the frame are susceptible to damage from static discharge. Always use an ESD wristband when working inside frame covers.

Attention: The MAPs explain restrictions for performing concurrent maintenance on the system. Notify customer where indicated before disconnecting or powering-down parts of the system so that critical information/applications of the customer will not be lost during maintenance/repair.

Attention: Servicing processor nodes with the switch assembly feature (parallel environment) requires that parallel processing must be stopped before removing the nodes from the active configuration. Powering off processor nodes without removing them from the active partition will cause all parallel jobs in that partition to terminate and switch initialization to rerun.

- **Problem Determination** (found in *IBM Parallel System Support Programs for AIX: Diagnosis Guide* should be performed before using the following MAPs to reduce the likelihood that the problem is due to a software or user error.
- When you need to power-off a processor node, which has not previously been shut down or flashing **888**, check with the Customer to see if the node can be fenced and shut down; otherwise, maintenance must be deferred.
- **Concurrent service operations** can be done on the following boundaries without interfering with operation of other parts of the system:
  - Bulk power supply or power module (only one can be removed at a time)
  - Frame supervisor card
  - Processor node (only when not in the active configuration)
  - Switch with partitions—for service within a partition, see "Viewing Switch Partitions" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
- For additional information, check the error log(s) of the failing node(s) by issuing the following command from an AIX window open for that node:

  errpt -a | pg

  See Step 002 on page 1-5 for more information and notes concerning the **errpt** command.
- When a MAP instructs you to replace a FRU, use "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* and the specific instructions for removing and replacing that part to ensure that the proper procedure is used. Be sure to observe danger, caution, and attention notices.

– Features may be installed in this product that are not covered in the following MAPs. Should the following diagnostics fail to resolve the field problem, refer to the documentation that came with the installed features for further diagnostic information.
– If the control workstation hardware is not operating correctly, refer to the appropriate workstation diagnostic manual. Otherwise, go to Step 002.

002

– Check for the existence of the high availability control workstation (HACWS) by looking at the frame supervisor card. Verify the twin tail RS/232 cable hook-up needed for HACWS.

  Note: The twin tail frame supervisor card is also needed for frames supporting the SP Switch or for frames containing 604 or 604e high node(s).

– Start either Perspectives or the System Monitor:

Perspectives

On the command line of the control workstation, type **sphardware** and press **Enter**, to start Perspectives. Refer to the Perspectives information in *IBM RS/6000 SP: Administration Guide*, GC23-3897.

System Monitor

Ensure that the system monitor software is active on the control workstation by following the procedures below. Refer to the System Monitor information in *IBM RS/6000 SP: Administration Guide*, GC23-3897.

1. Check for a window labeled “System Monitor”.
2. If the window is not found, look for an icon (small box) labeled “disp_in:” or “disp_mgr”; click on the icon to raise the window.
3. If no window appears, click on an active AIX window and enter:

   spmon -g

   Open the “**3 Digit Display**” window by following these procedures:
   a. From “Display Manager” or “System Monitor” window, click on “**SP**”.
   b. From the pulldown menu, click on the “All Node Summary Display” option.
   c. From the “Available Variables” menu, click on “3-Digit Display”, then click on the “Display All Node Summary” button.

– Open a TTY window, if possible, to the failing node. Real-time error data can be observed that can help with problem determination and repair.
– Check the boot Ethernet and switch communication status by issuing the following command from the control workstation:

  SDRGetObjects host_responds (Ethernet)

  SDRGetObjects switch_responds (Switch)

  A value of "**0**" for **host_responds** or **switch_responds**, for any node, indicates a communication problem (this may be the result of some other hardware problem).
– Check for system monitor, node, and switch errors by issuing one or more of the following commands from an AIX window:

Check Status of:	Issue Commands on:	Commands:
SP hardware	Control workstation	**errpt -a -N sphwlog | pg**
Affected node	Node's TTY console or "**tn** *HOSTNAME*"	**errpt -a | pg**
Switch links	Primary node's TTY console or "**tn** *HOSTNAME*" (use **splstdata -s** to identify HOSTNAME)	**errpt -a -N Worm | pg** **pg /var/adm/SPlogs/css/out.top**
Dependent node	Control workstation	**SDRGetObjects DependentNode**

Notes:

1. The most recent entry is found at the *top* of **errpt**
2. When viewing the error log using the **pg** command, the following options may be entered at the colon (:) prompt:

   $ Jumps to end of output (to view oldest entries of **errpt**
   + Jumps one page forward
   – Jumps one page backward
   # Jumps to line number # of the file (first line is 1)

3. Refer to "Checking Errors Using “errpt”" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for more information on using the **errpt** command.
4. Check the date/time stamp of the log entries for updated information. Be aware that conditions may have been cleared, as indicated by “Condition cleared” in the message.
5. Note that “node17” or “slot17” refers to a switch assembly in the position below processor nodes 1 and 2.

– The following table contains a **prioritized** list of conditions. Find the **first** condition that describes your problem, then perform the suggested action.

Priority	Condition	Action
1	Control workstation hardware not operating correctly.	Go to RS/6000 MAPs to service the control workstation.
2	System monitor (errpt) reports supervisor problem: • “Frame Controller does not respond...” • “Frame supervisor does not respond” • “Supervisor bus failed for node...” • “Node supervisor does not respond” • “Supervisor bus failure” • Perspectives/spmon not responding to frame or node	Go to “MAP 0110: Supervisor Subsystem” on page 1-10.
3	Problem with entire frame: • System monitor (errpt/not topology) reports hardware problem associated with frame(s). • Problem with frame power.	Go to “MAP 0370: Main Power” on page 1-222.

Priority	Condition	Action
4	Problem with frame supervisor green LED number 2 flashing.	Go to “MAP 0430: dc Power Loss from Bulk dc Power Supply(s)” on page 1-250.
5	Processor node LED/LCDs or 8-digit display on TTY window are not blank (OK = blank).	**Thin, Wide, or High Node:** Go to “MAP 0190: Processor Node Function” on page 1-87. **332 MHz and POWER3 Symmetric MultiProcessor (SMP) Thin or Wide Nodes:** Go to “332 MHz SMP and POWER3 SMP Thin and Wide Node Messages and Codes” in *RS/6000 SP: Maintenance Information, Volume 3*. **Note:** Some nodes may show “standby” or message in LED/LCD.
6	Problem with processor node: • TTY console and/or system monitor (errpt/not topology) reports a hardware problem for processor node(s) (slots 1-16). • **Uniprocessor (Thin/Wide Node)** – Yellow LED on or flashing. – Green LED off or flashing. • **SMP (Thin/Wide/High Node)** – Supervisor LED #1 flashing (green) – Supervisor LED #5 flashing (yellow) • Problem with node power.	Go to “MAP 0130: Processor Node” on page 1-30.
7	Problem with switch assembly or communication: • System monitor (errpt) reports a hardware problem for switch assembly (slot 17). • Yellow LED on or flashing. • Green LED off or flashing. • switchResponds is "**0**" for nodes. • switchResponds = YELLOW • Primary node **errpt -a -N Worm** lists problems. • Problem identified in **out.top** file. • Problem with dependent node connection to switch.	Go to “MAP 0510: Switch Assembly” on page 1-294.
8	Network problem reported by “Topology” window, GUI, or customer. • Ethernet (en) — **hostResponds** not green • Switch (css) — **switchResponds** not green • Token Ring (tr) • FDDI (fi)	Go to “MAP 0490: Network Problem” on page 1-286.
9	Block Multiplexer Channel Adapter problem detected by customer.	Go to “MAP 0560: Block Multiplexer Channel Adapter (BMCA)” on page 1-353.

Priority	Condition	Action
10	One of the following problems detected by the customer or customers' EREP program: • I/O adapter problem (other than BMCA). If this is a SPS adapter problem in a 135 MHz wide node at PSSP level 2.3 or below, first check to ensure that the SPS adapter is plugged into an I/O bus 0 slot (preferably slot 0/4). • If this is a 332 MHz SMP node, ensure the SPS adapter cable is plugged into port P0. • Memory and/or processor problem **(for 604e high nodes, ensure that memory DIMM types are not mixed on individual memory cards or on the node)**. • SCSI/HDISK or other device problems. (For 604 and 604e high nodes, refer to the media drawer diagram in "Removing the 604 or 604e High Node DASD" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* showing the SCSI path and power cable.)	1. Check the processor node for any additional errors reported. (Look in **errpt -a | pg** on the affected node.) If possible, run **diag -a** to check for missing or additional devices. **If any SRN is logged, find the equivalent RS/6000 model in Table 1-6 on page 1-33. Then locate the SRN table in** *Diagnostic Information for Micro Channel Bus Systems* **(SA38-0532).** or *Diagnostic Information for Multiple Bus Systems* (SA38-0509). 2. Have the customer remove the processor node from the active configuration and SHUTDOWN the node. 3. IPL the processor node in SERVICE mode. Refer to "Running Diagnostics in a Processor Node" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 4. Run diagnostics against the suspected card. Refer to *Diagnostic Information for Micro Channel Bus Systems* (SA38-0532) or *Diagnostic Information for Multiple Bus Systems* (SA38-0509) and the *Adapters, Devices and Cable Information* (SA38-0533). Refer to *RS/6000 SP: Maintenance Information, Volume 3* for processor node locations and removal and replacement procedures, or *RS/6000 SP: Maintenance Information, Volume 4* for part numbers, as required. (For 604 or 604e high processor nodes, consult the *7015 Models R30, R40, and R50 CPU Enclosure Installation and Service Guide* and *7015 Supplemental Information*.) **Note:** When diagnosing problems on 604 or 604e high nodes, place IPL in "long IPL boot". (See “MAP 0280: 604 or 604e High Node Minimum Configuration” on page 1-145.) 5. If no problem is found and no service was taken, the problem may be in the software or attached hardware. 6. If parts were just repaired or replaced, go to Step 001 on page 1-4. 7. Return processor node to NORMAL mode. Power off/on the processor node to IPL. 8. Go to “MAP 0570: End of Call” on page 1-357.
11	Processor node or switch assembly is not recognized by system monitor: • Display shows an empty box for this processor node or switch assembly.	Go to “MAP 0120: Supervisor Bus Problem” on page 1-19 to service this processor node or switch assembly.

Priority	Condition	Action
12	Processor node problem detected by customer or CE: • 3-digit LEDs displayed but missing segments or remain blank • Processor node will not reset • No response from TTY console • Mode switch problem • Yellow or green LEDs on processor node will not light.	Go to “MAP 0170: Thin Processor Node Control” on page 1-74, “MAP 0230: Wide Processor Node Control” on page 1-110, “MAP 0270: 604 or 604e High Node Control” on page 1-135, or “MAP 0310: 332 MHz SMP Node Control” on page 1-177, depending on the type of processor nodes. For 604 or 604e high processor nodes, consult the *7015 Models R30, R40, and R50 CPU Enclosure Installation and Service Guide* and *7015 Supplemental Information* For SP-attached servers (RS/6000 Machine Type 7017-S70 and S7A), check the server to SP connection cables for correct plugging. Refer to "Installing SP-Attached Server Cables" in *RS/6000 SP: Maintenance Information, Volume 1*. Consult the *RS/6000 Enterprise Servers S70 and S7A Installation and Service Guide* to perform the required service action. **Note:** Before disconnecting cables or performing service actions on an SP-attached server, perform "Decoupling and Coupling Code for SP-Attached Servers" in *RS/6000 SP: Maintenance Information, Volume 3*.
13	Dependent node or SP switch router adapter problem (other than switch connection) detected by customer.	Service required on 9077 switch router (dependent node). Use *SP Switch Router Adapter Guide*, shipped with the 9077, to continue problem determination.
14	Other problems affecting operation of the system.	Call next level of support.

MAP 0110: Supervisor Subsystem

The supervisor subsystem consists of the following components:

- Node supervisor card (one per processor node)
- Switch supervisor card (one per switch assembly)
- Internal cable (one per thin processor node or switch assembly)
- Supervisor bus card (one per thin processor node or switch assembly)
- Supervisor harness (two per frame)
- Supervisor jumper cables (two per frame—PDU only)
- Connector card (PDU only)
- Backplane card (PDU only)
- Frame supervisor card
- Serial cable (RS-232)
- SAMI cable

Table 1-1. 8-LED Frame Supervisor LED Definitions

LED #	Color	Signifies
8	Yellow	Control workstation current communication status (S1-RS232 data terminal ready line): • Momentarily On: Communication active • Flashing: Problem—cannot communicate with control workstation
7	Yellow	Control workstation current communication status (S2-RS232 data terminal ready line): • Momentarily On: Communication active • Flashing: Problem—cannot communicate with control workstation in a HACWS configuration. In a configuration without HACWS, a flashing LED 7 is normal. • Off: Communication inactive **Note:** Be aware that there may be communications to the inactive control workstation
6	Yellow	Supervisor bus communication status: • Flashing: Problem—no communication with processor node(s) or switch assemblies • Off: Communication okay
5	Yellow	Not Used
4	Green	Connection S1 to primary control workstation • On: Active • Off: Inactive
3	Green	Connection S2 to secondary control workstation • On: Active • Off: Inactive
2	Green	Bulk 48 V dc power status: • On: All 48 V dc power supplies operating okay • Flashing: 48 V dc power supply problem • Off: No 48 V dc power available
1	Green	Supervisor power status: • On: Supervisor power present • Off: No supervisor power

Refer to Figure 1-2 on page 1-12 and Figure 1-3 on page 1-13 to view the supervisor subsystem for the PDU and SEPBU, respectively.

Table 1-1 and Figure 1-1 on page 1-11 show the twin tail frame supervisor LED definitions.

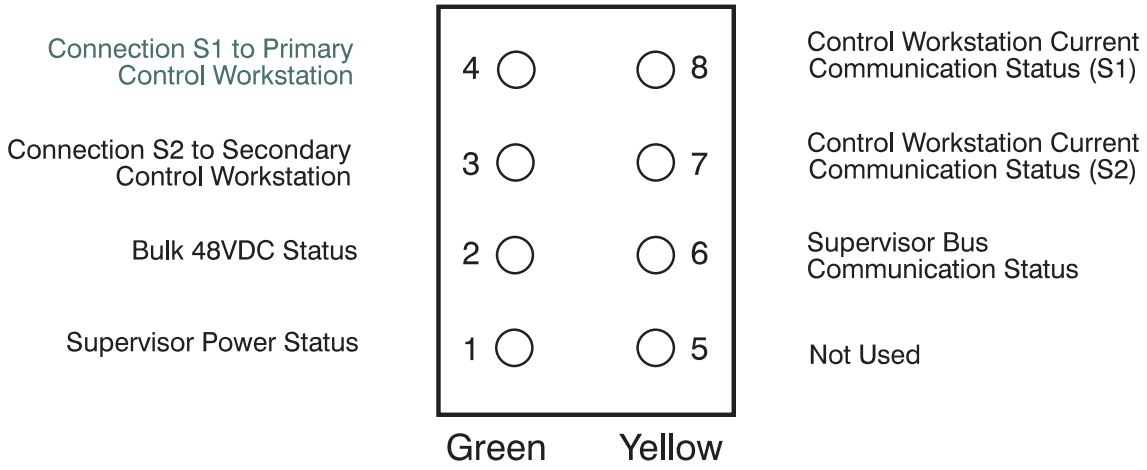

Figure 1-1. 8-LED Frame Supervisor Card LEDs

Note: For LEDs #3 and #4, only one communication S1 or S2 is active, while the other one is inactive.

Table 1-2 shows the frame supervisor LED definitions:

Table 1-2. 4-LED Frame Supervisor LED Definitions

LED #	Color	Signifies
4	Yellow	Supervisor bus communication status: • Flashing: Problem: No communication with processor node(s) or switch assemblies • Off: Communication okay
3	Yellow	Control workstation current communication status: • On: Communication active (momentary) • Flashing: Problem—cannot communicate with control workstation • Off: Communication inactive
2	Green	Bulk 48 V dc power status: • On: All 48 V dc power supplies operating okay • Flashing: 48 V dc power supply problem • Off: No 48 V dc power available
1	Green	Supervisor power status: • On: Supervisor power present • Off: No supervisor power

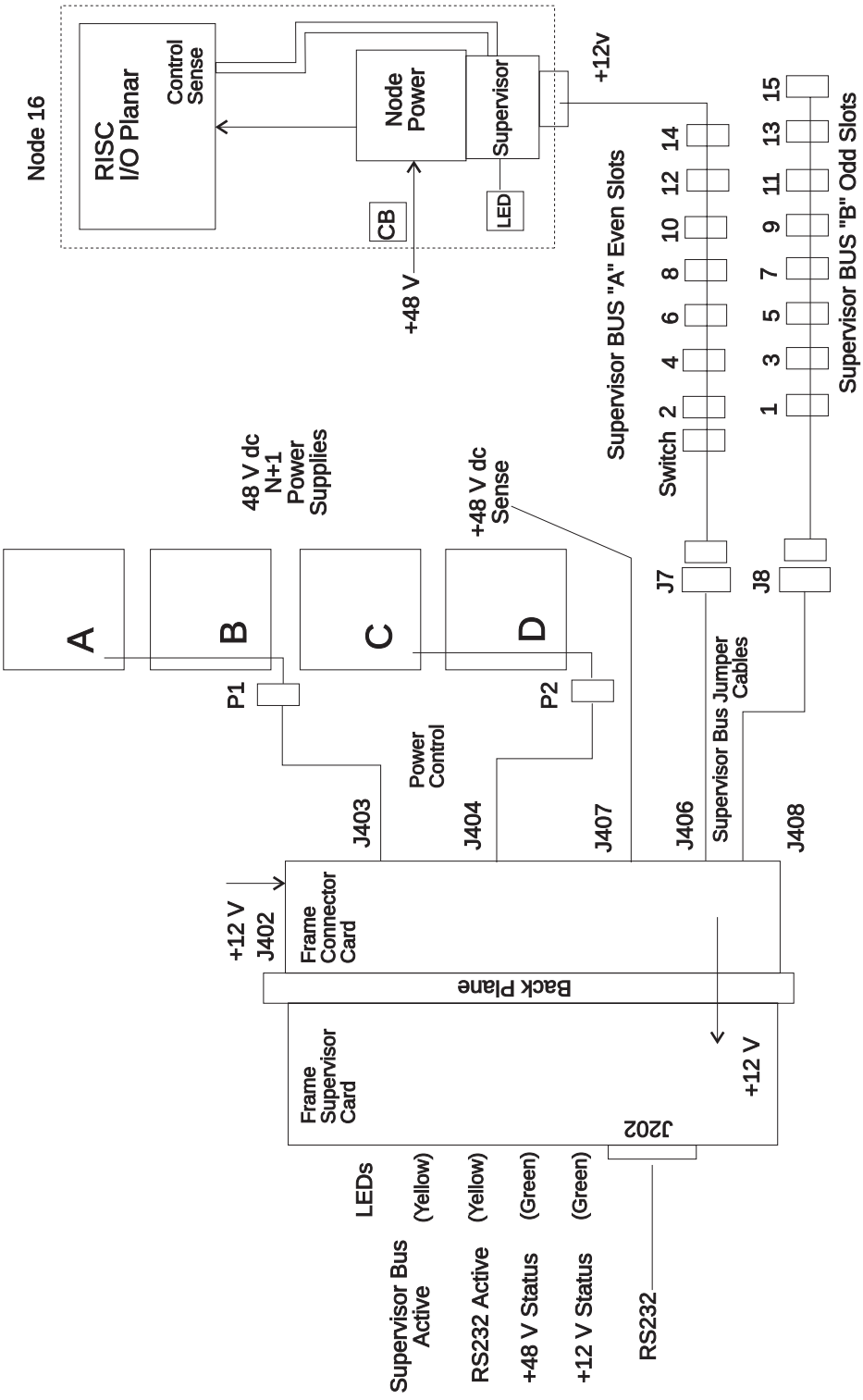

Figure 1-2. RS/6000 SP Supervisor Subsystem Diagram (PDU)

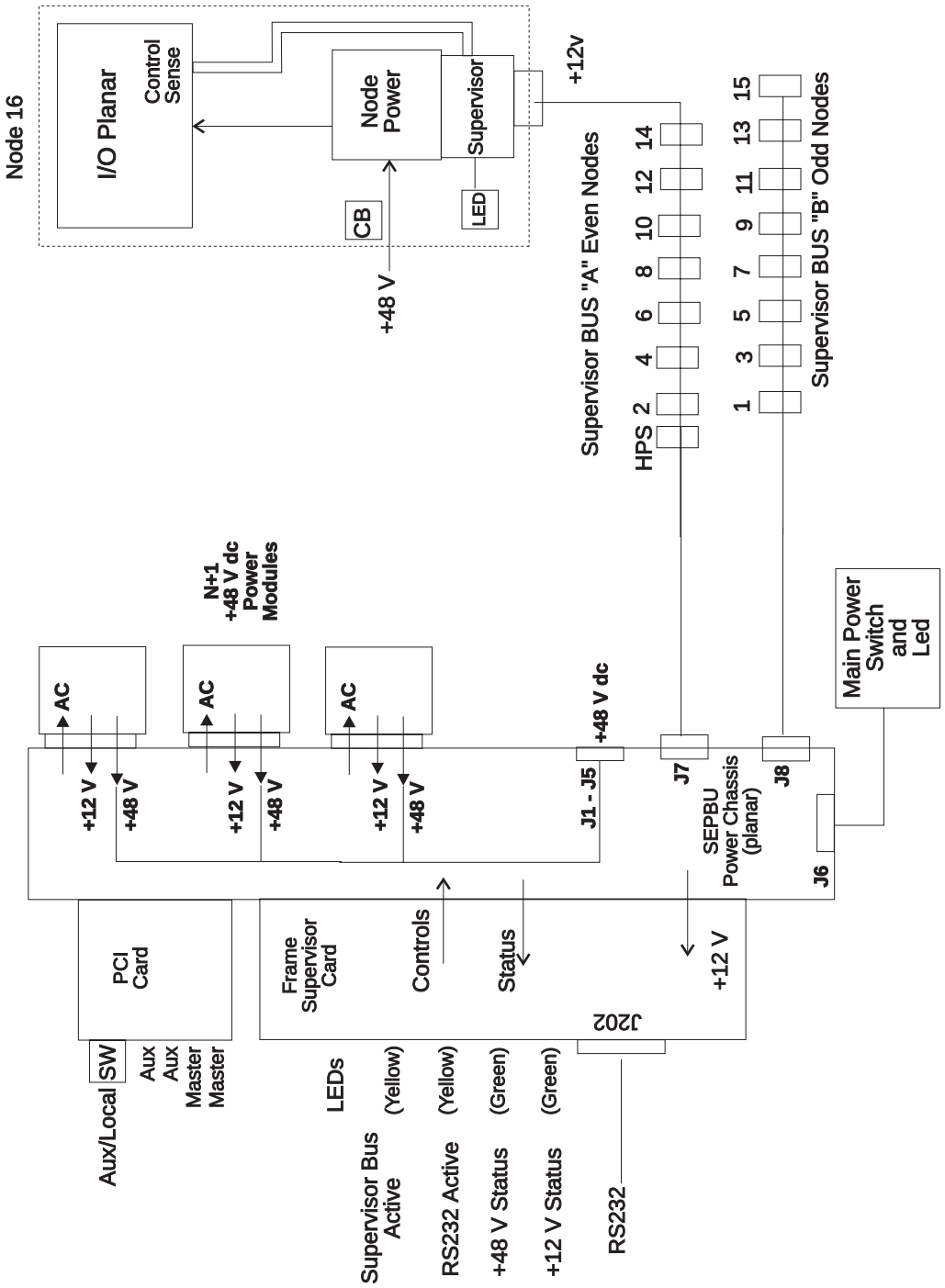

Figure 1-3. RS/6000 SP Supervisor Subsystem Diagram (SEPBU)

001

– Check hardware monitor log on control workstation for error messages.
– The following table contains a prioritized list of conditions. Find the first condition that describes your problem, then perform the suggested action:

Priority	Condition	Action
1	• "Frame Controller does not respond" • "Frame supervisor does not respond" • Frame Controller shows red • spmon/perspectives obviously not responding	Go to Step 002 on page 1-14.
2	• "nodefail1" • Frame controller toggles red/green	For SP-attached servers (RS/6000 Machine Type 7017-S70 and S7A), check the server to SP connection cables for correct plugging. Refer to "Installing SP-Attached Server Cables" in *RS/6000 SP: Maintenance Information, Volume 1*. Consult the *RS/6000 Enterprise Servers S70 and S7A Installation and Service Guide* to perform the required service action. Otherwise, go to "MAP 0120: Supervisor Bus Problem" on page 1-19. **Note:** Before disconnecting cables or performing service actions on an SP-attached server, perform "Decoupling and Coupling Code for SP-Attached Servers" in *RS/6000 SP: Maintenance Information, Volume 3*.
3	• "Supervisor bus failed for node..." • "Supervisor not responding for slot" **Note:** "nodefail#" indicates a problem with slot address # (for example, nodefail5 indicates a problem with slot address 5). • "Supervisor bus failure" • Node supervisor not responding to commands.	Go to "MAP 0120: Supervisor Bus Problem" on page 1-19.

002

Frame supervisor not responding.

– Check frame supervisor card LEDs. The frame supervisor card is located on the left-hand side of the Power Distribution Unit.

Are any of these LEDs lit?

Yes **No**

003

– Check LEDs on front of processor node(s) and/or switch assemblies. If none are lit, detach supervisor harness from one processor node or switch assembly, then reinsert to initiate node supervisor self-test.

(Step **003** continues)

003 (continued)
Were any LEDs on any processor node or switch assembly lit before or during this step?
Yes **No**

004

No supervisor power 12 V dc available.
– Go to "MAP 0370: Main Power" on page 1-222.

005

Frame supervisor card has power problem.

Note: If this frame has a PDU, you will have to remove the cover from the PDU dc section.

– Replace the frame supervisor card (refer to "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*).
– Check LEDs on frame supervisor card.
Are any LEDs lit on frame supervisor card?
Yes **No**

006

Problem with supervisor power 12 V dc.
– Go to "MAP 0370: Main Power" on page 1-222.

007

– Go to Step 033 on page 1-18.

008

Is frame supervisor LED #3 (yellow LED) or LED #7 or #8 (when there is a twin-tail frame supervisor card) flashing?
Yes **No**

009

Is frame supervisor LED #2 (green LED) flashing?
Yes **No**

010

– Go to "MAP 0120: Supervisor Bus Problem" on page 1-19.

011

– Go to "MAP 0370: Main Power" on page 1-222.

012

– Check for a serial cable connection problem. The serial cable is connected between the frame supervisor card and the control workstation.
(Step **012** continues)

012 (continued)
Is the cable connected?
Yes **No**

013

Is the HACWS feature being used?
Yes **No**

014

– Go to Step 020.

015

Is LED #7 or #8 momentarily on?
Yes **No**

016

– Go to Step 020.

017

Is LED #3 or #4 on?
Yes **No**

018

– Go to Step 020.

019

– Change card.
– Go to Step 023.

020

– Connect cable.
– Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does verification test pass?
Yes **No**

021

– Go to Step 023.

022

– Go to “MAP 0570: End of Call” on page 1-357.

023

– Disconnect serial cable PDU-BH-J09 from frame supervisor card.
– Install wrap plug (p/n 6298964) on the frame end of the serial cable.
(Step **023** continues)

023 (continued)
– Locate the port on the multi-port interface or control workstation connected to this serial cable.
– Run the serial port wrap test on this serial port. Refer to the RS/6000 MAPs located in *Diagnostic Information for Micro Channel Bus Systems* (SA38-0532).

Did the wrap test pass with this serial cable?

Yes **No**

024

Cable wrap test failed.
– Install wrap plug (may be p/n 6298966) on this serial port of the control workstation.
– Rerun the serial port wrap test.

Did the wrap test pass without this serial cable?

Yes **No**

025

Problem isolated to serial port of control workstation (not RS/6000 SP).
– Go to “MAP 0570: End of Call” on page 1-357.

026

– Replace serial cable and repeat cable wrap test.

Did wrap test pass with new serial cable?

Yes **No**

027

– Call next level of support.

028

– Connect serial cable to frame.
– Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does verification test pass?

Yes **No**

029

Problem with frame supervisor card.
– Go to Step 031.

030

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

031

Problem with frame supervisor card.

Note: If this frame has a PDU, you will have to remove the cover from the PDU dc section.

– Replace the frame supervisor card (refer to "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*).

(Step **031** continues)

031 (continued)

– Perform all tests of "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does verification test pass?

Yes **No**

032

– Call next level of support.

033

Problem resolved.

– If this frame has a PDU, reinstall cover for PDU dc section.

– Go to “MAP 0570: End of Call” on page 1-357.

MAP 0120: Supervisor Bus Problem

001

One or more of the following messages appears in the log:

"Supervisor bus failed for node..."
"Supervisor not responding for slot"
"Supervisor bus failure"
OR "spmon/perspectives obviously not responding"

– The following table contains a prioritized list of conditions. Find the first condition that describes your problem, then perform the suggested action:

Priority	Condition	Action
1	• All node and switch supervisors in frame have one of the above messages in the log. • Have "Supervisor bus failure" message. • LED #4 (top yellow LED) or LED #6 (if a twin-tail frame supervisor card is being used) is flashing. • spmon/perspectives obviously not responding.	Go to Step 002.
2	• Single node or switch has one of the above messages in the log. • Single node or switch has a failure symptom received from running verification tests or supervisor self-test. • Display shows an empty box (slot position is not shown/recognized) for this processor node or switch assembly. • Node supervisor self test fails.	Go to Step 029 on page 1-23.
3	Multiple nodes and/or switches have one of the above messages in the log.	Go to Step 044 on page 1-27.

002

Problem communicating with all node and switch supervisors in frame.
– Check frame supervisor serial connection PDU-BH-J09 (located at rear of Power Distribution Unit section) and frame supervisor card for an obvious problem such as a loose connection or damaged component.

Does everything appear okay?

Yes **No**

003

– Fix connection problem or replace damaged component.
(Step **003** continues)

003 (continued)

– Perform all tests of "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does this verification test pass?

Yes **No**

004

Restart this MAP at Step 001 on page 1-19.

005

Problem resolved.

– Go to "MAP 0570: End of Call" on page 1-357.

006

– Check frame supervisor LED #4 (top yellow LED) or frame supervisor LED #6 (if a twin-tail frame supervisor card is being used).

Is frame supervisor LED #4 or LED #6 (twin-tail) flashing?

Yes **No**

007

Probable defective frame supervisor card, or incorrect supervisor code loaded on card.

– Replace frame supervisor card.

Is the problem resolved?

Yes **No**

008

– Call next level of support.

009

– Go to "MAP 0570: End of Call" on page 1-357.

010

Frame supervisor may be hung.

–

Type the following command from the control workstation:

```
hmcmds -Gv run_post frame#:0
```

– Check frame supervisor LED #4 (top yellow LED) or LED #6 (if twin-tail).

Is frame supervisor LED #4 or LED #6 (twin-tail) flashing?

Yes **No**

011

– Go to Step 053 on page 1-29.

012

– Replace frame supervisor card.

(Step **012** continues)

012 (continued)
– Check frame supervisor LED #4 (top yellow LED) and LED #6 (if twin-tail).
Is frame supervisor LED #4 or LED #6 (twin-tail) flashing?
Yes **No**

013

– Go to Step 053 on page 1-29.

014

– Go to Step 015.

015

Attention: Powering off processor node(s) or switch assemblies in a parallel environment may cause all jobs to flush from the queue and switch initialization to rerun.

Attention: If this frame contains processor node(s), they should be removed from active configuration before continuing. If processor node(s) 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.

Attention: If this frame contains switch assemblies, powering off switch assemblies will impact the entire switch network.

– Check with customer to see if you can power off all the processor node(s) and/or switch assemblies in this frame at this time.
Can you power off all processor node(s) and/or switch assemblies in this frame at this time?
Yes **No**

016

Cannot perform **complete** isolation at this time.
– Replace the frame supervisor card (refer to "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*).
– Check frame supervisor LED #4 (top yellow LED) or frame supervisor LED #6 (if a twin-tail frame supervisor card is being used).
Is frame supervisor LED #4 or LED #6 (twin-tail) flashing?
Yes **No**

017

– Go to Step 053 on page 1-29 to verify fix.

018

Requires further isolation.
– Schedule time with customer to complete service. You can resume service at Step 019 or “MAP 0100: Start of Service Call” on page 1-4.

019

(Step **019** continues)

019 (continued)
– Put main power switch at the front of the frame in the Off ('0') position.
Is there a cable connected at both PDU-BH-J7 and PDU-BH-J8?
Yes **No**

020

– Go to Step 022 on page 1-23.

021

– Use the following table to continue service:

Priority	Component	Action
1	PDU-BH-P7 (if present)	1. Disconnect cable from PDU bulkhead. 2. If frame supervisor LED #4 (top yellow LED) or LED #6 (if twin-tail) stops FLASHING, go to Step 022 on page 1-23; otherwise reconnect cable and continue at Priority 2.
2	PDU-BH-P8 (if present)	1. Disconnect cable from PDU bulkhead. 2. If frame supervisor LED #4 (top yellow LED) or LED #6 (if twin-tail) stops FLASHING, go to Step 022 on page 1-23; otherwise, reconnect cable and continue at Priority 3.
3	Cable Assembly (PDU Only) • PDU-FC-P406 • PDU-FC-P408	1. Check PDU-BH-J7 and PDU-BH-J8 (bulkhead) connections to PDU-FC-J406 and J408 (connector card). 2. If frame supervisor LED #4 (top yellow LED) or LED #6 (if twin-tail) stops FLASHING, go to Step 053 on page 1-29; otherwise, continue at Priority 4.
4	Connector card (PDU Only)	1. Replace card. 2. If frame supervisor LED #4 (top yellow LED) or LED #6 (if twin-tail) stops FLASHING, go to Step 053 on page 1-29; otherwise, continue at Priority 5.
5	Backplane card (PDU Only)	1. Replace card. 2. If frame supervisor LED #4 (top yellow LED) or LED #6 (if twin-tail) stops FLASHING, go to Step 053 on page 1-29; otherwise, continue at Priority 6.
6	SEPBU Chassis (SEPBU Only)	1. Replace chassis. 2. If frame supervisor LED #4 (top yellow LED) or LED #6 (if twin-tail) stops FLASHING, go to Step 053 on page 1-29; otherwise, continue at Priority 7.
7	All components replaced.	Call next level of support.

022

(Step **022** continues)

022 (continued)
Problem isolated to one supervisor harness: PDU-BH-J7 or PDU-BH-J8.
– Reconnect this supervisor harness at the PDU bulkhead.
– Following this supervisor harness, disconnect it from each switch assembly or processor node (each one individually), until the frame supervisor LED #4 (top yellow LED) or LED #6 (if twin-tail) stops FLASHING, or cable is disconnected from all processor node(s) and/or switch assemblies.

Does frame supervisor LED #4 (top yellow LED) or LED #6 (if twin-tail) stop FLASHING?
Yes **No**

023

– **Note which processor node or switch assembly was disconnected last**—this is the suspect unit.
– Reconnect this supervisor harness to any processor node or switch assembly other than the suspect unit.

Does frame supervisor LED #4 (top yellow LED) or LED #6 (if twin-tail) stop FLASHING?
Yes **No**

024

– Replace this supervisor harness: PDU-BH-P7 or PDU-BH-P8.
– Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does verification test pass?
Yes **No**

025

– Continue with Priority 3 in table of Step 021 on page 1-22.

026

– Go to Step 041 on page 1-26

027

Problem isolated to the suspect unit noted at the beginning of Step 023.
– Go to the second bullet of Step 028.

028

– **Note which processor node or switch assembly was disconnected last**—this is the suspect unit.
– Reconnect supervisor harness to its appropriate processor node(s) and/or switch assemblies, except for the suspect unit.
– Go to Step 035 on page 1-24 to continue service.

029

Communication problem with individual node or switch supervisor(s).

Attention: Powering off processor node(s) or switch assemblies in a parallel environment may cause all jobs to flush from the queue and switch initialization to rerun.

Attention: The processor node(s) or switch assemblies must be removed from active configuration before continuing. If processor node(s) or switch assemblies are off, continue; otherwise, ask customers to initiate

shutdown procedure and power-off unit(s) from the control workstation, or defer maintenance until all jobs are completed.

– Check that processor node or switch is not in use by customer before continuing.
– Put circuit breaker(s) at front of processor node or switch assembly in the Off (‘0’) position.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. You can repeat this test as necessary.
– Check slot address indicated by self-test against physical location. In a frame with processor nodes, the switch assembly is at slot address 17.

Does the supervisor card pass self-test, including the correct slot address?

Yes **No**

030

– If this is a 604, 604e, 332 MHz SMP,or POWER3 SMP node supervisor card, check that failure is not base code related (see "Base Code Verification" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*). Otherwise continue.
– Go to Step 033.

031

– Perform all tests of "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does verification test fail?

Yes **No**

032

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

033

Attention: This step may interrupt use of another processor node, or switch assembly.

Attention: Powering off processor node(s) or switch assemblies in a parallel environment may cause all jobs to flush from the queue and switch initialization to rerun.

– Perform "Supervisor Bus Swap Procedure" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, to determine if the problem is in supervisor harness or the unit (processor node or switch assembly).

Does the good unit pass?

Yes **No**

034

– Replace the supervisor harness connected to this processor node or switch assembly.
– Go to Step 039 on page 1-26.

035

Problem is in the unit (processor node or switch assembly).

Unit	Action
HiPS 2.0 switch assembly	Replace switch assembly
Thin node Wide node HiPS 3.0 assembly HiPS-LC8 assembly SPS assembly SPS-8 assembly	Replace supervisor card inside the processor node or switch assembly
604 high node 604e high node	Replace node supervisor card
332 MHz SMP or POWER3 SMP node	Replace node supervisor card. **Note:** Prior to replacing the node supervisor card, verify 48 V power cable(s) are plugged in the rear panel(s).

Refer to "Procedures for Thin Processor Nodes", "Procedures for Wide Processor Nodes", "Procedures for 604 or 604e High Processor Nodes", Procedures for 332 MHz SMP Processor Nodes, or "Procedures for Switch Assemblies" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to verify fix.

Does this test pass?

Yes **No**

036

Problem is in the unit (processor node or switch assembly).

Unit	Replace	Reference
Thin node Wide node HiPS 3.0 assembly HiPS-LC8 assembly	Supervisor bus cable inside the processor node or switch assembly	"FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*
SPS assembly SPS-8 assembly	Inner chassis cable	"Removing the Switch Inner Chassis Cable (SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
604 or 604e high node	High node supervisor adapter cable	"FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*
332 MHz SMP or POWER3 SMP node	Reseat the power supply modules	"FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*

– Replace the supervisor bus cable inside processor node or switch assembly (refer to "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*).

(Step **036** continues)

036 (continued)

– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to verify fix.

Does this test pass?

Yes **No**

037

– For a 604 or 604e high node, if this is the first time here, replace the blue ribbon I2C cable inside the high node supervisor card assembly, and go back to Step 036 on page 1-25 and perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to verify fix. If this is the second time here, replace the supervisor interface card within the high node supervisor card assembly, and go back to Step 036 on page 1-25 and perform "Node/Switch Supervisor Self-Test" to verify fix. If both parts have been replaced, call next level of support.

– For a 332 MHz SMP or POWER3 SMP node, if this is the first time here, replace the power mix board, and go back to Step 036 on page 1-25 and perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to verify fix. If this is the second time here, replace the tailgate card and cable, and go back to Step 036 on page 1-25 and perform "Node/Switch Supervisor Self-Test" to verify fix. If both parts have been replaced, call next level of support.

– Call next level of support.

038

– If this is a 604, 604e, 332 MHz SMP, or POWER3 SMP node, reinstall the old node supervisor card.

– Go to Step 039.

039

– Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does verification test pass?

Yes **No**

040

– Go to Step 036 on page 1-25.

041

Supervisor problem resolved.

– Make sure the main power switch at the front of the frame is in the On (‘1’) position.

– Put circuit breakers at front of processor node(s) and switch assemblies in the On (‘1’) position.

– If a new 604 or 604e high node supervisor card was installed, and the node supervisor code update was not already performed, then refer to "Updating the Node Supervisor Code" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Did you just service a switch assembly?

Yes **No**

042

– Go to “MAP 0570: End of Call” on page 1-357.

043

– Go to Step 101 on page 1-350, to continue verification.

044

Problem with multiple node and/or switch supervisors, but some communication on supervisor bus.
– Determine if indicated slot addresses include an entire set below:

Set A [2, 4, 6, 8, 10, 12, 14, 16, 17] Left side from back (includes switch or switches)

Set B [1, 3, 5, 7, 9, 11, 13, 15] Right side from back

Do indicated addresses all come from one set?
Yes **No**

045

Problem with various node and switch supervisors from both Set A and B.
– Go to Step 029 on page 1-23 and service each node and/or switch supervisor individually.

046

– Record which set (A or B) has the problem.
Attention: Powering off processor node(s) or switch assemblies in a parallel environment may cause all jobs to flush from the queue and switch initialization to rerun.

Attention: If this frame contains processor node(s), they should be removed from active configuration before continuing. If processor node(s) 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.

Attention: If this frame contains switch assemblies, powering off switch assemblies will impact the entire switch network.

– From the control workstation, power off all processor nodes (and/or switches) in this frame using command **hmcmds —G off** *xx***:***yy* (where xx = the designated frame number and yy = the designated nodes).
– Put the main power switch at front of the frame in the Off (‘0’) position.
– Swap supervisor harnesses A and B at Power Distribution Unit connectors PDU-BH-J7 and PDU-BH-J8. If only one harness is present, move it to the other connector.
– Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Check the system monitor log on the control workstation for addresses “not responding.”
Did failing nodes or switch move to other Set?
Yes **No**

047

Original Set still failing.
– Return supervisor harnesses to original connector locations:

- Set A -> PDU-BH-J7

(Step **047** continues)

047 (continued)
- Set B -> PDU-BH-J8

– Replace supervisor harness A or B, depending on which Set had original problem (reference Step 044 on page 1-27).
– Go to Step 053 on page 1-29 to verify fix.

048

– Return supervisor harnesses to original connector locations:

- Set A -> PDU-BH-J7
- Set B -> PDU-BH-J8

Does this frame have a SEPBU?
Yes **No**

049

Attention: High energy present. Do not touch 48 V dc busbars. Shorting will result in system outage.

– Open Power Distribution Unit dc panel to access the connector card. This can be done with frame power on.
– Swap cables at connector card PDU-FC-J406 and PDU-FC-J408.
– Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Check system monitor log from the control workstation.

Did the failing addresses move to other Set?
Yes **No**

050

– Return the cables to original connector locations:
  - PDU-BH-J7 to Connector card PDU-FC-J406
  - PDU-BH-J8 to Connector card PDU-FC-J408
– Replace cable PDU-FC-P406 (Set A) or PDU-FC-P408 (Set B), depending on which Set originally failed.
– Go to Step 053 on page 1-29.

051

– Replace connector card (refer to "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*).
– Go to Step 053 on page 1-29.

052

Problem isolated to SEPBU power chassis.

DANGER

High voltage present. Perform “Lockout/Tagout Procedure for PDU” on page 1-2 or “Lockout/Bagout Procedure for PDU” on page 1-3 to remove primary power to the frame.

(Step **052** continues)

052 (continued)
– Replace SEPBU power chassis (refer to "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*).
– Reconnect ac power to frame.
– Go to Step 053 to verify fix.

053

– Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Did this verification test pass?

Yes **No**

No:

054

– Go to “MAP 0120: Supervisor Bus Problem” on page 1-19, or “MAP 0110: Supervisor Subsystem” on page 1-10, as appropriate.

Yes:

055

Problem resolved.
– Put main power switch at front of frame in the On (‘1’) position.
– Go to “MAP 0570: End of Call” on page 1-357.

MAP 0130: Processor Node

The **Uniprocessor thin and wide processor nodes** have two LEDs on the front of each node. Uniprocessor wide processor nodes also have a duplicate pair of LEDs at the rear of the node. Their definitions are as follows:

Environment (Yellow)

Off	No environmental problems detected by node supervisor card.
On	Warning of environmental condition out of nominal range. Preventative Maintenance should be scheduled for this node.
Flashing	Serious environmental condition detected; power shut off.

Power (Green)

Off	No 48 V dc power available at processor node.
Flashing	Power available at processor node, but RS/6000 logic is Off.
On	Power available at processor node, and RS/6000 logic is On.

The **604 or 604e high node** supervisor card LED definitions are shown in the following table and in Figure 1-4 on page 1-31.

Table 1-3. 604 or 604e High Node LED Definitions

LED #	Color	Signifies
8		Not used
7		Not used
6		Not Used
5	Yellow	Environment status
4	Green	Key mode (Normal)
3	Green	Key mode (Secure)
2	Green	Key mode (Service)
1	Green	Node power status (same as wide node green LED)

Note: When LED #1 is Off and LED #5 is On, this indicates that base code is active.

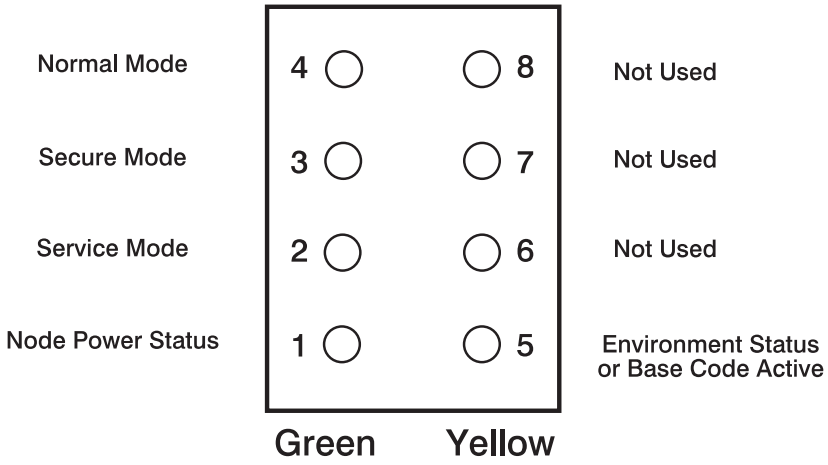

Figure 1-4. High Node Supervisor Card LEDs

Note: LEDs 6, 7, and 8 are unused.

The **332 MHz SMP node** supervisor card LED definitions are shown in the following table.

Table 1-4. 332 MHz SMP Node LED Definitions

LED #	Color	Signifies
8		Not used
7		Not used
6		Not used
5	Yellow	Environment status (On = Problem)
4	Green	I/O expansion power (On = Good)
3	Green	CPU assembly (On = Good)
2	Green	I/O expansion assembly installed (On = Yes)
1	Green	Node power status (On = OK)

Front Power LEDs	Thin Node Power Status	I/O Expansion Power Status
Yellow Off, Green Off	No 48 V dc power	No 48 V dc power
Yellow On, Green Blinking	48 V dc, but Power Off	48 V dc, but Power Off
Yellow On, Green On	48 V dc, and Power On	48 V dc, and Power On

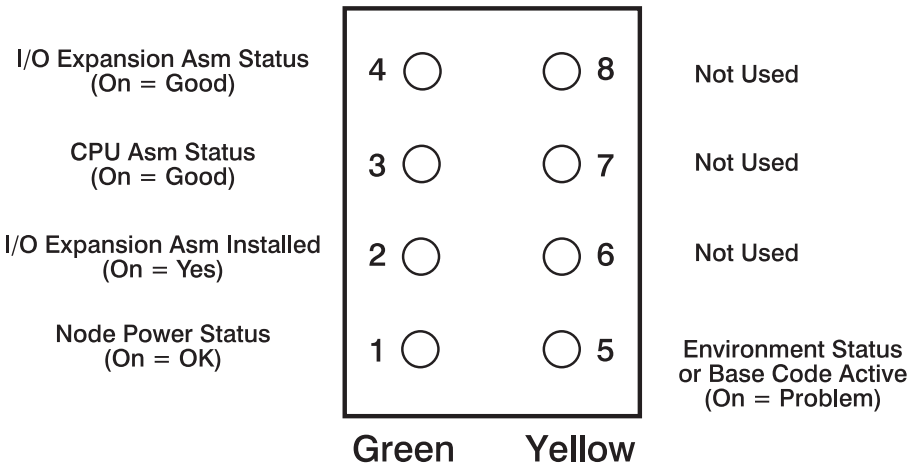

Figure 1-5. 332 MHz SMP Node Supervisor Card LEDs

Note: LEDs 6, 7, and 8 are unused.

The **POWER3 SMP node** supervisor card LED definitions are shown in the following table.

Table 1-5. POWER3 SMP Node LED Definitions

LED #	Color	Signifies
8		Not used
7		Not used
6		Not used
5	Yellow	Environment status (On = Problem)
4	Green	I/O expansion power (On = Good)
3	Green	CPU assembly (On = Good)
2	Green	I/O expansion assembly installed (On = Yes)
1	Green	Node power status (On = OK)

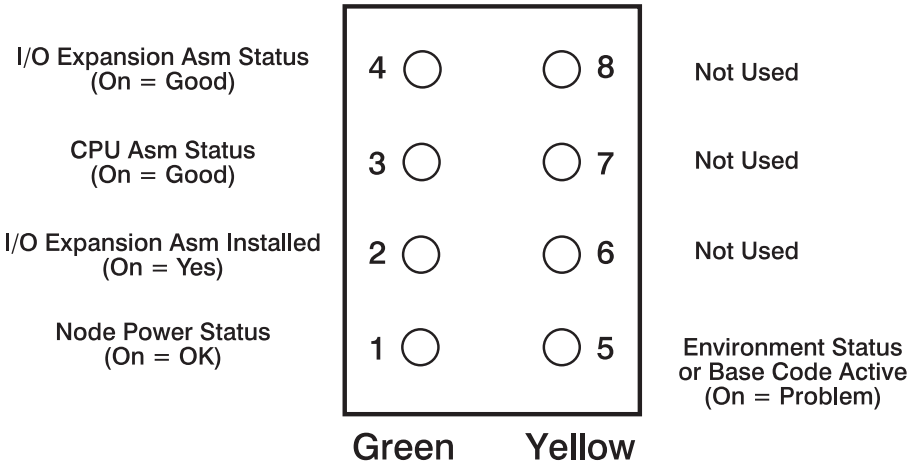

Figure 1-6. POWER3 SMP Node Supervisor Card LEDs

Note: LEDs 6, 7, and 8 are unused.

The RS/6000 SP processor nodes are functionally equivalent to various RS/6000 systems. Table 1-6 on page 1-33 shows the SP processor node and its equivalent RS/6000 model. This information can be used when referring to RS/6000 maintenance publications.

Table 1-6. SP Processor Nodes and Their Functionally Equivalent RS/6000 Models

RS/6000 SP Processor Node	**Equivalent RS/6000 Model**
Thin Nodes	
62 MHz Thin Node	7012 Model 370
66 MHz Thin Node	7012 Model 390
66 MHz Thin Node 2	7012 Model 394
120 MHz Thin Node	No equivalent RS/6000 model
160 MHz Thin Node	7012 Model 397
Wide Nodes	
66 MHz Wide Node	7013 Model 590
77 MHz Wide Node	7013 Model 591
135 MHz Wide Node	7013 Model 595
High Nodes	
604 High Node	7015 Model R40
604e High Node	7015 Model R50
Symmetric MultiProcessor (SMP) Nodes	
332 MHz SMP Thin Node	7025 Model H50
SP-Attached Server	Enterprise Server Models S70 and S7A
POWER3 SMP Thin Node	7043 Model 260

Thin Processor Node

Components

Each thin processor node consists of the following parts:

- RS/6000-based components:
  - I/O planar (except in 120 and 160 MHz thin nodes)
  - CPU card (except in 120 and 160 MHz thin nodes)
  - CPU planar (only in 120 and 160 MHz thin nodes)
  - Memory card(s)
  - SCSI riser card
  - SCSI terminator
  - Fixed disk drive cable(s)
  - Integrated Ethernet card
  - Micro Channel Ethernet card
  - Fixed disk drive(s)
  - Optional Micro Channel adapter cards.
- Unique RS/6000 SP components:
  - Node supervisor card/power supply
  - LED display card
  - Circuit breaker
  - Node control harness
  - Control cables
  - Power cables
  - Fans
  - Supervisor bus assembly.

Refer to Figure 1-7 on page 1-40, Figure 1-8 on page 1-41, and Figure 1-9 on page 1-42 for high-level views of a 66 MHz thin processor node, 66 MHz thin processor node 2, 120 MHz thin processor node, and 160 MHz thin processor node. Refer to "Location Diagrams of the RS/6000 SP Components" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for top views of the 66 MHz thin processor node, 66 MHz thin processor node 2, 120 MHz thin processor node, and 160 MHz thin processor node.

Feature Codes

2002	Two 66 MHz thin processor nodes
2004	Two 66 MHz thin node 2 processor nodes
2008	Two 120 MHz thin processor nodes
2022	Two 160 MHz thin processor nodes

Wide Processor Node

Components

Each wide processor node consists of the following parts:

- RS/6000-based components:
  - CPU planar
  - I/O planar
  - Memory card(s)
  - Micro Channel Ethernet card
  - Fixed disk drive(s)
  - Optional Micro Channel adapter cards.
- Unique RS/6000 SP components:
  - Wide Node supervisor card
  - Wide Node power card
  - LED display card
  - Circuit breaker
  - Node control harness
  - Control cables
  - Power cables
  - Fans
  - Fixed disk drive cable(s)

Refer to Figure 1-10 on page 1-43, for a high-level view of a wide processor node and to "Location Diagrams of the RS/6000 SP Components" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, for a top view of a wide processor node.

Types

2003	One 66 MHz wide processor node
2005	One 77 MHz wide processor node
2007	One 135 MHz wide processor nodes

604 or 604e High Processor Node

Components

Each high processor node consists of the following parts:

- RS/6000-based components:
  - System planar
  - I/O planar (x2)
  - Processor card(s)
  - Memory card(s)
  - Micro Channel Ethernet card
  - Fixed disk drive(s)
  - Optional Micro Channel adapter cards.
  - CPU card
  - Lateral planar 1 card
  - Lateral planar 2 card
  - IOD
  - Power supply
  - Cooling unit
  - Fans
- Unique RS/6000 SP components:
  - High Node supervisor card
  - High Node power card
  - LED display card
  - Circuit breaker
  - Node control harness
  - Control cables
  - Power cables
  - Fixed disk drive cable(s)

Refer to Figure 1-11 on page 1-44, for a high-level component view of a 604 or 604e high processor node and to "Location Diagrams of the RS/6000 SP Components" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, for a top view of a 604 or 604e high processor node. Refer to *7015 Models R30, R40, and R50 CPU Enclosure Installation and Service Guide* and *7015 Supplemental Information* for more detailed information on the 604 or 604e high node components.

Types

2006	One 112 MHz 604 high processor node
2009	One 200 MHz 604e high processor node

332 MHz SMP Processor Node

Components

Each 332 MHz SMP processor node consists of the following parts:

- RS/6000-based components:
  - System planar
  - I/O planar (x2)
  - Service processor card
  - Memory card(s)
  - Fixed disk drive(s)
  - Optional PCI channel cards
  - CPU cards
  - Power supplies
  - Fans
- Unique RS/6000 SP components:
  - 332 MHz SMP Node supervisor card
  - 332 MHz SMP Node power mix card
  - MX bus card
  - Wide node interface card
  - LED display card
  - Circuit breaker (power cables)
  - Node control harness
  - Control cables
  - Fixed disk drive cable(s)

Refer to Figure 1-12 on page 1-45, for a high-level component view of a 332 MHz SMP processor node and to "Location Diagrams of the RS/6000 SP Components" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, for a top view of a 332 MHz SMP processor node.

Types

2050	One 332 MHz SMP thin processor node
2051	One 332 MHz SMP wide processor node

SP-Attached Server

Components

Each SP-attached server consists of the following parts:

- See *RS/6000 Enterprise Servers S70 and S7A Installation and Service Guide*, SA38-0548, for a list of RS/6000 components.
- Unique RS/6000 SP components:
  - SAMI cable assembly
  - S1term cable assembly
  - Coax cable
  - 10-meter ground cable
  - RS/6000 SP system attachment adapter

Refer to *RS/6000 Enterprise Servers S70 and S7A Installation and Service Guide*, SA38-0548, for a high-level component views of a SP-attached server.

Types

The RS/6000 SP feature codes associated with the SP-attached server (F/C 9122 plus F/C 9123) refer to the system connections that attach the RS/6000 enterprise Server to your RS/6000 SP system. F/C 9122 and 9123 do not refer to hardware components. Because the Enterprise Servers are stand-alone devices with cable attachments to the SP system, these servers have some attributes that appear node-like to the SP system and other attributes that appear frame-like.

9122 Refers to the node-like attachment between the SP-attached server and the SP system

9123 Refers to the frame-like attachment between the SP-attached server and the SP system.

POWER3 SMP Thin and Wide Processor Node

Components

Each POWER3 SMP thin and wide processor node consists of the following parts:

- RS/6000-based components:
  - System planar
  - I/O planar (x2)
  - Memory card(s)
  - Fixed disk drive(s)
  - Optional PCI channel cards
  - CPU cards
  - Power supplies
  - Fans
- Unique RS/6000 SP components:
  - Node supervisor card
  - Node power mix card
  - MX bus card
  - Wide node interface card
  - LED display card
  - Circuit breaker (power cables)
  - Node control harness
  - Control cables
  - Fixed disk drive cable(s)

Refer to Figure 1-13 on page 1-46, for a high-level component view of a POWER3 SMP thin and wide processor node and to "Location Diagrams of the RS/6000 SP Components" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, for a top view of a POWER3 SMP thin and wide processor node.

Types

2052 One POWER3 SMP thin processor node

2053 One POWER3 SMP wide processor node

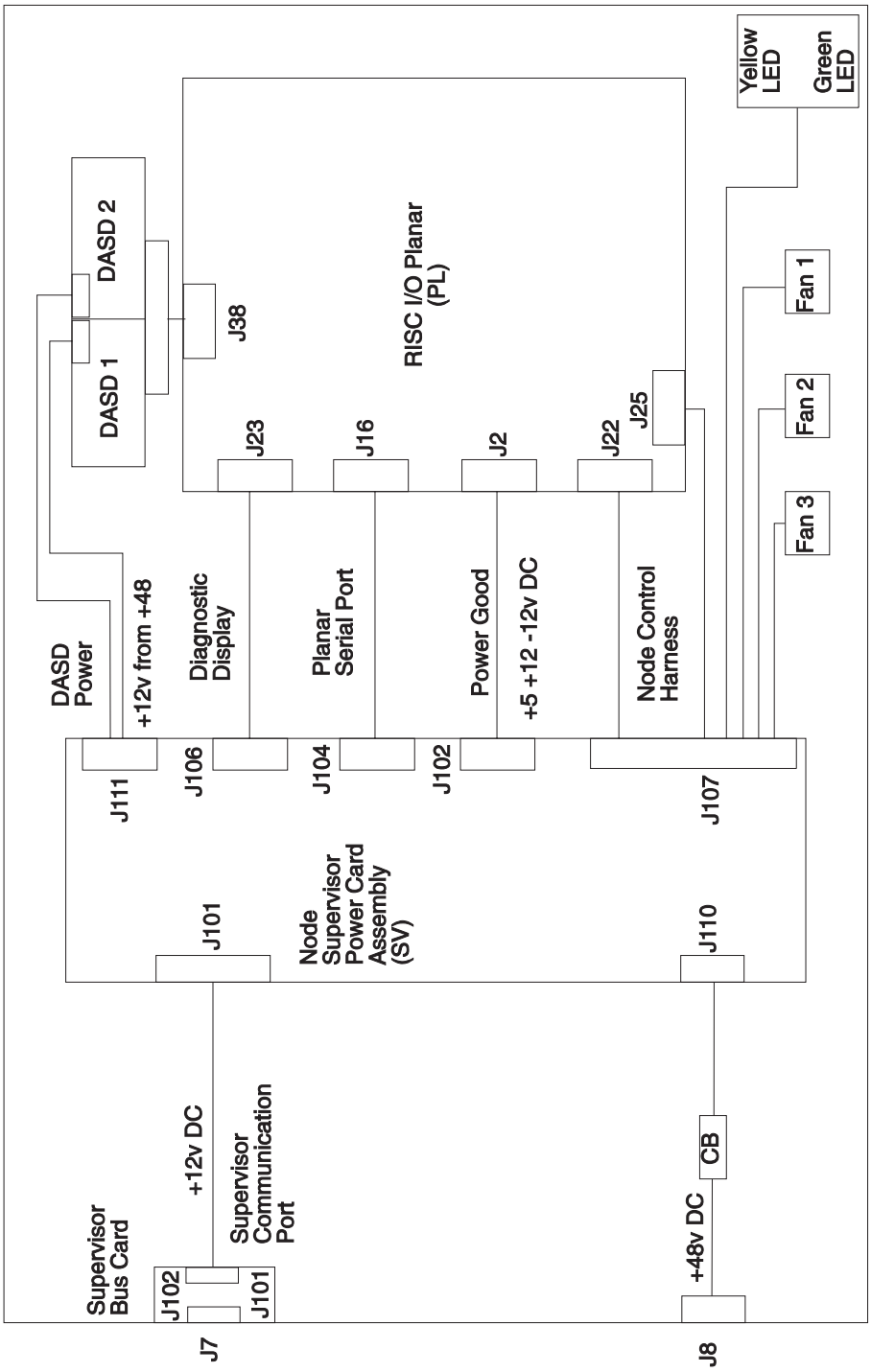

Figure 1-7. Thin Node High Level Diagram

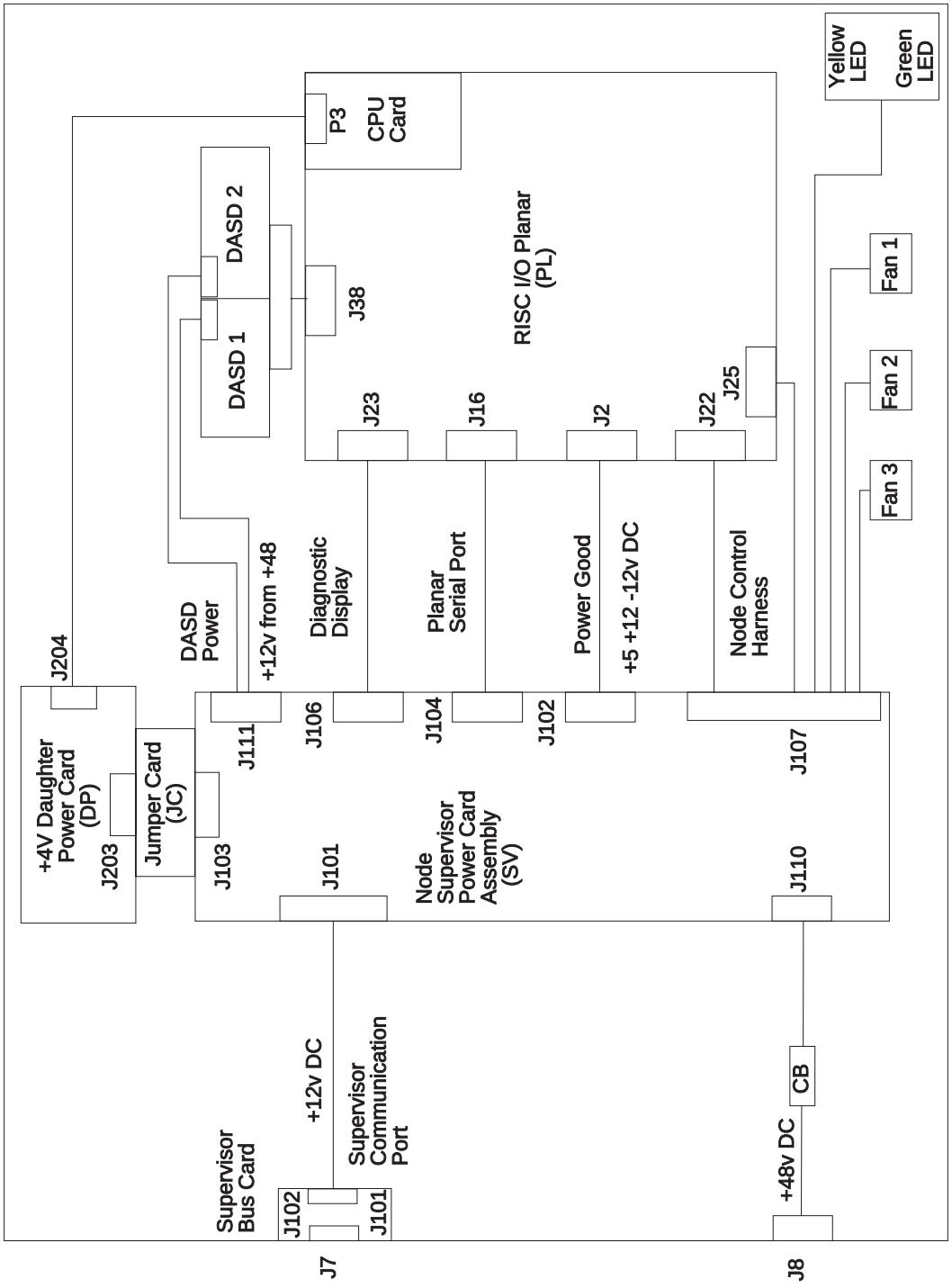

Figure 1-8. Thin Node 2 High Level Diagram

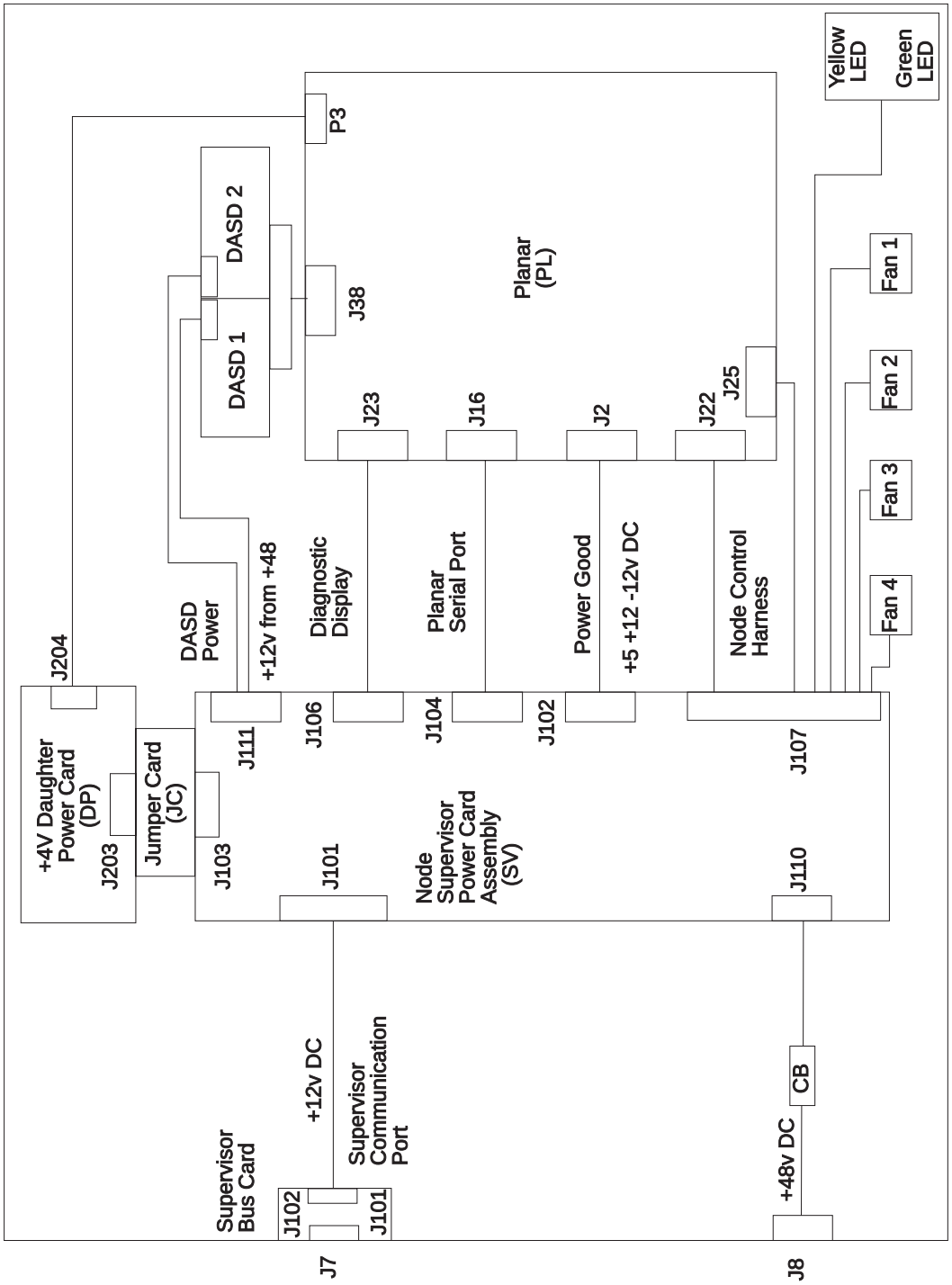

Figure 1-9. 120 and 160 MHz Thin Node High Level Diagram

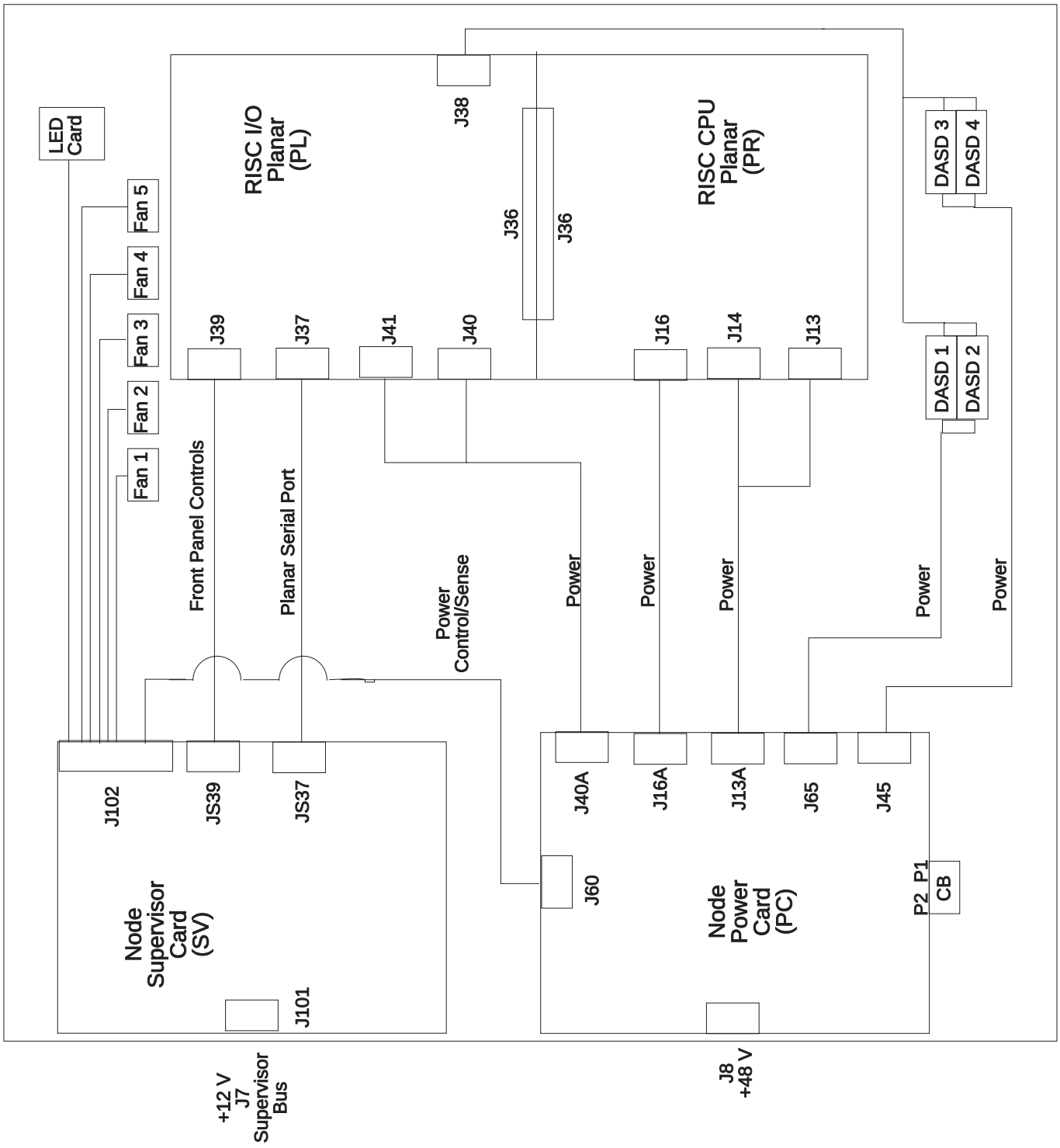

Figure 1-10. Wide Node High Level Diagram

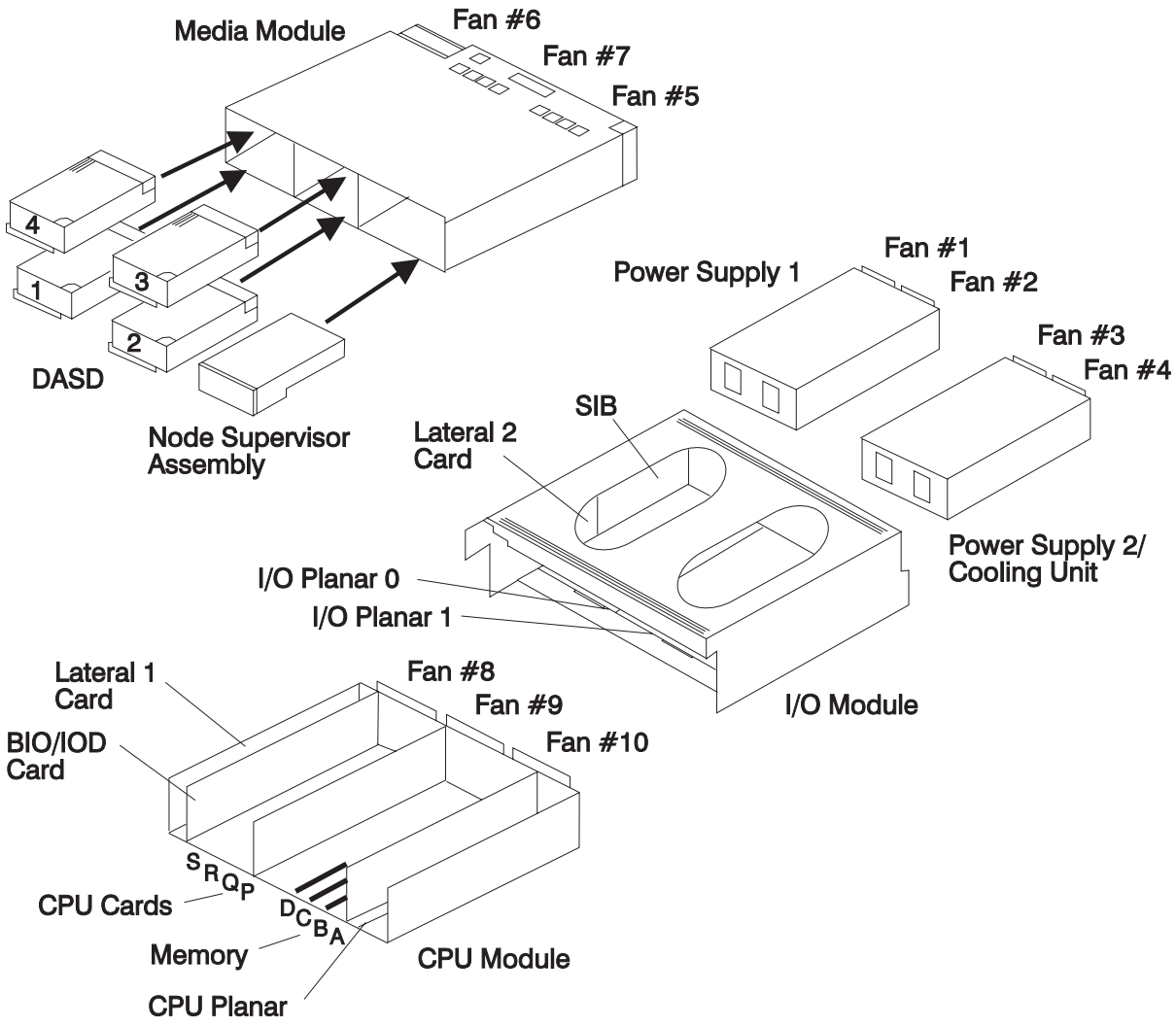

Figure 1-11. 604 or 604e High Node High Level Component Diagram

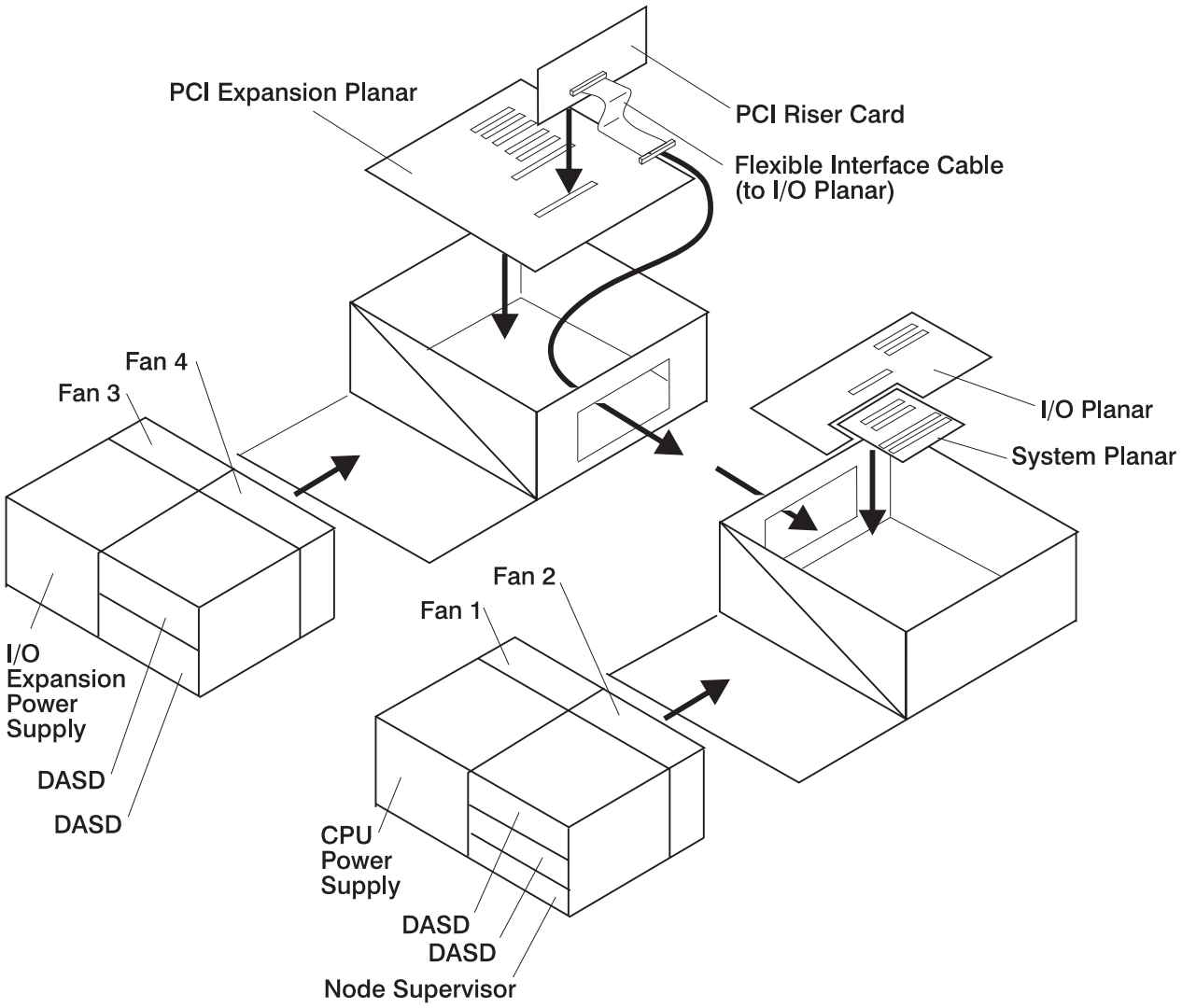

Figure 1-12. 332 MHz SMP Node High Level Component Diagram

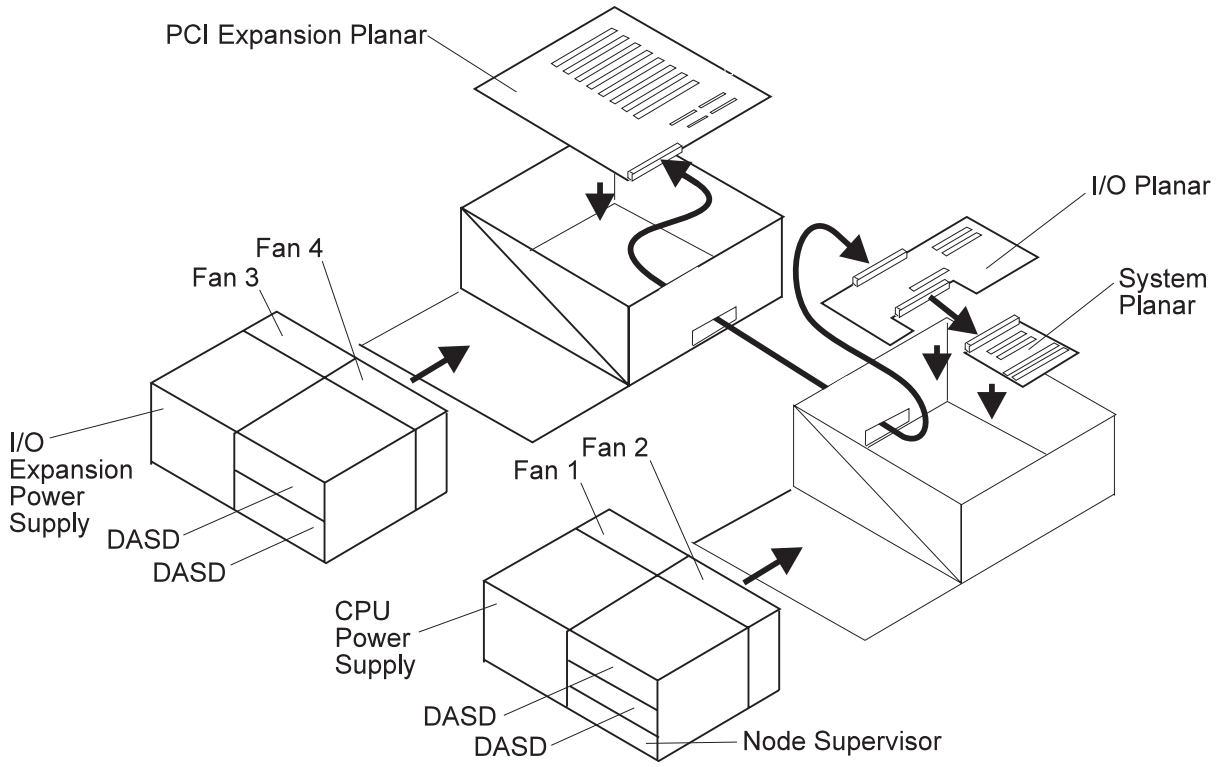

Figure 1-13. POWER3 SMP Thin and Wide Node High Level Component Diagram

001

Error reported in system monitor log or visual indication of a problem in processor node.
Read these warnings and then follow steps to ensure continuity of customer's jobs in the queue:

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 High Performance Switch (HiPS) feature or Scalable POWERparallel Switch (SPS) 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.

– Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.
– Refer to "Viewing Switch Partitions" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for locating and fencing/unfencing nodes within a switch partition.
– From the control workstation, check the hardware monitor log for indication of problem.
– The following table contains a prioritized list of conditions. Find the first condition that describes your problem, then perform the associated action:

Priority	Message or condition	Action
1	Environmental problems • Errpt: “Failure...” • Log: “Shutdown: Voltage...” • Log: “Shutdown: Fan...” • Log: “Shutdown: Temperature...” • Log: “Shutdown: Memory protect fault” • Errpt: “Warning...” • Log: “Warning:...” • (Environment) – **Uniprocessor (Thin/Wide Node)** - Yellow LED on or flashing – **SMP (Thin/Wide/High Node)** - LED #5 (yellow) on or flashing • “rc.powerfail” from TTY • Node's **errpt -a | pg** shows “Loss of Electric Power”	Go to the applicable MAP: • “MAP 0140: Thin Node/Thin Node 2 Environment” on page 1-50 • “MAP 0150: 120/160 MHz Thin Node Environment” on page 1-60 • “MAP 0210: Wide Processor Node Environment” on page 1-98 • “MAP 0250: 604 or 604e High Node Environment” on page 1-124 • “MAP 0290: 332 MHz SMP Node Environment” on page 1-160 • **SP-attached servers** (RS/6000 Machine Type 7017-S70 and S7A): Consult the *RS/6000 Enterprise Servers S70 and S7A Installation and Service Guide*. **Note:** Before disconnecting cables or performing service actions on an SP-attached server, perform "Decoupling and Coupling Code for SP-Attached Servers" in *RS/6000 SP: Maintenance Information, Volume 3*. • “MAP 0330: POWER3 SMP Thin and Wide Node Environment” on page 1-191 to perform the required service action.

Priority	Message or condition	Action
2	Power problem • **Uniprocessor (Thin/Wide Node)** – Green LED off or flashing • **SMP (Thin/Wide/High Node)** – LED #1 (green) off or flashing • (Power) Green LED off or flashing • Node has no power • All voltages at zero	Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to verify operation of LEDs. • If supervisor test fails, go to “MAP 0120: Supervisor Bus Problem” on page 1-19. • If test passes, go to the applicable MAP: – “MAP 0160: Thin Processor Node Power” on page 1-69 – “MAP 0220: Wide Processor Node Power” on page 1-105 – “MAP 0260: 604 or 604e High Node Power” on page 1-130 – “MAP 0300: 332 MHz SMP Node Power” on page 1-169 – **SP-attached servers** (RS/6000 Machine Type 7017-S70 and S7A): Consult the *RS/6000 Enterprise Servers S70 and S7A Installation and Service Guide*. **Note:** Before disconnecting cables or performing service actions on an SP-attached server, perform "Decoupling and Coupling Code for SP-Attached Servers" in *RS/6000 SP: Maintenance Information, Volume 3*. – “MAP 0340: POWER3 SMP Thin and Wide Node Power” on page 1-200 to perform the required service action.
3	Power problem — SP-attached servers (RS/6000 Machine Type 7017-S70 and S7A)	• Check the server to SP connection cables for correct plugging. Refer to "Installing SP-Attached Server Cables " in *RS/6000 SP: Maintenance Information, Volume 1*. Consult the *RS/6000 Enterprise Servers S70 and S7A Installation and Service Guide* to perform any required service action. **Note:** Before disconnecting cables or performing service actions on an SP-attached server, perform "Decoupling and Coupling Code for SP-Attached Servers" in *RS/6000 SP: Maintenance Information, Volume 3*. • Go to “MAP 0190: Processor Node Function” on page 1-87.
4	Processor problem • Front panel 3-digit LEDs non-blank (OK=blank)	Go to “MAP 0190: Processor Node Function” on page 1-87.

Priority	Message or condition	Action
5	Control problem • Node will not reset • Mode switch problem—problem setting NORMAL, SECURE, or SERVICE mode. • No response from TTY console only • 3-digit LEDs missing segments or remain blank	Go to the applicable MAP: • "MAP 0170: Thin Processor Node Control" on page 1-74 • "MAP 0230: Wide Processor Node Control" on page 1-110 • "MAP 0270: 604 or 604e High Node Control" on page 1-135 • "MAP 0310: 332 MHz SMP Node Control" on page 1-177 • **SP-attached servers** (RS/6000 Machine Type 7017-S70 and S7A): Check the server to SP connection cables for correct plugging. Refer to "Installing SP-Attached Server Cables " in *RS/6000 SP: Maintenance Information, Volume 1*. Consult the *RS/6000 Enterprise Servers S70 and S7A Installation and Service Guide* to perform any required service action. **Note:** Before disconnecting cables or performing service actions on an SP-attached server, perform "Decoupling and Coupling Code for SP-Attached Servers" in *RS/6000 SP: Maintenance Information, Volume 3*. • "MAP 0350: POWER3 SMP Thin and Wide Node Control" on page 1-208 to perform the required service action.

MAP 0140: Thin Node/Thin Node 2 Environment

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

001

System monitor reports “Warning”, “Shutdown”, or “Failure” message associated with processor node.

Does message indicate “Shutdown” or “Failure”?

Yes **No**

002

Message is a warning only.

– Refer to the node environment display frame.

Does this same message occur on more than one processor node?

Yes **No**

003

No immediate service required.

– Preventative maintenance can be done now by returning to Step 001. and treating the message as a “Shutdown” or “Failure” message, or service can be deferred until a later date.

004

– Notify next level of support.

005

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.

– Refer to the node environment, node detail, and node diagnostic display frames.

– Based on the text of the message, use the following table to continue service:

Condition	Action
“...P48 OK...”	Go to “MAP 0160: Thin Processor Node Power” on page 1-69.
“...shutdownP4...” “...shutdownP5...” “...shutdownP12...” “...shutdownN12...”	Go to Step 006 on page 1-51.
“...fanfail...”	Go to Step 017 on page 1-52.
“...shutdownTemp...”	Go to Step 021 on page 1-53.
“...memoryProtect...”	Go to Step 032 on page 1-55.

006

(Step **006** continues)

006 (continued)
One or more of the following conditions exist:

Voltage out of range: +4 V “shutdownP4”
Voltage out of range: +5 V “shutdownP5”
Voltage out of range: +12 V “shutdownP12”
Voltage out of range: –12 V “shutdownN12”
CPU card power problem: +4 V
Planar power problem: +5 V, +12 V, or –12 V

– Place processor node in service position.
– Check planar power cable connections at node supervisor card N00-NS-J102 and I/O planar N00-PL-J2. Also check condition of cable wires.
– If this is a problem involving a +4 V supply, check cable connections at node supervisor card N00-NS-J204 and CPU card N00-PR-P3. Also check condition of cable wires. Check daughter card connections from N00-NS-J103 to N00-DP-J203.

Do power cable(s) appear to be okay?

Yes **No**

No → **007**

– Fix power cable problem. Replace cable if necessary.
– Go to Step 018 on page 1-53

Yes → **008**

Is this a +5 V, +12 V, -12 V, or planar power problem?

Yes **No**

No → **009**

– Go to Step 037 on page 1-56

Yes → **010**

– Disconnect planar power cable N00-NS-P102 from node supervisor card inside processor node.
– Using a digital multimeter, measure resistance between the appropriate pins on cable N00-NS-P102. Pay attention to which leads to use when measuring resistance. Compare results with the values in this table.
– Do not reconnect the planar power cable at this time.

Voltage	Measure From (positive lead)	To GND (negative lead)	Acceptable Range
+5 V	Pin 1 (red) (see note)	Pin 2 (black)	5 - 35 Ohms
+12 V	Pin 3 (yellow) (see note)	Pin 2 (black)	500 - 9000 Ohms
–12 V	Pin 9 (purple) (see note)	Pin 2 (black)	500 - 1200 Ohms
Note: Pins 1, 3, and 9 are black in the 120 and 160 MHz thin processor node.			

Is the measured resistance in acceptable range?

Yes **No**

No → **011**

(Step **011** continues)

011 (continued)
– Remove cable at I/O planar N00-PL-J2, then check resistance on connector N00-PL-J2 using the same pins.
Is resistance the same as in Step 010 on page 1-51?
Yes **No**

012

– Replace planar power cable N00-NS-P102.
– Go to Step 018 on page 1-53

013

Problem in RS/6000 power distribution.
– Reconnect planar cable at N00-NS-P102 only.
– Go to "MAP 0180: Thin Processor Node dc Short/Open" on page 1-84.

014

Problem in node supervisor card.
– Replace node supervisor card.
Is there a +4 V dc problem?
Yes **No**

015

– Go to Step 017.

016

– Go to Step 037 on page 1-56.

017

– One or more of the following conditions exist:

- Warning Fan: "fanwarning1", "fanwarning2", "fanwarning3"
- Shutdown Fan: "fanfail1", "fanfail2", ..., "fanfail3"

– Place processor node in service position (see "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position).
– Use the following table to reseat or replace components:

Priority	Component	Action
1	Fan 1, 2, or 3	1. Check specified fan for blockage or loose cable connection. 2. Fix any obvious problem(s). If none are found, continue at Priority 2. 3. Continue at Step 018 on page 1-53.
2	Fan 1, 2, or 3	1. Replace fan as described in "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 2. Continue at Step 018 on page 1-53.
3	Node supervisor card	1. Replace card. 2. Continue at Step 018 on page 1-53.
4	Node supervisor control cable	1. Replace cable. Refer to Figure 1-14 on page 1-54, for cable connections. 2. Continue at Step 018 on page 1-53.
5	All replaced	Call next level of support.

018

Component replaced or reseated.
– Make sure that all cables and components are connected inside the processor node.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breaker at the front of processor node in the On (‘1’) position.
– Check the Environmental (yellow) LED for an ON or FLASHING condition.

Is the Environmental (yellow) LED ON or FLASHING?

Yes **No**

019

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

020

– Put circuit breaker at the front of the processor node in the Off (‘0’) position.
– Go to Step 017 on page 1-52 to service next highest priority component.

021

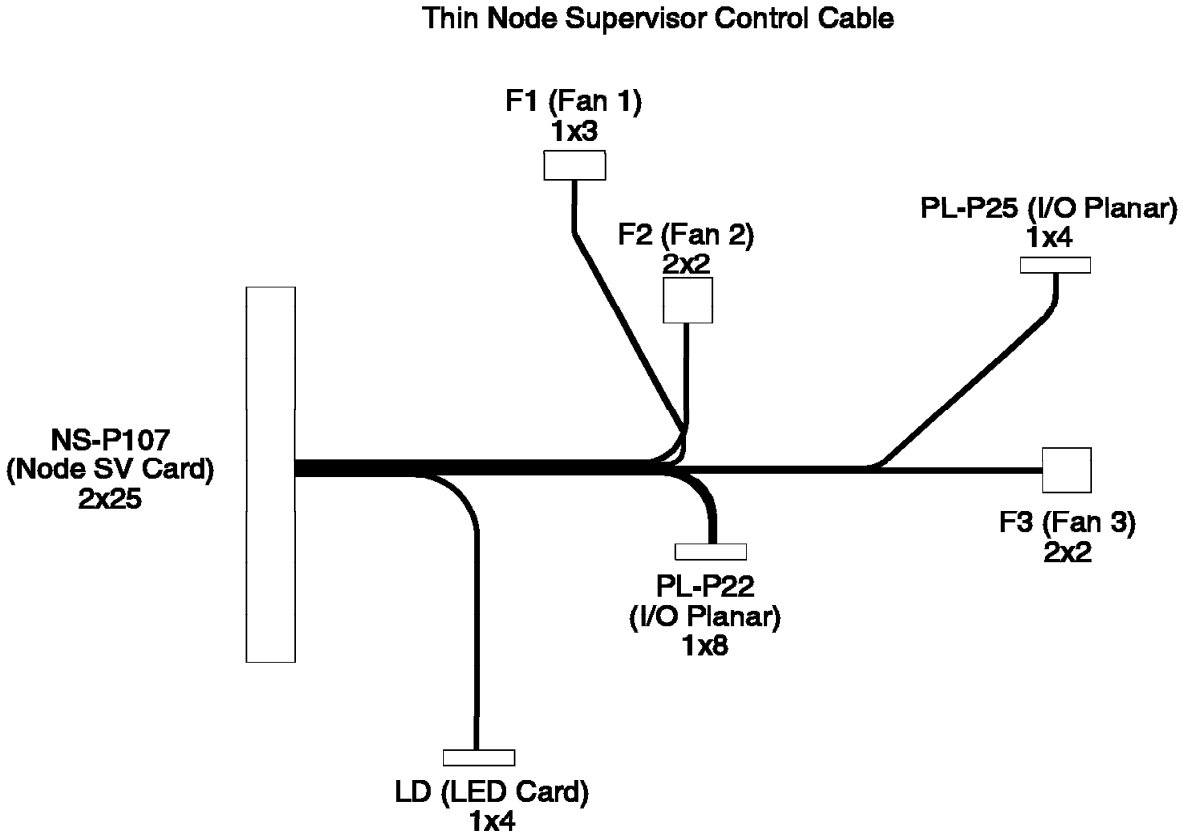

Figure 1-14. Thin Node Supervisor Control Cable

– Over temperature condition: “shutdownTemp”

  - Temperature is out of specified range; however, no serious electrical current or fan speed problems have been detected.

– Check for airflow blockage at air intakes and exhaust of the processor node and system frame. Also, check air temperature around the frame, looking for sources of abnormally high temperatures (above 40°C or 104°F).

Is there an obvious airflow blockage or abnormally high temperature source near air intakes?

Yes **No**

022

Problem in node supervisor card.
– Place processor node in service position.
– Replace node supervisor card.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does card pass self-test?

Yes **No**

023

– Go to Step 026 on page 1-55.

024

(Step **024** continues)

024 (continued)
Node supervisor card is okay.
– Put circuit breaker at the front of the processor node in the On ('1') position.
– Check Environmental (yellow) LED for ON or FLASHING condition.
Is Environmental (yellow) LED ON or FLASHING?
Yes **No**

025

Problem resolved.
– Remove processor node from service position.
– Go to "MAP 0570: End of Call" on page 1-357.

026

– Check cable connections to node supervisor card.
Are there any obvious problems such as a loose or broken cable?
Yes **No**

027

– Call next level of support.

028

– Fix obvious problem.
– Go to Step 024.

029

– Place processor node in service position.
– Power off the processor node, and remove blockage.
– Reconnect all cables at rear of the processor node.
– With Environmental (yellow) LED Off, power on the processor node.
Does the processor node IPL?
Yes **No**

030

Processor has problem with IPL.
– Go to "MAP 0130: Processor Node" on page 1-30.

031

Problem resolved.
– Remove processor node from service position.
– Go to "MAP 0570: End of Call" on page 1-357.

032

Memory protection error: "memoryProtect"

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

(Step **032** continues)

032 (continued)
Have memory parts been changed recently (since last successful IPL) in this processor node?
Yes **No**

033

– Problem may be one of the following:

- Base memory card
- CPU card
- I/O planar
- Node supervisor control cable.

– Replace parts, one at a time, until problem is corrected.
Are you able to correct the problem?
Yes **No**

034

– Call next level of support.

035

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

036

– Check memory card and SIMM part numbers in *Diagnostic Information for Micro Channel Bus Systems* (SA38-0532) and *Adapters, Devices and Cable Information* (SA38-0533) to ensure that they are compatible with the fastest Type 7012 machines.
– If necessary, call next level of support.

037

Problem with +4 V dc for CPU card power.
– Disconnect CPU power cable N00-DP-J204 at +4 V daughter power card.
– Using a digital multimeter, measure resistance between pin 1 and pin 5 on cable N00-DP-P204.

Voltage	Measure from (positive lead)	To GND (negative lead)	Acceptable Range
+4 V	Pin 1 (red)	Pin 5 (black)	4.0 - 100 Ohms

Is the measured resistance in acceptable range?
Yes **No**

038

– Remove CPU card from processor node, then repeat measurement from Step 037.
Is the measured resistance in acceptable range?
Yes **No**

039

(Step **039** continues)

039 (continued)
– Disconnect CPU power cable at CPU card N00-PR-P3, then measure resistance between pin 1 and pin 5 on CPU card N00-PR-P3.
Is the resistance the same as in Step 038 on page 1-56?
Yes **No**

040
– Replace CPU power cable N00-PR-P3.
– Go to Step 054 on page 1-58.

041
Problem on CPU card.
– If the resistance was above the acceptable range, check for component damage due to a short condition.
– Check for any obvious problems on CPU card (such as missing or loose components, damaged components, etc).
Is there an obvious problem on the CPU card?
Yes **No**

042
– Replace base CPU card, transferring all cache and memory SIMMs from the original CPU card to the new one.
– Go to Step 025 on page 1-55.

043
– Fix obvious problem. As required, replace parts suspected of causing problem.
– Go to Step 038 on page 1-56.

044
Problem may be related to I/O planar and/or memory card.
– Check for any obvious problems on CPU card connector to I/O planar (such as loose connections, poor contacts, etc).
Are there any obvious problems?
Yes **No**

045
– Remove memory card from processor node, then reinstall CPU card.
– Repeat measurement from Step 037 on page 1-56.
Is the measured resistance in acceptable range?
Yes **No**

046
Problem in either CPU card or I/O planar.
– Replace CPU card.
– Repeat measurement from Step 037 on page 1-56.
– If resistance if still out of range, replace the I/O planar.
– Go to Step 054 on page 1-58.

047

– Check memory SIMMs for obvious problems. Replace any suspect memory SIMM(s).
– Replace base memory card, transferring all good memory SIMMs from the original card to the new one.
– Go to Step 054.

048

– Fix obvious problem. As required, replace any damaged parts.
– Go to Step 054.

049

Probable problem with node supervisor or +4 V daughter card.
– Check for an obvious problem with jumper card between +4 V daughter card N00-DP-J203 and node supervisor card N00-NS-J103 (such as a loose connection).

Is there an obvious problem?

Yes **No**

050

– Replace +4 V daughter card.
– If suspected of a problem, replace the jumper card.
– Restore processor node, by performing steps in Step 054, then return to this step to continue.

Is the environmental (yellow) LED ON or FLASHING?

Yes **No**

051

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

052

– Replace node supervisor card.
– Go to Step 054.

053

– Fix obvious problem. As required, replace damaged components.
– Go to Step 054.

054

Component replaced or reseated.
– Make sure all cables and components are connected inside processor node.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breaker at the front of the processor node in the On (‘1’) position.
– Check the environmental (yellow) LED for an ON or FLASHING condition.
(Step **054** continues)

054 (continued)
Is the environmental (yellow) LED ON or FLASHING?
Yes **No**

055

Problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

056

Problem not resolved.
– Go to Step 037 on page 1-56.

MAP 0150: 120/160 MHz Thin Node Environment

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

001

System monitor reports “Warning”, “Shutdown”, or “Failure” message associated with processor node.

Does message indicate “Shutdown” or “Failure”?

Yes **No**

002

Message is a warning only.

– Refer to the node environment display frame.

Does this same message occur on more than one processor node?

Yes **No**

003

No immediate service required.

– Preventative maintenance can be done now by returning to Step 001 and treating the message as a “Shutdown” or “Failure” message, or service can be deferred until a later date.

004

– Notify next level of support.

005

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.

– Refer to the node environment, node detail, and node diagnostic display frames.

– Based on the text of the message, use the following table to continue service:

Condition	Action
“...P48 OK...”	Go to “MAP 0160: Thin Processor Node Power” on page 1-69.
“...shutdownP2_5d...” “...shutdownP4d...” “...shutdownP5...” “...shutdownP12...” “...shutdownN12...”	Go to Step 006 on page 1-61.
“...fanfail...”	Go to Step 017 on page 1-62.
“...shutdownTemp...”	Go to Step 021 on page 1-64.
“...memoryProtect...”	Go to Step 032 on page 1-65.

006

– One or more of the following conditions exist:

- Voltage out of range: +2.5 V “shutdownP2_5”
- Voltage out of range: +4 V “shutdownP4”
- Voltage out of range: +5 V “shutdownP5”
- Voltage out of range: +12 V “shutdownP12”
- Voltage out of range: –12 V “shutdownN12”
- CPU card power problem: +2.5 V
- Planar power problem: +5 V, +12 V, or –12 V

– Place processor node in service position.
– Check planar power cable connections at node supervisor card N00-NS-J102 and I/O planar N00-PL-J2. Also check condition of cable wires.
– If this is a problem involving a +4 V supply, check cable connections at node daughter card N00-DP-J204 and planar card N00-PL-P3. Also check condition of cable wires. Check daughter card connections from N00-NS-J103 to N00-DP-J203.

Do power cable(s) appear to be okay?

Yes **No**

No:

007

– Fix power cable problem. Replace cable if necessary.
– Go to Step 018 on page 1-63

Yes:

008

Is this a +5 V, +12 V, -12 V, or planar power problem?

Yes **No**

No:

009

– Go to Step 037 on page 1-66

Yes:

010

– Disconnect planar power cable N00-NS-P102 from node supervisor card inside processor node.
– Using a digital multimeter, measure resistance between the appropriate pins on cable N00-NS-P102. Pay attention to which leads to use when measuring resistance. Compare results with the values in this table.
– Do not reconnect the planar power cable at this time.

Voltage	Measure From (positive lead)	To GND (negative lead)	Acceptable Range
+5 V	Pin 1 (black)	Pin 2 (black)	5 - 35 Ohms
+12 V	Pin 3 (black)	Pin 2 (black)	500 - 9000 Ohms
–12 V	Pin 9 (black)	Pin 2 (black)	500 - 1200 Ohms

(Step **010** continues)

010 (continued)
Is the measured resistance in acceptable range?
Yes **No**

011

– Remove cable at I/O planar N00-PL-J2, then check resistance on connector N00-PL-J2 using the same pins.
Is resistance the same as in Step 010 on page 1-61?
Yes **No**

012

– Replace planar power cable N00-NS-P102.
– Go to Step 018 on page 1-63

013

Problem in RS/6000 power distribution.
– Reconnect planar cable at N00-NS-P102 only.
– Go to "MAP 0180: Thin Processor Node dc Short/Open" on page 1-84.

014

Problem in node supervisor card.
– Replace node supervisor card.
Is there a +4 V dc problem?
Yes **No**

015

– Go to Step 017.

016

– Go to Step 037 on page 1-66.

017

– One or more of the following conditions exist:

- Warning Fan: "fanwarning1", "fanwarning2", "fanwarning3", "fanwarning4"
- Shutdown Fan: "fanfail1", "fanfail2", "fanfail3", "fanfail4"

– Place processor node in service position.
– Use the following table to reseat or replace components:

Priority	Component	Action
1	Fan 1, 2, 3, or 4	1. Check specified fan for blockage or loose cable connection. 2. Fix any obvious problem(s). If none are found, continue at Priority 2. 3. Continue at Step 018 on page 1-63.
2	Fan 1, 2, 3, or 4	1. Replace fan as described in "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 2. Continue at Step 018 on page 1-63.
3	Node supervisor card	1. Replace card. 2. Continue at Step 018 on page 1-63.
4	Node supervisor control cable	1. Replace cable. Refer to Figure 1-15 on page 1-63, for cable connections. 2. Continue at Step 018 on page 1-63.
5	All replaced	Call next level of support.

P2SC Thin Node Supervisor Control Cable

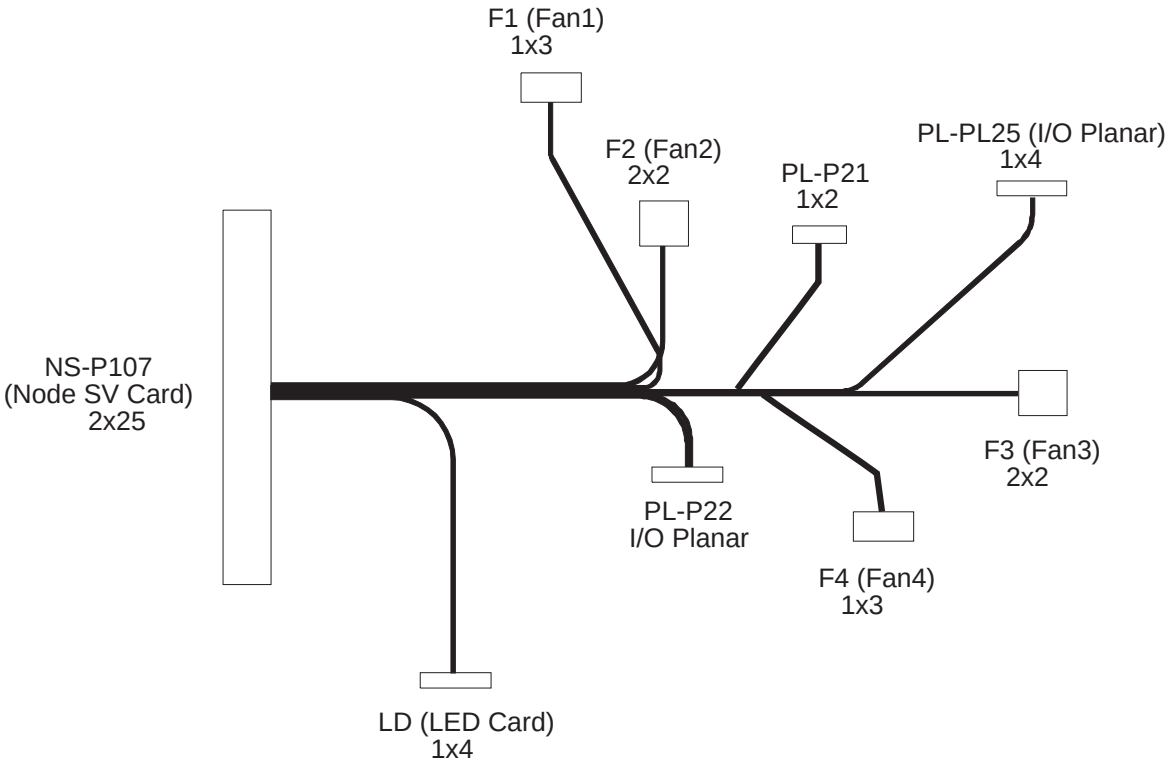

Figure 1-15. 120 or 160 MHz Thin Node Supervisor Control Cable

018

(Step **018** continues)

018 (continued)
Component replaced or reseated.
– Make sure that all cables and components are connected inside the processor node.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breaker at the front of processor node in the On (‘1’) position.
– Check the Environmental (yellow) LED for an ON or FLASHING condition.

Is the Environmental (yellow) LED ON or FLASHING?

Yes **No**

019

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

020

– Put circuit breaker at the front of the processor node in the Off (‘0’) position.
– Go to Step 017 on page 1-62 to service the next highest priority component.

021

Over temperature condition: “shutdownTemp”

Temperature is out of specified range; however, no serious electrical current or fan speed problems have been detected.

– Check for airflow blockage at air intakes and exhaust of the processor node and system frame. Also, check air temperature around the frame, looking for sources of abnormally high temperatures (above 40°C or 104°F).

Is there an obvious airflow blockage or abnormally high temperature source near air intakes?

Yes **No**

022

Problem in node supervisor card.
– Place processor node in service position.
– Replace node supervisor card.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does card pass self-test?

Yes **No**

023

– Go to Step 026 on page 1-65.

024

Node supervisor card is okay.
– Put circuit breaker at the front of the processor node in the On (‘1’) position.
– Check Environmental (yellow) LED for ON or FLASHING condition.
(Step **024** continues)

024 (continued)
Is Environmental (yellow) LED ON or FLASHING?
Yes **No**

025

Problem resolved.
– Remove processor node from service position.
– Go to "MAP 0570: End of Call" on page 1-357.

026

– Check cable connections to node supervisor card.
Are there any obvious problems such as a loose or broken cable?
Yes **No**

027

– Call next level of support.

028

– Fix obvious problem.
– Go to Step 024 on page 1-64.

029

– Place processor node in service position.
– Power off the processor node, and remove blockage.
– Reconnect all cables at rear of the processor node.
– With Environmental (yellow) LED Off, power on the processor node.
Does the processor node IPL?
Yes **No**

030

Processor has problem with IPL.
– Go to "MAP 0130: Processor Node" on page 1-30.

031

Problem resolved.
– Remove processor node from service position.
– Go to "MAP 0570: End of Call" on page 1-357.

032

Memory protection error: "memoryProtect"

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

Have memory parts been changed recently (since last successful IPL) in this processor node?
Yes **No**

033

(Step **033** continues)

033 (continued)
Problem may be one of the following:

Base memory card
I/O planar
Node supervisor control cable.

– Replace parts, one at a time, until problem is corrected.
Are you able to correct the problem?
Yes **No**

034

– Call next level of support.

035

Problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

036

– Check memory card and SIMM part numbers in *Diagnostic Information for Micro Channel Bus Systems* (SA38-0532) and *Adapters, Devices and Cable Information* (SA38-0533) to ensure that they are compatible with the fastest Type 7012 machines.
– If necessary, call next level of support.

037

Problem with dc voltage for I/O planar.
– Disconnect power cable N00-DP-J204 at daughter power card.
– Using a digital multimeter, measure resistance between pin 1 and pin 5 on cable N00-DP-P204.

Voltage	Measure from (positive lead)	To GND (negative lead)	Acceptable Range
+2.5 V	Pin 1 (black)	Pin 5 (black)	4.0 - 100 Ohms
+4 V	Pin 1 (red)	Pin 5 (black)	4.0 - 100 Ohms

Is the measured resistance in acceptable range?
Yes **No**

038

– Remove the memory card(s) from processor node, then repeat measurement from Step 037.
Is the measured resistance in acceptable range?
Yes **No**

039

– Disconnect power cable at I/O planar N00-PL-P3, then measure resistance between pin 1 and pin 5 on N00-PL-P3.
(Step **039** continues)

039 (continued)
Is the resistance the same as in Step 038 on page 1-66?
Yes **No**

040

– Replace power cable N00-PR-P3.
– Go to Step 052 on page 1-68.

041

Problem on I/O planar.
– Replace I/O planar, transferring all memory cards from the original I/O planar to the new one.
– Go to Step 025 on page 1-65.

042

Problem with memory card(s).
– Install a memory card in processor node.
– Repeat measurement from Step 037 on page 1-66.
Is the measured resistance in acceptable range?
Yes **No**

043

Problem in either memory card.
– Check memory SIMMs for obvious problems. Replace any suspect memory SIMM(s).
– Replace base memory card, transferring all good memory SIMMs from the original card to the new one.
– Repeat measurement from Step 037 on page 1-66.
Is the measured resistance in acceptable range?
Yes **No**

044

– Replace I/O planar.
– Go to Step 052 on page 1-68.

045

– Go to Step 052 on page 1-68.

046

– Install second memory card (if applicable).
– Go to Step 052 on page 1-68.

047

Possible problem with node supervisor or daughter card.
– Check for an obvious problem with jumper card between daughter card N00-DP-J203 and node supervisor card N00-NS-J103 (such as a loose connection).
(Step **047** continues)

047 (continued)
Is there an obvious problem?
Yes **No**

048

– Replace daughter card.
– If suspected of a problem, replace the jumper card.
– Restore processor node, by performing steps in Step 052, then return to this step to continue.
Is the environmental (yellow) LED ON or FLASHING?
Yes **No**

049

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

050

– Replace node supervisor card.
– Go to Step 052.

051

– Fix obvious problem. As required, replace damaged components.
– Go to Step 052.

052

Component replaced or reseated.
– Make sure all cables and components are connected inside processor node.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breaker at the front of the processor node in the On (‘1’) position.
– Check the environmental (yellow) LED for an ON or FLASHING condition.
Is the environmental (yellow) LED ON or FLASHING?
Yes **No**

053

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

054

Problem not resolved.
– Go to Step 037 on page 1-66.

MAP 0160: Thin Processor Node Power

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

001

– From the system monitor, check the Power (green) LED for this processor node.
The definition of the Power (green) LED is as follows:

Power (Green)

Off	No 48 V dc power available at processor node.
Flashing	Power available at processor node, but RS/6000 logic is Off.
On	Power available at processor node, and RS/6000 logic is On.

Is Power (green) LED Off?
Yes **No**

002

Processor node getting 48 V dc power.
Is Power (green) LED flashing?
Yes **No**

003

Power (green) LED is On, indicating no problem with power supply.
– Verify that you have the proper processor node, then go to “MAP 0130: Processor Node” on page 1-30.
– If this is the proper processor node, call the next level of support.

004

Processor node is getting power.
– Power on RS/6000 logic from the virtual front panel on the control workstation.
Does Power (green) LED light and stay lit?
Yes **No**

005

Node not responding to the command.
– Go to “MAP 0110: Supervisor Subsystem” on page 1-10.

006

RS/6000 logic getting power.
Does processor node IPL successfully?
Yes **No**

007

Processor node has problem with IPL.
– Go to “MAP 0130: Processor Node” on page 1-30.

008

No problem detected.
– Go to "MAP 0570: End of Call" on page 1-357.

009

Possible problem with node power harness or node supervisor card.
– Go to Step 010

010

– Check circuit breaker at front of processor node. Put circuit breaker in the On ('1') position if it is not already.

Does the circuit breaker stay in the On ('1') position?

Yes **No**

011

– Place processor node in service position.
– Check node power harness inside processor node for any obvious problems which might cause a short.

Is there an obvious problem which might cause a short?

Yes **No**

012

– Replace the node supervisor card.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Reinstall processor node in the frame and connect power and supervisor cables at rear of processor node.
– Go to Step 010.

013

– Fix obvious problem(s). If necessary, replace node power harness, N00-NS-J110.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Reinstall processor node in the frame and connect power and supervisor cables at rear of processor node.
– Go to Step 010.

014

Possible problem with 48 V dc harness.
– Go to Step 015

015

– From control workstation or processor node, check Power (green) LED for this node.

(Step **015** continues)

015 (continued)

Is Power (green) LED Off?

Yes **No**

016

Processor node problem resolved.

– Go to "MAP 0570: End of Call" on page 1-357.

017

– Check processor node(s) on any other dc power harness for any that are powered on. Ensure that the other processor has its circuit breaker in the On ('1') position.
– Check the Power (green) LED for an On or Flashing condition.
– Processor nodes receive 48-volt power through one of four power harnesses. The sets of processor nodes are as follows:

```
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
```

Is the Power (green) LED on other processor(s) nodes On or Flashing?

Yes **No**

018

– Go to "MAP 0370: Main Power" on page 1-222.

019

– Check all other processor nodes on the same dc power harness as the failing processor node to check for the same symptom - circuit breaker on but Power (green) LED not lit.

Is this the only processor node showing this symptom?

Yes **No**

020

Problem with 48 V dc power distribution.

– Go to "MAP 0480: Open in 48 V dc Distribution" on page 1-283

021

– Check cable connection at processor node tailgate N00-BH-J8 for a good connection.

Is there a good connection?

Yes **No**

022

– Fix cable connection problem.
– Go to Step 015 on page 1-70.

023

– Place processor node in service position.
– Put circuit breaker at front of processor node in the On ('1') position
– Unplug 48 V dc harness N00-NS-P110 from node supervisor card.

(Step **023** continues)

023 (continued)

– Using a digital multimeter, check for continuity from node tailgate N00-BH-J8 pin 1 to plug N00-NS-P110 pin 1. Check for continuity from node tailgate N00-BH-J8 pin 5 to plug N00-NS-J110 pin 2.

Is there continuity?

Yes **No**

024

– Check continuity between two tabs of processor node circuit breaker.

Is there continuity?

Yes **No**

025

Problem with circuit breaker.

– Replace processor node circuit breaker.
– Replug N00-NS-P110 at node supervisor card.
– Go to Step 031 to verify fix.

026

– Go to Step 029 to replace node power harness.

027

Possible problem with node supervisor card or node power harness inside processor node.

– Go to Step 028

028

– Using a digital multimeter, check for continuity between tailgate N00-NS-J110 pin 1 and pin 2.

Does the multimeter indicate an open condition?

Yes **No**

029

Problem with node power harness inside processor node.

– Replace the node power harness N00-NS-P110 inside this processor node.
– Reinstall processor node in frame.
– Go to Step 031 to verify fix.

030

– Replace the node supervisor card, taking care to replug all cables, including node power harness N00-NS-P110.
– Go to Step 031 to verify fix.

031

– Remove processor node from service position.
– Reconnect all cables at rear of processor node.
– Put circuit breaker at front of processor node in the On (‘1’) position.
– Check Power (green) LED for an OFF position.

(Step **031** continues)

031 (continued)
Is the Power (green) LED OFF?
Yes **No**

032

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

033

Problem with the 48 V dc power distribution to this processor node.
– Go to “MAP 0480: Open in 48 V dc Distribution” on page 1-283.

MAP 0170: Thin Processor Node Control

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 High Performance Switch (HiPS) feature or Scalable POWERparallel Switch (SPS) 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.

Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

Refer to "Viewing Switch Partitions" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for locating and fencing/unfencing nodes within a switch partition.

001

Processor node problem detected by customer or CE.
– Use the following table to continue service:

Condition	Action
• 3-digit LEDs are displayed but missing segments or remain blank	Go to Step 036 on page 1-81.
• Node will not reset • Mode switch problem—problem setting NORMAL, SECURE, or SERVICE mode.	Go to Step 002.
• No response from TTY console	Go to Step 026 on page 1-78.
• Yellow or green LEDs on node will not light.	Go to Step 042 on page 1-82.

002

Node will not reset or mode switch problem.
– Check with customer to make sure this processor node is not in the current active configuration. If processor node is *not* operational and actively working at this time, continue service. If it *is* operational and actively working, schedule a time convenient for the customer.
– From the control workstation, open the node front panel display.
– Make note of the mode switch position for this processor node—NORMAL, SECURE, or SERVICE.
– Set mode switch to something other than that recorded above.
– If not already there, set the mode switch to SERVICE.

Note: Do NOT recycle node power until reset fault is verified

.

Does the mode switch fail to toggle?
Yes **No**

003

Problem not related to mode switch.
(Step **003** continues)

003 (continued)
Was mode originally in SERVICE position as noted in previous step?
Yes **No**

004

Customer may have tried to reset processor node in SECURE mode. Reset will only take effect in NORMAL or SERVICE modes.
– From the control workstation, reset this processor node.
Does processor node reset?
Yes **No**

005

Problem with reset.
– Go to Step 012 on page 1-76.

006

No problem found.
– Inform customer that the processor node will not reset if the mode switch is in the SECURE position.
– Go to "MAP 0570: End of Call" on page 1-357.

007

– From the control workstation, issue reset for this processor node.
Does processor node reset?
Yes **No**

008

Problem with reset.
– Go to Step 012 on page 1-76.

009

Intermittent problem may be occurring.
– Please record following:

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

– Check logs to see if this fault has been previously recorded.
Is this a recurring fault?
Yes **No**

010

This is not a recurring fault.
– Go to "MAP 0570: End of Call" on page 1-357.

011

Reoccurrence of intermittent fault has been detected.
(Step **011** continues)

011 (continued)
– Treat this fault as a solid failure.
– Go to Step 024 on page 1-77.

012

– From the control workstation node front panel display:

- Power-off processor node.
- Power-on processor node.
- Check 3-digit LEDs for LED sequence indicating IPL.

Do the 3-digit LEDs change?
Yes **No**

013

Node supervisor card not responding to commands.
– Go to "MAP 0110: Supervisor Subsystem" on page 1-10.

014

Processor node is IPLing.
Do 3-digit LEDs eventually indicate completion of IPL sequence (i.e. blank or "uuu")?
Yes **No**

015

Processor node has problem IPLing.
Do 3-digit LEDs stop at constant 200?
Yes **No**

016

– Go to Step 008 on page 1-88 to continue service.

017

Problem with SECURE signal.
– Go to Step 024 on page 1-77 to continue service.

018

– From node front panel display, click on "TTY" button. to open a TTY console.
– From the TTY console:

- Select "Advanced Diagnostic Routines"
- Select "System Verification"
- Select "Base System".

– Follow directions for the "Key Mode Switch Test", setting the mode switch from the processor node's front panel on the control workstation.
(Step **018** continues)

018 (continued)
Does this test indicate a failure?
Yes **No**

019

– From the control workstation, reset this processor node.
Does processor node reset?
Yes **No**

020

Problem with reset.
– Go to Step 024 to continue service with the next highest priority component.

021

Node reset and mode switches functioning properly.
Was this a solid problem? (If the problem was cleared by power-on only, answer No.)
Yes **No**

022

This is an intermittent problem.
– Please record following tracking information:

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

– Go to “MAP 0570: End of Call” on page 1-357.

023

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

024

Problem with reset or mode switch function.
– From the control workstation power off processor node.
– Place processor node in service position.
– Remove processor node from frame, then remove top cover of processor node.
– Refer to the following table for priority of repair or replacement of components.

Priority	Component	Action
1	Cable N00-NS-P107 to N00-PL-P22	1. Check for proper seating and continuity. See Table 1-7 on page 1-78. If no problem is found, continue at Priority 2. 2. Repair or replace cable assembly as required. 3. Go to Step 025 on page 1-78 to verify fix.
2	Node Supervisor Card	1. Replace card. 2. Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 3. Go to Step 025 on page 1-78 to verify fix.
3	Planar Board	1. Replace board. 2. Go to Step 025 on page 1-78 to verify fix.
4	All replaced	Call next level of support.

Node supervisor card N00-NS-J107 to I/O planar N00-PL-J22 cable check points:

Table 1-7. Cable Continuity Check Points

Signal	From	To
Reset	N00-NS-P107 pin A12	N00-PL-P22 pin 7
Service	N00-NS-P107 pin A13	N00-PL-P22 pin 3
Secure	N00-NS-P107 pin B12	N00-PL-P22 pin 2

025

Component has been repaired or replaced.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– If not already done, verify that cables and components are seated properly.
– If not already done, install processor node top cover, then reinstall processor node in frame.
– Put the circuit breaker at the front of the processor node in the On (‘1’) position.
– Go to Step 018 on page 1-76 to continue service.

026

No response from TTY console for a processor node.
– Make sure processor node was IPLed in NORMAL mode.
– From system file server, telnet into this processor node:

telnet *nodename*
– Log in as “root”.
– Check to make sure that the TTY port on the processor node is correctly defined per customer requirements.

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

   smit console

   Use the menu options to check and/or 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.

(Step **026** continues)

026 (continued)

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

   smit tty

   Use the menu options to check and/or reconfigure the “s1” TTY port as required. The proper TTY parameters are listed in *IBM RS/6000 SP: Administration Guide*.

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

Yes **No**

No → **027**

TTY not responding due to customer configuration.
– Customer must configure these parameters.
– Go to “MAP 0570: End of Call” on page 1-357.

Yes → **028**

Problem due to hardware.
– Close console TTY window (if already open)
– Log into the node over the Ethernet:

telnet *nodename*

– Enter the following command:

chcons /dev/tty1

– Use **diag** command to run regular (not advanced) diagnostics on “TTY0”.

Do the diagnostics pass (no problem found)?

Yes **No**

No → **029**

– Replace I/O planar board.
– Go to Step 031 on page 1-80.

Yes → **030**

– Log into the node over the Ethernet:

telnet *nodename*

– Enter the following command:

chcons /dev/tty0

– From the control workstation, make sure the node front panel display is open.
– Close TTY console at this time.
– Have the customer remove the processor node from the active configuration, and power off the processor node.
– Place processor node in service position.
– Refer to the following table for priority of replacement or repair of components.

Priority	Component	Action
1	Cable N00-NS-P104 to N00-PL-P16	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 031 on page 1-80 to verify fix.
2	Node Supervisor Card	1. Replace card. 2. Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 3. Go to Step 031 on page 1-80 to verify fix.
3	Planar Board	1. Replace board. 2. Go to Step 031 on page 1-80 to verify fix.
4	All replaced	Call next level of support.

031

Component has been repaired or replaced.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– As processor node completes IPL, check the TTY console window.
– From the control workstation node front panel display, put the processor node in SERVICE mode.
– Put the circuit breaker at the front of the processor node in the On (‘1’) position.

Do you get any data on the TTY console screen?

Yes **No**

032

– Go to Step 030 on page 1-79 to service the next highest priority component.

033

Processor node IPLed in SERVICE mode.
– From the TTY console:

- Select “Advanced Diagnostic Routines”
- Select “System Verification”
- Select “Base System”

Does processor node pass all diagnostics?

Yes **No**

034

– Repair problem as indicated by diagnostics. Use “MAP 0130: Processor Node” on page 1-30 as necessary.

035

Problem resolved.
– Reboot node in NORMAL mode.
– Log into the node over the Ethernet:

telnet *nodename*

(Step **035** continues)

035 (continued)
– Enter the following command:

chcons /dev/tty0
– Go to “MAP 0570: End of Call” on page 1-357.

036

3-digit LED problem.
– Have the customer remove the processor node from the active configuration and power off the processor node.
– Put the circuit breaker at the front of the processor node in the Off (‘0’) position.
– Place processor node in service position.
– Refer to the following table for priority of replacement or repair of components.

Priority	Component	Action
1	Cable N00-NS-P106 to N00-PL-P23	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 037 to verify fix.
2	Node Supervisor Card	1. Replace card. 2. Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 3. Go to Step 037 to verify fix.
3	Planar Board	1. Replace board. 2. Go to Step 037 to verify fix.
4	All Replaced	Call next level of support.

037

Component has been repaired or replaced.
– Remove processor node from service position.
– Connect all cables at rear of processor node.
– From the control workstation, power on this processor node.
– From the control workstation, make sure the 3-digit LEDs for this processor node are displayed on the screen.
– Check the 3-digit LEDs for the IPL sequence.

Do the 3-digit LEDs indicate the IPL sequence?

Yes **No**

No:

038

– Go to Step 036 to service next highest priority component.

Yes:

039

– From the TTY console:

- Select “Advanced Diagnostic Routines”
- Select “System Verification”
- Select “Base System”

(Step **039** continues)

039 (continued)
Does processor node pass all diagnostics?
Yes **No**

040

– Repair problem as indicated by diagnostics. Use “MAP 0130: Processor Node” on page 1-30 as necessary.

041

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

042

Yellow or green LED on processor node is not functioning.
– Have the customer remove the processor node from the active configuration and power off the processor node.
– Put the circuit breaker at the front of the processor node in the Off (‘0’) position.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, ignoring PASS/FAIL results.
Do the yellow and green LEDs light at any time?
Yes **No**

043

– Place processor node in service position.
– Replace LED display card.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
Does green LED light at any time?
Yes **No**

044

– Replace the node supervisor card.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to verify replacement.
– Go to Step 046.

045

Problem resolved.
– Remove processor node from service position.
– Put the circuit breaker at the front of the processor node in the On (‘1’) position.
– Go to “MAP 0570: End of Call” on page 1-357.

046

All LEDs are operating.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put the circuit breaker at the front of the processor node in the On (‘1’) position.
(Step **046** continues)

046 (continued)
– Go to “MAP 0570: End of Call” on page 1-357.

MAP 0180: Thin Processor Node dc Short/Open

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

001

Problem in processor node power distribution detected by checking resistances of +5 V dc, +12 V dc, and/or –12 V dc to ground. The following table refers to I/O Planar jack N00-PL-J2:

Voltage	Measure From (positive lead)	To GND (negative lead)	Acceptable Range
+5 V dc	Pin 1 (red)	Pin 2 (black)	5 - 30 Ohms
+12 V dc	Pin 3 (yellow)	Pin 2 (black)	100 - 5000 Ohms
–12 V dc	Pin 9 (purple)	Pin 2 (black)	500 - 900 Ohms

Was resistance below acceptable range?

Yes **No**

002

Measured resistance is too high.

– Check for one or more of the following conditions:

- Open in planar power cable from node supervisor card N00-NS-J102 to I/O planar N00-PL-J2.
- Open voltage plane in I/O planar caused by a shorted component.

– Remove all adaptor cards, memory cards, fixed disk drives, and the CPU card from the I/O planar. Inspect components for damage.
– Remove I/O planar and inspect for damage.
– Replace any damaged components found during inspection.
– Continue at Step 009 on page 1-85.

003

Measured resistance is too low.

Are there any Micro Channel slots empty?

Yes **No**

004

Micro Channel power specifications may be exceeded by card requirements.

Has customer recently added or exchanged Micro Channel adaptors?

Yes **No**

005

– Go to Step 009 on page 1-85.

006

– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Remove the most recent adaptor(s) from this processor node.

(Step **006** continues)

006 (continued)
– Reinstall processor node, then power on the processor node from the control console.
Does this fix the problem?
Yes **No**

007

Problem still exists.
– Go to Step 009.

008

This adaptor was causing problem.
– Call next level of support.

009

– Clip multimeter leads to the connector pins of N00-PL-J2 for the voltage that shows resistance out of range.
– Remove affecting components (see chart below) until all components have been removed or resistance enters acceptable range.

Note: Parts are ordered by probable cause of failure. 'X' indicates voltage is used.

The following table refers to I/O Planar jack N00-PL-J2:

Voltage	Measure From (positive lead)	To GND (negative lead)	Acceptable Range
+5 V dc	Pin 1 (red)	Pin 2 (black)	5 - 30 Ohms
+12 V dc	Pin 3 (yellow)	Pin 2 (black)	100 - 5000 Ohms
–12 V dc	Pin 9 (purple)	Pin 2 (black)	500 - 900 Ohms

#	Component	+5 V dc	+12 V dc	–12 V dc
1	CPU card (Thin node or thin node 2)	X		
2	Memory card (slot A)	X		
3	Memory card (slot B)	X		
4	Micro Channel card (slot 1)	X	X	X
5	Micro Channel card (slot 2)	X	X	X
6	Micro Channel card (slot 3)	X	X	X
7	Micro Channel card (slot 4)	X	X	X
8	Ethernet riser card	X	X	X
9	Fixed disk drive(s)	X	X	

(Step **009** continues)

009 (continued)
Was a component replaced and the measured resistance now within range?
Yes **No**

010

– Remove the next highest priority component from list in Step 009 on page 1-85.
Did resistance increase to acceptable range?
Yes **No**

011

Component with short has not yet been located.
Have all components in the list been removed?
Yes **No**

012

– Return to Step 010 to pull next part.

013

– Replace the I/O planar board.
– Reinstall all other original components.
– Go to Step 009 on page 1-85 to verify the resistance.

014

– Replace component.
– Reinstall all other original components.
– Return to Step 009 on page 1-85 to verify the resistance.

015

– Reconnect planar power cable N00-PL-P2 at I/O planar board.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put the circuit breaker on the front of the processor node in the On (‘1’) position.
Does the processor node power on okay?
Yes **No**

016

– Call next level of support.

017

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

MAP 0190: Processor Node Function

001

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 High Performance Switch (HiPS) feature or Scalable POWERparallel Switch (SPS) 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.

Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

Refer to "Viewing Switch Partitions" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for locating and fencing/unfencing nodes within a switch partition.

Open the TTY to the failing node. Real-time error data can be observed that can help with problem determination and repair.

Processor problem detected by RS/6000 logic.

– From the system monitor on the control workstation or from Perspectives, obtain processor node front display.
  - Check 3-digit LEDs from the processor node front panel display.
  - If the LEDs display flashing ‘888’:
    – **For thin and wide processor nodes**, click on “RESET” button to read any sequence of numbers that follow; repeat RESET/read LEDs until LEDs display ‘888’ again.
    – **For 604 or 604e high processor nodes**, record values displayed after the ‘888’. If you see ‘---’ (three dashes), look at the 3-digit display. (Choose the 3-digit display from the “All Node Summary Display.”)
    – **For 332 MHz SMP or POWER3 SMP nodes**, use mouse button 3 on the 3-digit display for additional information.
    – **For SP-attached servers**, use mouse button 3 on the 3-digit display for additional information.

– Record the LED value or sequence for reference.

– Power off and power on processor node from the control workstation.

Are any different 8-digit LED values displayed during node power on or power off?

Yes **No**

002

Does processor node completely IPL?

Yes **No**

003

– Go to Step 008 on page 1-88.

004

– Check record of this processor node to see if it experiences excessive fails (more than one per week).

(Step **004** continues)

004 (continued)
Does this processor node experience frequent problems?
Yes **No**

005

– Record intermittent problem.
– Go to “MAP 0570: End of Call” on page 1-357.

006

– Call next level of support.

007

– Record the new LED value or sequence.
– Check the service process logs
– From the control workstation power off processor node.
– From node front panel display, click on “TTY” button to open a TTY console.
– From the TTY console:

- Select option 3 on the Main Menu
- Select option 4 on the System Information Menu

– Record the log information and clear the log.
– Go to “MAP 0100: Start of Service Call” on page 1-4 with the new error information.

008

– Use the following table to continue service:

Condition of LEDs	Action
• LEDs display **uuu** – Commonly used to indicate that processor node has completed IPL.	IPL okay. Treat as blank LEDs.
• LEDs display **u98** – Indicates processor node is IPLed in maintenance mode.	Refer to "Selecting a Processor Node Boot Response" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for more information.
• LEDs display **u**## or ##**u** – Indicates status of SP-unique software.	IPL or software installation in progress. If they do not change within 30 minutes, use the *IBM Parallel System Support Programs for AIX: Diagnosis Guide* to diagnose the software/hardware problem.
• LEDs stop at **103** during IPL – Problem with reset function.	Go to Step 024 on page 1-77, Step 024 on page 1-113, or Step 024 on page 1-138.
• LEDs stop at **200** during IPL – IPL attempted in SECURE mode.	1. From the node front panel, put processor node in SERVICE or NORMAL mode (as appropriate), then click on RESET to reset processor node. 2. If this reoccurs, go to “MAP 0170: Thin Processor Node Control” on page 1-74, “MAP 0230: Wide Processor Node Control” on page 1-110, or “MAP 0270: 604 or 604e High Node Control” on page 1-135 to fix mode switch problem.

Condition of LEDs	Action
• LEDs stop at **214/215** during IPL, • Obtained of the following RS/6000 SRNs: – 128- 100 through 195 – 143- 714/715/814/815 – 144- 514/515 – 146- 014/015/314/315 – 148- 111/112/114/115/190/197	1. Use power MAPs in RS/6000 Installation and Service Guide referencing “MAP 0140: Thin Node/Thin Node 2 Environment” on page 1-50, “MAP 0150: 120/160 MHz Thin Node Environment” on page 1-60, “MAP 0210: Wide Processor Node Environment” on page 1-98, or “MAP 0250: 604 or 604e High Node Environment” on page 1-124, as required. 2. Go to Step 009 on page 1-93 to check for any additional actions required to complete a FRU replacement.
• LEDs cycling through values in the **range 222 - 260** or a constant **269** during IPL. – Processor node is unable to boot.	Go to “MAP 0200: Processor IPL Problem” on page 1-94.
• LEDs stop at **262** during IPL	1. If processor node mode switch is not set for SERVICE mode, go to “MAP 0170: Thin Processor Node Control” on page 1-74, “MAP 0230: Wide Processor Node Control” on page 1-110, or “MAP 0270: 604 or 604e High Node Control” on page 1-135 to fix mode switch problems. 2. From the node front panel, click on “OPEN TTY” to open the TTY console on this processor node. 3. Press ‘1’ then ENTER in the TTY console window. 4. SERVICE IPL should continue.
• LEDs stop at **292** during IPL	Problem configuring SCSI/SSA/serial device. If the failing device is the device you want to boot from, or is another device in the boot chain (before your device), the system will not boot. To isolate the problem, minimum configuration of DASD bootable adapters may be required. See "Diagnosing an LED 292 Hang Condition" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
• LEDs stop at **553** or **570** during IPL	Problem configuring SCSI device. 1. If processor is currently booting from disk, go to “MAP 0200: Processor IPL Problem” on page 1-94. 2. If processor is booting over network and other devices are still attached, disconnect SCSI cable(s) from SCSI MCA or I/O planar, then go to Step 003 on page 1-95. 3. If processor is booting over network and no devices are attached, at SCSI MCA or I/O planar, then replace SCSI MCA or I/O planar.
• LEDs stop at constant **83u** OR **888-103-762-xxx** – Problem with HiPS Adapter-2 or SP Adapter.	Go to “MAP 0540: Switch Function” on page 1-322 **Note:** LED **83u** corresponds to SRN of type 83C-*xxx*.
• LEDs stop at **862** during IPL – Problem with BMCA feature.	Go to “MAP 0560: Block Multiplexer Channel Adapter (BMCA)” on page 1-353.

Condition of LEDs	Action
• LEDs stop at **constant 888** (followed by no other sequence of numbers) – IPL not starting.	1. Remove processor node from frame. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for these procedures. 2. Check for proper seating of cards in the processor node, especially the CPU planar and the supervisor card. 3. If this is a thin node, perform Step 010 on page 1-51. If the answer is no, continue with service at Step 011 on page 1-51; otherwise, the SRN is 101-888; use SRN table in *Diagnostic Information for Micro Channel Bus Systems* (SA38-0532) or *Diagnostic Information for Multiple Bus Systems* (SA38-0509). 4. If this is a wide node, perform Step 008 on page 1-99. If the answer is no, continue with service at Step 009 on page 1-100; otherwise, the SRN is 101-888; use SRN table in *Diagnostic Information for Micro Channel Bus Systems* (SA38-0532) or *Diagnostic Information for Multiple Bus Systems* (SA38-0509). 5. If this is a high node, go to “MAP 0280: 604 or 604e High Node Minimum Configuration” on page 1-145.
• LEDs stop at constant **980** – Problem with HiPS adapter-1.	Go to “MAP 0540: Switch Function” on page 1-322.
• LEDs stop at **c20 - c29** during IPL – Node boot information corrupted.	Call software support.
• LEDs stop at **c31** during IPL	1. From the node front panel, click on “OPEN TTY” to open the tty console on this node. 2. Press “1” then ENTER in the tty console window. 3. Service IPL should continue.
• LEDs at **888-103** followed by this sequence of numbers: – 409-008 – 409-022	1. Remove processor node from frame. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for these procedures. 2. Check for proper seating of cards and cables on IOD. 3. Check flex cables for damage and freedom of motion on the “floating” connector. 4. Change any suspected problem flex cables. 5. Go to “MAP 0280: 604 or 604e High Node Minimum Configuration” on page 1-145.
• LEDs at **888** followed by this sequence of numbers: – 409-070/073/074/075 – 409-076/077/078/079 – 409-093/094/095/096	Go to *Diagnostic Information for Micro Channel Bus Systems* (SA38-0532) or *Diagnostic Information for Multiple Bus Systems* (SA38-0509) to decode the fan number information. Then go to MAP 0250: 604 or 604e High Node Environment, Step 034 on page 1-128.

Condition of LEDs	Action
• 8-Digit LED: – 25Cxxxxx	• Use mouse button 3 on the 3-digit display to see the Additional Info popup, or use `hmmon -GQ Frame Node` Go to the location codes in *RS/6000 SP: Maintenance Information, Volume 3* for a description of **P1-mx.x**. For 332 MHz SMP Node memory card - DIMM locations, refer to "Location Diagrams of the RS/6000 SP Components" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. • If DIMM replace did not fix the problem, call next level of support.
• All other 8-digit LED values (other than 25Cxxxxx) and 4-digit LED values.	Go to the "Error Code to FRU Index" in *RS/6000 SP: Maintenance Information, Volume 3*.

Condition of LEDs	Action
• All other constant LED values • LEDs at **888** followed by any other sequence of numbers	**Go to the RS/6000 start MAP in the** *Diagnostic Information for Micro Channel Bus Systems* **(SA38-0532) or** *Diagnostic Information for Multiple Bus Systems* **(SA38-0509) to check SRN.** **Note:** Refer to Table 1-6 on page 1-33,in this publication, to find the equivalent RS/6000 model. Use the failing function code and description to perform service or to replace the most probable failing component. Refer to *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for processor node locations and removal and replacement procedures, or *RS/6000 SP: Maintenance Information, Volume 4* for part numbers, as required. **Notes:** 1. If the SRN indicates a memory problem, check that all the memory is of the same operating speed, and you should also consider the CPU and planar as potential FRUs. 2. If this is a 135 MHz wide processor node, and the SRN indicates a problem with the CPU, change the V dc converter daughter card before replacing the CPU card. 3. If this is a 604 or 604e high node, consider lateral planar 1 card and lateral planar 2 card as possible cause of this problem. If directed to the *7015 Models R30, R40, and R50 CPU Enclosure Installation and Service Guide* Map 1540, use “MAP 0280: 604 or 604e High Node Minimum Configuration” on page 1-145 in this volume. 4. If this is a SP-attached server (RS/6000 Machine Type 7017-S70 and S7A), consult the *RS/6000 Enterprise Servers S70 and S7A Installation and Service Guide* to perform any required service action. **Note:** Before disconnecting cables or performing service actions on an SP-attached server, perform "Decoupling and Coupling Code for SP-Attached Servers" in *RS/6000 SP: Maintenance Information, Volume 3*. Then run diagnostics from SERVICE mode as described in "Running Diagnostics in a Processor Node" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
• Machine check (604 and 604e high processor nodes)	Go to "Diagnosing a Machine Check (604 or 604e High Node)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

– Continue at Step 009 on page 1-93.

009

(Step **009** continues)

009 (continued)

– Check the following table for any additional actions that must be performed to recover use of the processor node following certain FRU replacements.

Note: The procedures in this table can be found by the customer in *IBM RS/6000 SP: Administration Guide*, under the section entitled “Reconfiguring the RS/6000 SP System”.

Replaced Part	Required Customer Action
• System I/O Planar (Thin processor node) • Ethernet adapter in Micro Channel slot 1 (Wide or 604 (or 604e) high processor node)	Have customer perform "Updating the Ethernet Hardware Address" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
Fixed Disk #1 (Boot DASD)	Have customer perform the following steps to reinstall an AIX image on this DASD. 1. Use the **spbootins** command to select a boot_response of “install”: a. Determine *frame#* and *slot#* of this processor node. b. Issue the following command from the control workstation: **spbootins -r install** *frame# slot#* **1** 2. From the “Global Controls” window, perform a **Network boot** on this processor node. 3. The processor node should boot and install AIX on fixed disk #1.

Has the processor node been recovered?

Yes **No**

010

Have all the parts listed in *Diagnostic Information for Micro Channel Bus Systems***, (SA38-0532) or** *Diagnostic Information for Multiple Bus Systems***, (SA38-0509) and** *Adapters, Devices and Cable Information***, (SA38-0533) been replaced?**

Yes **No**

011

– Replace next priority part.
– Go to Step 009.

012

– Call next level of support.

013

– Go to “MAP 0570: End of Call” on page 1-357.

MAP 0200: Processor IPL Problem

Processor node does not IPL. The 3-digit LEDs continuously cycle within the range 222-260 or a constant 269 (see Step 008 on page 1-88). Record this value for later use.

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for either placing a processor node into service position, or removing it from service position.

001

The file system for each processor node may reside on an internal fixed disk or an externally attached device. Enter the command:

splstdata -b

to check the *response* field.

– Determine the IPL device for this processor node.
– The list below helps determine the IPL devices; however, customers may have customized configurations.

Condition	Default IPL Device
Thin/wide/high processor node: • Normal operation • Response field indicates “disk” • Problem with SCSI device	Boot disk (most likely disk #1)
Wide processor node: • Response field indicates “install,” “customize,” or “maintenance”	Micro Channel Ethernet adapter
High processor node: • Response field indicates “install,” “customize,” or “maintenance”	Micro Channel Ethernet adapter
Thin processor node: • Response field indicates “install,” “customize,” or “maintenance”	Integrated Ethernet card

– Go to Step 002.

002

– Use the following table to continue service:

IPL Device	Action
Boot disk	Go to Step 003 on page 1-95.
Integrated Ethernet card	Go to “MAP 0500: Ethernet LAN” on page 1-288, to isolate a software problem affecting this processor node’s Ethernet LAN connection.
Micro Channel Ethernet adapter	Go to “MAP 0500: Ethernet LAN” on page 1-288, to isolate a software problem affecting this processor node’s Ethernet LAN connection.

003

– Problem IPLing from boot disk.

- Determine the normal boot disk by entering the **splstdata -b** command and checking the *install_disk* field.
- Prepare to IPL and run diagnostics from Ethernet LAN by performing the procedure in "Basic Stand-Alone Mode (From Network Boot) in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for this processor node.

Does the processor node IPL?

Yes **No**

004

Processor node does not complete IPL over Ethernet.

– Recheck procedures in Step 003 for any mistakes.

Is there an obvious problem?

Yes **No**

005

Problem may be in software or hardware.

– Check the 3-digit display for this processor node for non-blank values.

Do you get a problem indication in the 3-digit display?

Yes **No**

006

Probable software problem.

– Call next level of support.

007

– Go to “MAP 0190: Processor Node Function” on page 1-87 to continue service.

008

– Fix the obvious problem(s).

– Go to Step 003 to continue service.

009

Processor node has completed IPL in maintenance mode.

– For the following steps, refer to "Basic Stand-Alone Mode (From Network Boot) in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

– Check device list for a SCSI device like:

- “scsi0” (SCSI port on I/O planar)
- ““ascsi...”, “vscsi1...” (SCSI MCA).

– Check device list for the problem “hdisk...” (fixed disk).

– For all appropriate “scsi0”, “vscsi...”, and “hdisk...” devices, run diagnostics against the device and check results.

(Step **009** continues)

009 (continued)
Does device list include "hdisk..." and does diagnostics pass for "hdisk..."?
Yes **No**

010

Problem detected.
– Note any diagnostic results before continuing.
– Put the circuit breaker(s) at the front of the processor node in the Off ('0') position.
– Go to Step 011.

011

– Ensure that the processor node is in service position.
– Use the following prioritized table to continue service:

Priority	Condition	Action
1	• Device list does not include any device(s) like "scsi0" or "ascsi0". • Diagnostics fail for device(s) like "scsi0" or "ascsi0".	1. If diagnostics indicate the cause of failure, perform service based on the diagnostics results, then go to Step 012. 2. Replace I/O planar. 3. Go to Step 012.
2	• Device list does not include any SCSI MCAs like "ascsi..." or "vscsi...". • Diagnostics fail for SCSI MCAs "ascsi..." or "vscsi...".	1. If diagnostics indicate the cause of failure, perform service based on the diagnostics results, then go to Step 012. 2. Replace SCSI MCA card. 3. Go to Step 012.
3	• Device list does not include the problem "hdisk..." • Diagnostics fail for the problem "hdisk...". • "hdisk missing"	1. Check the SCSI bus cables (and SCSI riser card if present) for a loose connection or damaged cable, especially at this disk. Also check for a loose or missing terminator. (For 604 and 604e high nodes, refer to the media drawer diagram in "Removing the 604 or 604e High Node DASD" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* showing the SCSI path and power cable.) 2. Check the power cables for this disk at both ends for a loose connection or damaged cable. 3. Check DASD addressing. Refer to *Adapters, Devices, and Cable Information for Micro-Channel Bus Systems*, SA38–0533, for the required jumper information. 4. If a cable problem is found, repair or replace cable, then go to Step 012. 5. If no cable problem is found, replace disk, then go to Step 012.
4	Diagnostics pass for the problem "hdisk...".	Go to Step 013 on page 1-97.

012

Component repaired or replaced.
– Put the circuit breaker(s) at the front of the processor node in the On ('1') position.
(Step **012** continues)

012 (continued)
– Go to Step 003 on page 1-95 to continue service.

013

Diagnostics pass for both SCSI port and boot disk.
– Refer to "Basic Stand-Alone Mode (From Network Boot) in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to exit from the verification menu.
– Change boot response to “disk”, using "Selecting a Processor Node Boot Response" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Did you replace the boot disk?

Yes **No**

014

– From the control workstation, power off and on this processor node.

Does this processor node IPL?

Yes **No**

015

Probable software problem (AIX image on boot disk may not be functional).
– Call next level of support.

016

– Go to Step 017.

017

Hardware problem resolved.
– Inform the customer to use the appropriate procedures in *IBM RS/6000 SP: Administration Guide* to reinstall (or recover) an AIX image on the fixed disk.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Go to “MAP 0570: End of Call” on page 1-357.

MAP 0210: Wide Processor Node Environment

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

001

System monitor log reports “Warning”, “Shutdown”, or “Failure” message associated with processor node.
Does message indicate “Shutdown” or “Failure”?
Yes **No**

002

Message is a warning only.
Does this same message occur on more than one processor node?
Yes **No**

003

No immediate service required.
– Preventative maintenance can be done now by returning to Step 001, and treating the message as a “Shutdown” or “Failure” message, or service can be deferred until a later date.

004

– Notify next level of support.

005

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 the following table to continue service:

Condition	Action
“...P48OK...”	Go to “MAP 0220: Wide Processor Node Power” on page 1-105.
“...shutdownP5m...” “...shutdownP4...” “...shutdownP5i...” “...shutdownP12...” “...shutdownN12...”	Go to Step 006.
“...fanfail...”	Go to Step 015 on page 1-101.
“...shutdownTemp...”	Go to Step 019 on page 1-102.
“...memoryProtect...”	Go to Step 030 on page 1-104.

006

(Step **006** continues)

006 (continued)
One or more of the following conditions exist:

Voltage out of range: +4 V “shutdownP4”
Voltage out of range: +5 VM “shutdownP5m”
Voltage out of range: +5 VI “shutdownP5i”
Voltage out of range: +12 V “shutdownP12”
Voltage out of range: –12 V “shutdownN12”
Planar power problem: +4 V, +5 VM, +5 VI, +12 V, or –12 V

– Place processor node in service position.
– Remove power compartment cover.
– Check cable conditions at node supervisor card N00-SV-J102 and power card N00-PC-J60. Check condition of cable wires, especially J60 pin 37 to J102 pin 11, and the appropriate connection (based on message) shown below:

Voltage	Power Card - J60	Node Supervisor - J102
+4 V	N00-PC-P60 pin 3	N00-SV-P102 pin 29
+5 VM	N00-PC-P60 pin 1	N00-SV-P102 pin 27
+5 VI	N00-PC-P60 pin 5	N00-SV-P102 pin 31
+12 V	N00-PC-P60 pin 7	N00-SV-P102 pin 33
–12 V	N00-PC-P60 pin 10	N00-SV-P102 pin 35

Does the power control/sense cable appear to be okay?
Yes **No**

007

Problem with node supervisor control cable (N00-SV-P102).
– Go to Step 015 on page 1-101, Priority 4, to replace cable.

008

– Disconnect cable at N00-SV-J102 and N00-PC-J60.
– Based on the message, use the information in the table below to disconnect the appropriate cable and check resistance between the cable pins.

Voltage	Cable	From (positive lead)	To GND (negative lead)	Acceptable Range (in ohms)
+4 V	N00-PC-P16A	Pin 4	Pin 10	6 - 25
+5 VM	N00-PC-P13A	Pin 4	Pin 10	1K - 5M
+5 VI	N00-PC-P40A N00-PC-P45 N00-PC-P65	Pin 10 Pin 4 Pin 4	Pin 1 Pin 3 Pin 3	10 - 30 100 - 500* 100 - 500*
+12 V	N00-PC-P40A N00-PC-P45 N00-PC-P65	Pin 6 Pin 1 Pin 1	Pin 1 Pin 2 Pin 2	800 - 100K 1K - 5K* 1K - 5K*
–12 V	N00-PC-P40A	Pin 3	Pin 1	1K - 20K*
Note: *Resistance range assumes DASD(s) attached on this cable. With no DASD(s) attached, an open will be measured.				

(Step **008** continues)

008 (continued)
Are all measured resistances in the acceptable range?
Yes **No**

009

– Leaving cable where resistance was measured in Step 008 on page 1-99 disconnected, disconnect other end(s) of cables from all devices.
– The following list shows cable connections:

Cable (short detected)
N00-PC-P16A: CPU planar J16
N00-PC-P13A: CPU planar J13, J14
N00-PC-P40A: I/O planar J40, J41
N00-PC-P45: DASD P3, DASD P4
N00-PC-P65: DASD P1, DASD P2

– When the cable is entirely disconnected, check for short between voltage and GND pins per table from Step 008 on page 1-99.

Does disconnected cable show a short condition?
Yes **No**

010

– Reconnect cable at locations shown in Step 009.
– Go to "MAP 0240: Wide Processor Node dc Short/Open" on page 1-120.

011

– Replace cable.
– Reconnect all cables inside the processor node.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breaker at front of processor node in On ('1') position.
– Go to "MAP 0570: End of Call" on page 1-357.

012

– Replace the components listed in the table below, one at a time:

Priority	Component
1	Node power card
2	Wide node supervisor card
3	Cable N00-SV-P102
4	Call next level of support

– Reconnect all cables inside processor node.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breaker at front of processor node in On ('1') position.
– Wait 20 seconds, then check Environmental (Yellow) LED for flashing condition.
(Step **012** continues)

012 (continued)
Is the Environmental (Yellow) LED flashing?
Yes **No**

013

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

014

– Put circuit breaker in front of processor node in the Off (‘0’) position.
– Place processor node in service position.
– Remove power compartment cover.
– Go to Step 012 on page 1-100 to service next component.

015

– One or more of the following conditions exist:
  - Warning Fan: “fanwarning1”, “fanwarning2”, ..., “fanwarning5”
  - Shutdown Fan: “fanfail1”, “fanfail2”, ..., “fanfail5”
– Place processor node in service position.
– Use the following table to reseat or replace components:

Priority	Component	Action
1	Fan 1, 2, 3, 4 or 5	1. Check specified fan for blockage or loose cable connection. 2. Fix any obvious problem(s). If none are found, continue at Priority 2. 3. Continue at Step 016 on page 1-102.
2	Fan 1, 2, 3, 4 or 5	1. Replace fan as described in "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 2. Continue at Step 016 on page 1-102.
3	Node supervisor card	1. Replace card. 2. Continue at Step 016 on page 1-102.
4	Node supervisor control cable	1. Replace cable. Refer to Figure 1-16 on page 1-102, for cable connections. 2. Continue at Step 016 on page 1-102.
5	All replaced	Call next level of support.

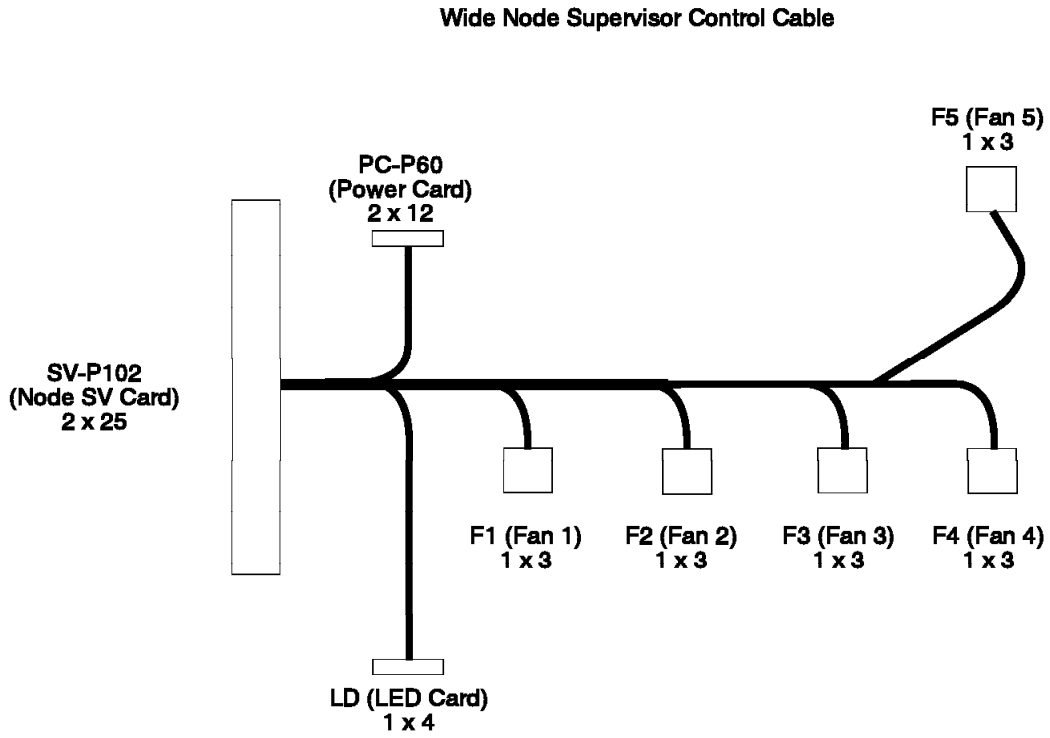

Figure 1-16. Wide Node Supervisor Control Cable

016

Component replaced or reseated.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breaker at the front of processor node in the On (‘1’) position.
– Check the Environmental (yellow) LED for an ON or FLASHING condition.

Is the Environmental (yellow) LED ON or FLASHING?

Yes **No**

017

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

018

– Put circuit breaker at the front of the processor node in the Off (‘0’) position.
– Go to Step 015 on page 1-101 to service next highest priority component.

019

Over temperature condition: “shutdownTemp”

Temperature is out of specified range; however, no serious electrical current or fan speed problems have been detected.

– Check for airflow blockage at air intakes and exhaust of the processor node and system frame. Also, check air temperature around the frame, looking for sources of abnormally high temperatures (above 40°C or 104°F).

Is there an obvious airflow blockage or abnormally high temperature source near air intakes?
Yes **No**

020

Problem in node supervisor card.
– Place processor node in service position.
– Replace node supervisor card.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does card pass self-test?
Yes **No**

021

– Go to Step 024.

022

Node supervisor card is okay.
– Put circuit breaker at the front of the processor node in the On ('1') position.
– Check Environmental (yellow) LED for ON or FLASHING condition.

Is Environmental (yellow) LED ON or FLASHING?
Yes **No**

023

Problem resolved.
– Remove processor node from service position.
– Go to "MAP 0570: End of Call" on page 1-357.

024

– Check cable connections to node supervisor card.

Are there any obvious problems such as a loose or broken cable?
Yes **No**

025

– Call next level of support.

026

– Fix obvious problem.
– Go to Step 022.

027

– Place processor node in service position.
– Power off the processor node, and remove blockage.
– Reconnect all cables at rear of the processor node.
– With Environmental (yellow) LED Off, power on the processor node.
(Step **027** continues)

027 (continued)
Does the processor node IPL?
Yes **No**

028

Processor has problem with IPL.
– Go to "MAP 0130: Processor Node" on page 1-30.

029

Problem resolved.
– Remove processor node from service position.
– Go to "MAP 0570: End of Call" on page 1-357.

030

Memory protection error: "memoryProtect"

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

Have memory parts been changed recently (since last successful IPL) in this processor node?
Yes **No**

031

Problem may be: base memory card, CPU card, I/O planar, or node supervisor control cable.
– Replace parts, one at a time, until problem is corrected.
Are you able to correct the problem?
Yes **No**

032

Call next level of support.

033

Problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

034

Check memory card and SIMM part numbers in *Diagnostic Information for Micro Channel Bus Systems*, (SA38-0532) and *Adapters, Devices and Cable Information*, (SA38-0533) to ensure that they are compatible with the fastest Type 7013 machines.
– If necessary, call next level of support.

MAP 0220: Wide Processor Node Power

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

001

– From the system monitor, check the Power (green) LED for this processor node.
The definition of the Power (green) LED is as follows:

Power (Green)

Off	No 48 V dc power available at processor node.
Flashing	Power available at processor node, but RS/6000 logic is Off.
On	Power available at processor node, and RS/6000 logic is On.

Is Power (green) LED Off?
Yes **No**

002

Processor node getting 48 V dc power.
Is Power (green) LED flashing?
Yes **No**

003

Power (green) LED is On, indicating no problem with power supply.
– Verify that you have the proper processor node, then go to “MAP 0130: Processor Node” on page 1-30.
– If this is the proper processor node, call the next level of support.

004

Processor node is getting power.
– Power on RS/6000 logic from the virtual front panel on the control workstation.
Does Power (green) LED light and stay lit?
Yes **No**

005

Processor node not responding to the command.
– Go to “MAP 0110: Supervisor Subsystem” on page 1-10.

006

RS/6000 logic getting power.
Does processor node IPL successfully?
Yes **No**

007

Processor node has problem with IPL.
– Go to “MAP 0130: Processor Node” on page 1-30.

008

No problem detected.
– Record reason for power-off condition.
– Go to “MAP 0570: End of Call” on page 1-357.

009

– Go to Step 010

010

– Check circuit breaker at front of processor node. Put this circuit breaker in the On (‘1’) position if it is not already.

Does the circuit breaker go (trip) to the Off (‘0’) position?

Yes **No**

011

– Go to Step 015 on page 1-107.

012

– Place processor node in service position.
– Check node power harness (at power card N00-PC-P1 and N00-PC-P2 and circuit breaker) inside processor node for any obvious problems which might cause a short.

Does node power harness appear okay?

Yes **No**

013

– Fix obvious problem(s). If necessary, replace node power harness.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Go to Step 010.

014

– Put circuit breaker in On (’1’) position.
– Using multimeter, check for a short between either tab of circuit breaker and a dc converter heatsink screw on the power card.
– Perform ‘Actions’ from table one at a time until 48 V short disappears:

Order	Action	Replace
1	Unplug P102 from node supervisor.	Node supervisor card.
2	Unplug P60 from power card.	Replace N00-PC-P60 cable.
3	Both unplugged.	Replace node power card.

– If “Action” above removes short condition, replace the corresponding part in the “Replace” column.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Go to Step 010.

015

– From control workstation or processor node, check Power (green) LED for this node.

Is Power (green) LED Off?

Yes **No**

016

Processor node problem resolved.

– Go to "MAP 0570: End of Call" on page 1-357.

017

– Check processor node(s) on any other dc power harness for any that are powered on. Ensure that the other processor node has its circuit breaker in the On ('1') position.
– Check the Power (green) LED for an On or Flashing condition.
– Processor nodes receive 48-volt power through one of four power harnesses. The sets of processor nodes are as follows:

```
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
```

Is the Power (green) LED on any other processor node On or Flashing?

Yes **No**

018

– Go to "MAP 0370: Main Power" on page 1-222.

019

– Check all other processor nodes on the same dc power harness as the failing processor node to check for the same symptom - circuit breaker on but Power (green) LED not lit.

Is this the only processor node showing this symptom?

Yes **No**

020

Problem with 48 V dc power distribution.

– Go to "MAP 0480: Open in 48 V dc Distribution" on page 1-283.

021

– Check cable connection at processor node tailgate N00-BH-J8 for a good connection.

Is there a good connection?

Yes **No**

022

– Fix cable connection problem.
– Go to Step 015.

023

– Go to Step 024 on page 1-108

024

– Put circuit breaker at front of processor node in the Off (‘0’) position.
– Place processor node in service position.
– Put circuit breaker at front of processor node in the On (‘1’) position
– Unplug node 48 V dc harness from node power card at N00-PC-P2 (black wire).
– Using a digital multimeter, check for continuity from node tailgate N00-BH-J8 pin 1 to N00-PC-P2 (black wire).

Is there continuity?

Yes **No**

025

– Check continuity between two tabs of processor node circuit breaker.

Is there continuity?

Yes **No**

026

Problem with circuit breaker.
– Replace processor node circuit breaker.
– Replug N00-PC-P2.
– Go to Step 031 to verify fix.

027

Problem with node 48 V dc harness inside processor node.
– Replace the node 48 V dc harness N00-PC-P2 inside this processor node.
– Go to Step 031 to verify fix.

028

– Unplug power service cable at node supervisor card N00-SV-J102 and node power card N00-PC-J60.
– Check cable continuity between N00-SV-P102 pin 39 and N00-PC-P60 pin 15.

Is there continuity?

Yes **No**

029

– Replace cable N00-SV-P102. Refer to Figure 1-16 on page 1-102 for cable connections.
– Go to Step 031 to verify fix.

030

– Replace the node power card. Make sure to replug all cables, including the node power harness.
– Go to Step 031 to verify fix.

031

– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breaker at front of processor node in the On (‘1’) position.
– Check Power (green) LED for an OFF condition.

(Step **031** continues)

031 (continued)
Is the Power (green) LED OFF?
Yes **No**

032

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

033

Problem with the 48 V dc power distribution to this processor node.
– Go to “MAP 0480: Open in 48 V dc Distribution” on page 1-283.

MAP 0230: Wide Processor Node Control

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 High Performance Switch (HiPS) feature or Scalable POWERparallel Switch (SPS) 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.

Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

Refer to "Viewing Switch Partitions" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for locating and fencing/unfencing nodes within a switch partition.

001

Processor node problem detected by customer or CE.
– Use the following table to continue service:

Condition	Action
• 3-digit LEDs displayed but missing segments or remain blank	Go to Step 036 on page 1-117.
• Node will not reset • Mode switch problem—problem setting NORMAL, SECURE, or SERVICE.	Go to Step 002.
• No response from TTY console	Go to Step 026 on page 1-114.
• Yellow or green LEDs on node will not light.	Go to Step 042 on page 1-118.

002

Node will not reset or mode switch problem.
– Check with customer to make sure this processor node is not in the current active configuration. If processor node is *not* operational and actively working at this time, continue service. If it *is* operational and actively working, schedule a time convenient for the customer.
– From the control workstation, open the node front panel display.
– Make note of the mode switch position for this processor node.
– Set mode switch to something other than that recorded above.
– If not already there, set the mode switch to SERVICE.

Note: Do NOT recycle node power until reset fault is verified

.

Does the mode switch fail to toggle?
Yes **No**

003

– Problem not related to mode switch.
(Step **003** continues)

003 (continued)
Was mode originally in SERVICE position as noted in previous step?
Yes **No**

004

– Customer may have tried to reset processor node in SECURE mode. Reset will only take effect in NORMAL or SERVICE modes.
– From the control workstation, reset this processor node.
Does processor node reset?
Yes **No**

005

– Problem with reset.
– Go to Step 012 on page 1-112

006

– No problem found
– Inform customer that the processor node will not reset if the mode switch is in the SECURE position.
– Go to "MAP 0570: End of Call" on page 1-357.

007

– From the control workstation, issue reset from this processor node.
Does the processor node reset?
Yes **No**

008

– Problem with reset.
– Go to Step 012 on page 1-112.

009

– Intermittent problem may be occurring.
– Record the following:

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

– Check logs to see if this fault has been previously recorded.
Is this a recurring fault?
Yes **No**

010

– This is not a recurring failure.
– Go to "MAP 0570: End of Call" on page 1-357.

011

(Step **011** continues)

011 (continued)
– Reoccurrence of intermittent fault has been detected.
– Treat this fault as a solid failure.
– Go to Step 024 on page 1-113.

012

– From the control workstation node front panel display:

- Power-off processor node.
- Power-on processor node.
- Check 3-digit LEDs for LED sequence indicating IPL.

Do the 3-digit LEDs change?
Yes **No**

013

Node supervisor card not responding to commands.
– Go to "MAP 0110: Supervisor Subsystem" on page 1-10.

014

Processor node is IPLing.
Do 3-digit LEDs eventually indicate completion of IPL sequence (i.e. blank or "uuu")?
Yes **No**

015

Processor node has problem IPLing.
Do 3-digit LEDs stop at constant 200?
Yes **No**

016

– Go to Step 008 on page 1-88 to continue service.

017

Problem with SECURE signal.
– Go to Step 024 on page 1-113 to continue service.

018

– From node front panel display, click on "TTY" button to open a TTY console.
– From the TTY console:

- Select "Advanced Diagnostic Routines"
- Select "System Verification"
- Select "Base System".

– Follow directions for the "Key Mode Switch Test", setting the mode switch from the processor node's front panel on the control workstation.
(Step **018** continues)

018 (continued)
Does this test indicate a failure?
Yes **No**

019

– From the control workstation, reset this processor node.
Does processor node reset?
Yes **No**

020

Problem with reset.
– Go to Step 024 to continue isolation.

021

Node reset and mode switches functioning properly.
Was this a solid problem? (If the problem was cleared by power-on only, answer No.)
Yes **No**

022

This is an intermittent problem.
– Please record following tracking information:

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

– Go to “MAP 0570: End of Call” on page 1-357.

023

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

024

Problem with reset or mode switch function.
– From the control workstation, power off processor node.
– Place processor node in service position.
– Use the following prioritized table to continue service:

Priority	Component	Action
1	Cable N00-SV-PS39 to N00-PL-P39	1. Check for proper seating and opens/shorts. See Table 1-8 on page 1-114. If no problem is found, continue at Priority 2. 2. Repair or replace cable assembly as required. 3. Go to Step 025 on page 1-114 to verify fix.
2	Cable N00-PL-P40 to N00-PC-P40 and N00-PC-P41	1. Check for proper seating and opens/shorts. See Table 1-8 on page 1-114. If no problem is found, continue at Priority 3. 2. Repair or replace cable assembly as required. 3. Go to Step 025 on page 1-114 to verify fix.
3	Wide Node Supervisor Card	1. Replace card. 2. Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 3. Go to Step 025 on page 1-114 to verify fix.
4	I/O Planar Board	1. Replace board. 2. Go to Step 025 on page 1-114 to verify fix.
5	All replaced	Call next level of support.

Node supervisor card N00-NS-JS39 to I/O planar N00-PL-J39 cable check points:

Table 1-8. Cable Continuity Check Points

Signal	From	To
Reset	N00-SV-PS39 pin A12	N00-PL-P39 pin 7
Service	N00-SV-PS39 pin A13	N00-PL-P39 pin 3
Secure	N00-SV-PS39 pin B12	N00-PL-P39 pin 2

025

Component has been repaired or replaced.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put the circuit breaker at the front of the processor node in the On (‘1’) position.
– Go to Step 014 on page 1-112 to continue service.

026

No response from TTY console for a processor node.
– Make sure processor node was IPLed in NORMAL mode.
–

From system file server, telnet into this processor node:

telnet *nodename*

– Log in as “root”.
– Have the customer check to make sure that the TTY port on the processor node is correctly defined.

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

   smit console

Use the menu options to check and/or 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.

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

   smit tty

   Use the menu options to check and/or reconfigure the “s1” TTY port as required. The proper TTY parameters are listed in *IBM RS/6000 SP: Administration Guide*.

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

Yes **No**

027

TTY not responding due to customer configuration.
- Customer must configure these parameters.
- Go to “MAP 0570: End of Call” on page 1-357.

028

Problem due to hardware.
- Close console TTY window (if already open).
- Log into the node over the Ethernet:

  telnet *nodename*

- Enter the following command:

  chcons /dev/tty1

- Use **diag** command to run regular (not advanced) diagnostics on “TTY0”.

Do the diagnostics pass (no problem found)?

Yes **No**

029

- Replace I/O planar board.
- Go to Step 031 on page 1-116.

030

- Log into the node over the Ethernet:

  telnet *nodename*

- Enter the following command:

  chcons /dev/tty0

- From the control workstation, make sure the node front panel display is open.
- Close TTY console at this time.
- Have the customer remove the processor node from the active system configuration and power off the processor node.
- Put the circuit breaker at the front of the processor node in the Off (‘0’) position.
- Place processor node in service position.
- Refer to the following table for priority of replacement or repair of components.

Priority	Component	Action
1	Cable N00-SV-PS37 to N00-PL-P37	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 031 on page 1-116 to verify fix.
2	Cable N00-PC-P40 to N00-PL-P40 and N00-PL-P41	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 031 on page 1-116 to verify fix.
3	Wide Node Supervisor Card	1. Replace card. 2. Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 3. Go to Step 031 on page 1-116 to verify fix.
4	I/O Planar Board	1. Replace board. 2. Go to Step 031 on page 1-116 to verify fix.
5	All replaced	Call next level of support.

031

Component has been repaired or replaced.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– As processor node completes IPL, check the TTY console window.
– From the control workstation node front panel display, put the processor node in SERVICE mode.
– Put the circuit breaker at the front of the processor node in the On (‘1’) position.

Do you get any data on the TTY console screen?

Yes **No**

032

– Go to Step 030 on page 1-115 to service next highest priority component.

033

Processor node IPLed in SERVICE mode.
– From the TTY console:

- Select “Advanced Diagnostic Routines”
- Select “System Verification”
- Select “Base System”

Does processor node pass all diagnostics?

Yes **No**

034

– Repair problem as indicated by diagnostics. Use “MAP 0130: Processor Node” on page 1-30 as necessary.

035

Problem resolved.
(Step **035** continues)

035 (continued)
– Go to “MAP 0570: End of Call” on page 1-357.

036

3-digit LED problem.
– Have the customer remove the processor node from the active system configuration and power off the processor node.
– Put the circuit breaker at the front of the processor node in the Off (‘0’) position.
– Place processor node in service position.
– Refer to the following table for priority of replacement or repair of components.

Priority	Component	Action
1	Cable N00-SV-PS39 to N00-PL-P39	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 037 to verify fix.
2	Cable N00-PC-P40 to N00-PL-P40 and N00-PL-P41	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 037 to verify fix.
3	Wide Node Supervisor Card	1. Replace card. 2. Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 3. Go to Step 037 to verify fix.
4	I/O Planar Board	1. Replace board. 2. Go to Step 037 to verify fix.
5	All Replaced	Call next level of support.

037

Component has been repaired or replaced.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– From the control workstation, power on this processor node.
– From the control workstation, make sure the 3-digit LEDs for this processor node are displayed on the screen.
– Check the 3-digit LEDs for the IPL sequence.

Do the 3-digit LEDs indicate the IPL sequence?

Yes **No**

038

– Go to Step 036 to service next highest priority component.

039

– From the TTY console:

- Select “Advanced Diagnostic Routines”

(Step **039** continues)

039 (continued)

- Select “System Verification”
- Select “Base System”

Does processor node pass all diagnostics?

Yes **No**

040

– Repair problem as indicated by diagnostics. Use “MAP 0130: Processor Node” on page 1-30 as necessary.

041

Problem resolved.

– Go to “MAP 0570: End of Call” on page 1-357.

042

Yellow or green LED on processor node is not functioning.

– Have the customer remove the processor node from the active system configuration and power off the processor node.
– Put the circuit breaker at the front of the processor node in the Off (‘0’) position.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, ignoring PASS/FAIL results.
– Check yellow and green LEDs at front and rear of processor to see if each LED lights at some point.

Does each of the four LEDs light at any time?

Yes **No**

043

– Place processor node in service position.
– Repeat "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Check to see if same color LED is always Off in front and rear.

Are LEDs of same color always Off in rear?

Yes **No**

044

– Replace LED display card.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Do both LEDs light at any time?

Yes **No**

045

– Go to Step 047 on page 1-119.

046

Problem resolved.

– Go to Step 048 on page 1-119.

047

– Replace the node supervisor card.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to verify replacement.
– Go to Step 048.

048

All LEDs are operating.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Go to “MAP 0570: End of Call” on page 1-357.

MAP 0240: Wide Processor Node dc Short/Open

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

001

Problem in processor node power distribution detected by checking resistances of +4 V dc, +5 V dc, +12 V dc, and/or -12 V dc to ground.

– Based on the message, use the information in the table below to disconnect the appropriate cable and check resistance between the cable pins.

Voltage	Cable	From (positive lead)	To GND (negative lead)	Acceptable Range (in ohms)
+4 V	N00-PC-P16A	Pin 4	Pin 10	6 - 25
+5 VM	N00-PC-P13A	Pin 4	Pin 10	1K - 5M
+5 VI	N00-PC-P40A N00-PC-P45 N00-PC-P65	Pin 10 Pin 4 Pin 4	Pin 1 Pin 3 Pin 3	10 - 30 100 - 500* 100 - 500*
+12 V	N00-PC-P40A N00-PC-P45 N00-PC-P65	Pin 6 Pin 1 Pin 1	Pin 1 Pin 2 Pin 2	800 - 100K 1K - 5K* 1K - 5K*
–12 V	N00-PC-P40A	Pin 3	Pin 1	1K - 20K*
Note: *Resistance range assumes DASD(s) attached on this cable. With no DASD(s) attached, an open will be measured.				

– The following table shows cable connections:

Connector	Component
N00-PC-P16A N00-PC-P13A	CPU planar
N00-PC-P40A	I/O planar
N00-PC-P45 N00-PC-P65	DASD 3 / DASD 4 DASD 1 / DASD 2

Was resistance below acceptable range?

Yes **No**

002

Measured resistance is too high.

– Check for one or more of the following conditions:

- Open in power cable.
- Open in voltage distribution caused by a shorted component. Refer to list in Step 001 for suspect component(s).

– Remove the suspect component(s) and inspect for damage. Also check the following list for other suspect parts:

- Micro Channel adapter cards

(Step **002** continues)

002 (continued)

- Memory cards

– Replace any damaged components found during inspection.
– Recheck resistance per Step 001 on page 1-120.

Is resistance in the acceptable range?

Yes **No**

003

– Replace the appropriate component from second table in Step 001 on page 1-120.
– Go to Step 021 on page 1-123 to verify fix.

004

Problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

005

Measured resistance is too low.
– Use the following table to continue service based on the cable connector where the short was detected:

Connector	Component	Action
N00-PC-P16A N00-PC-P13A	CPU planar	Go to Step 006.
N00-PC-P40A	I/O planar	Go to Step 009.
N00-PC-P45 N00-PC-P65	DASD 3 / DASD 4 DASD 1 / DASD 2	Go to Step 018 on page 1-123.

006

Problem involves the CPU planar.
– Clip multimeter leads to the connector pins for the voltage that shows resistance out of range.
– Remove memory cards one-at-a-time until all components have been removed or resistance enters acceptable range.

Did removing memory cards make the short disappear?

Yes **No**

007

– Replace the CPU planar.
– Go to Step 021 on page 1-123 to verify fix.

008

Problem was in memory card(s).
– Replace the memory card which is causing a short.
– Go to Step 021 on page 1-123 to verify fix.

009

(Step **009** continues)

009 (continued)
Problem involves I/O planar.
Are there any Micro Channel slots empty?
Yes **No**

010

Micro Channel specifications may be exceeded by card requirements.
Has customer recently added or exchanged Micro Channel adapters?
Yes **No**

011

– Go to Step 015.

012

– Remove the most recent adapter(s) from this processor node.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Power on processor node from control workstation.
Does this fix the problem?
Yes **No**

013

Problem still exists.
– Go to Step 015.

014

This adapter was causing problem.
– Call next level of support.

015

– If necessary, place processor node in service position.
– Clip multimeter leads to the connector pins for the voltage that shows resistance out of range.
– Remove Micro Channel adapter(s) one-at-a-time until all adapters have been removed or resistance enters acceptable range.
Did removing the Micro Channel adapter(s) make the short disappear?
Yes **No**

016

– Replace the I/O planar.
– Go to Step 021 on page 1-123 to verify fix.

017

Problem was in Micro Channel adapter(s).
– Replace the adapter that was causing the short condition.
– Go to Step 021 on page 1-123 to verify fix.

018

(Step **018** continues)

018 (continued)
Problem involves DASD(s).
– Clip multimeter leads to the connector pins for the voltage that shows resistance out of range.
– Unplug the DASD one-at-a-time until both DASD have been removed or resistance enters acceptable range.

Did removing the DASD(s) make the short disappear?

Yes **No**

019

– Replace this DASD power cable: N00-PC-P45 or N00-PC-P65.
– Go to Step 021 to verify fix.

020

– Replace the DASD that is causing the short condition.
– Go to Step 021 to verify fix.

021

Part was replaced.
– Recheck resistance per Step 001 on page 1-120.

Is resistance in the acceptable range?

Yes **No**

022

Problem not resolved.
– Call next level of support.

023

Problem resolved.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breaker at front of processor node in the On (‘1’) position.
– Go to “MAP 0570: End of Call” on page 1-357.

MAP 0250: 604 or 604e High Node Environment

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

001

Are any messages displayed?

Yes **No**

002

– Go to Step 010 on page 1-125.

003

TTY message indicates “rc.powerfail” or **errpt -a | pg** displays “Loss of Electric Power” associated with processor node.

– Check 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.
– Refer to "Power/Keylock Status Register (PKSR)" in *RS/6000 SP: Maintenance Information, Volume 3* to decode power register bits.

Does message indicate loss of power or power off?

Yes **No**

004

Is the message a warning?

Yes **No**

005

– Go to Step 010 on page 1-125.

006

Message is a warning only.

Does this same message occur on more than one processor node?

Yes **No**

007

No immediate service required.

– Maintenance can be done now by returning to Step 003, and treating the message as a “Shutdown” or “Failure” message, or service can be deferred until a later date.

008

– Notify next level of support.

009

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 the following table to continue service:

Condition	Action
Any power loss message	Go to Step 010.
"...cooling problem..." or fan problem	Go to Step 034 on page 1-128.
"...memory protect..."	Go to Step 038 on page 1-129.

010

Power problem condition exists.
– Check the node supervisor green LED 1.
Is the node supervisor green LED 1 On?
Yes **No**

011

– Go to "MAP 0260: 604 or 604e High Node Power" on page 1-130.

012

– Check the green LED for the node power supplies.
Is the power supplies green LED Off?
Yes **No**

013

– Check for airflow blockage and/or fan or cooling problems with the node.
Do any of these problems exist?
Yes **No**

014

– Verify that you have the correct processor node. Then go to "MAP 0130: Processor Node" on page 1-30.

015

– Go to Step 034 on page 1-128.

016

– Go to Step 017

017

– Go to the appropriate removal and replacement procedure in "Power Supply and Cooling Units" in *RS/6000 SP: Maintenance Information, Volume 3* depending on:

- If node N+1 power is present
- If node N+1 power is not present (place the high node in service position and replace the failing power supply/cooling unit).

(Step **017** continues)

017 (continued)
Is the power supplies green LED Off?
Yes **No**

018

– Go to Step 033 on page 1-128.

019

– Check for 48 volts present at the high node power supply cable end(s) P1 and P2 (if N_1 power is present), at the rear of node. Measure voltage between any one of: pin 1, pin 2, or pin 3 and any one of: pin 7, pin 8, or pin 9.

Is the 48 volts missing?
Yes **No**

020

– Problem with 48 volts sensing.
– Go to Step 022.

021

– Go to Step 026 on page 1-127.

022

Problem with 48 volts sensing.
– From the control workstation, power off the processor node.
– Place the processor node in the service position.
–

Use the following prioritized table to continue service:

Priority	Component	Action
1	Node supervisor card	1. Replace card 2. Go to Step 023 on page 1-127
2	SIB card	1. Replace card 2. Go to Step 023 on page 1-127
3	IOD card	1. Replace card 2. Go to Step 023 on page 1-127
4	Lateral planar 1 card	1. Replace card 2. Go to Step 023 on page 1-127
5	Media module/operator panel cable	1. Replace cable 2. Go to Step 023 on page 1-127
6	CPU planar	1. Replace planar 2. Go to Step 023 on page 1-127
7	I/O planar	1. Replace planar 2. Go to Step 023 on page 1-127
8	All replaced	Call next level of support.

023

– Remove processor node from service position.
– From the control workstation, power on the processor node.

Is the power supplies green LED off?

Yes **No**

024

Go to Step 033 on page 1-128.

025

Go to Step 022 on page 1-126 and replace the next highest priority component.

026

Problem with 48 volts supplied to power supply.

– If node N+1 power is present, notify the customer that the 604 or 604e high node must be powered off before continuing.
– If node N+1 power is not present, continue.
– Place the 604 or 604e high node into service position. Replace the high node power supply cable. Refer to "Replacing the 604 or 604e High Node Power Supply Cable (at CBJ2)" at *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Replace the 604 or 604e high node from the service position.

Is the power supplies green LED Off?

Yes **No**

027

– Go to Step 033 on page 1-128.

028

– Place the 604 or 604e high node in service position, and replace the high node circuit breaker corresponding to the power supply. Refer to "Replacing the 604 or 604e High Node Circuit Breaker" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Replace the 604 or 604e high node from the service position.

Is the power supplies green LED Off?

Yes **No**

029

– Go to Step 033 on page 1-128.

030

– Place the 604 or 604e high node in service position, and replace the high node power cable. Refer to "Replacing the 604 or 604e High Node Power Cable (at CBJ1)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Replace the 604 or 604e high node from the service position.

(Step **030** continues)

030 (continued)
Is the power supplies green LED Off?
Yes **No**

031

– Go to Step 033.

032

– Go to “MAP 0430: dc Power Loss from Bulk dc Power Supply(s)” on page 1-250

033

– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breakers at front of processor node in On (‘1’) position.
– Go to “MAP 0570: End of Call” on page 1-357.

034

“...cooling problem...” or fan problem condition exists.
– Place processor node in service position.
– Use the following table to reseat or replace components:

Priority	Component	Action
1	Fan 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 **Note:** See Figure 1-11 on page 1-44.	1. Check specified fan for blockage or loose cable connection. Refer to "Power/Keylock Status Register (PKSR)" in *RS/6000 SP: Maintenance Information, Volume 3* to decode power register bits. 2. Fix any obvious problem(s). If none are found, continue at Priority 2. 3. Continue at Step 035 on page 1-129.
2	Fan 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 **Note:** See Figure 1-11 on page 1-44.	1. Replace fan and/or cooling module as described in "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. Refer to "Power/Keylock Status Register (PKSR)" in *RS/6000 SP: Maintenance Information, Volume 3* to decode power register bits. 2. Fix any obvious problem(s). 3. Continue at Step 035 on page 1-129.
3	Lateral planar 1 card	1. Replace card. 2. Continue at Step 035 on page 1-129.
4	SIB card	1. Replace card. 2. Continue at Step 035 on page 1-129.
5	Lateral planar 2 card	1. Replace card. 2. Continue at Step 035 on page 1-129.
6	Fan cable	1. Replace cable. 2. Continue at Step 035 on page 1-129.
7	All replaced	Call next level of support.

035

Component replaced or reseated.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breakers at the front of processor node in the On (‘1’) position.
– Check error log or SRN.

Does the problem still exist?

Yes **No**

036

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

037

– Put circuit breakers at the front of the processor node in the Off (‘0’) position.
– Reinstall the previously removed component.
– Go to Step 034 on page 1-128 to service next highest priority component.

038

Memory protection error: “memoryProtect”

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

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

Yes **No**

039

Problem may be: base memory card, CPU card, I/O planar, or node supervisor control cable.
– Replace parts, one at a time, until problem is corrected.

Are you able to correct the problem?

Yes **No**

040

Call next level of support.

041

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

042

– Check memory card and SIMM part numbers in *Diagnostic Information for Micro Channel Bus Systems* (SA38-0532) and *Adapters, Devices and Cable Information* (SA38-0533) to ensure that they are compatible with the fastest Type 7013 machines.
– If necessary, call next level of support.

MAP 0260: 604 or 604e High Node Power

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

001

– Check the node supervisor card green LED 1.

Is the green LED 1 Off?

Yes **No**

002

Processor node getting 48 V dc power.

Is the green LED 1 flashing?

Yes **No**

003

Green LED 1 is On, indicating no problem with power supply.

– Verify that you have the proper processor node, then go to “MAP 0130: Processor Node” on page 1-30.

004

Processor node is getting power.

– Power on RS/6000 logic from the virtual front panel on the control workstation.

Does green LED 1 light and stay lit?

Yes **No**

005

– Check the node front panel cover to ensure that it is installed properly, depressing the interlock switch (white button).

Is front panel installed properly?

Yes **No**

006

– Fix front panel.

– Go to “MAP 0570: End of Call” on page 1-357.

007

– Go to “MAP 0280: 604 or 604e High Node Minimum Configuration” on page 1-145.

008

RS/6000 logic getting power.

Does processor node IPL successfully?

Yes **No**

009

Processor node has problem with IPL.

(Step **009** continues)

009 (continued)
– Go to “MAP 0130: Processor Node” on page 1-30.

010

No problem detected.
– Record reason for power-off condition.
– Go to “MAP 0570: End of Call” on page 1-357.

011

Check the node supervisor card yellow LED 5.
Is the yellow LED 5 Off?
Yes **No**

012

Base code loaded on node supervisor card.
– Go to "Updating the Node Supervisor Code" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 022 on page 1-132.

013

– Check the SIB green LED at the rear of the processor node.
Is the SIB green LED Off?
Yes **No**

014

– Go to MAP 0250: 604 or 604e High Node Environment Step 012 on page 1-125.

015

– Check circuit breakers at front of processor node. Put these circuit breakers in the On (‘1’) position if they are not already.
Do the circuit breakers go (trip) to the Off (‘0’) position?
Yes **No**

016

– Go to Step 022 on page 1-132.

017

– Place processor node in service position.
– Check power harnesses at power supplies in the rear of the node, at the connection to the circuit breakers, and at the 48-volt bulk power connections for any obvious problems which might cause a short.
Does everything appear to be okay?
Yes **No**

018

– Fix obvious problem(s). If necessary, replace node power harness.
– Remove processor node from service position.
(Step **018** continues)

018 (continued)
– Reconnect all cables at rear of the processor node.
– Go to Step 015 on page 1-131.

019

– Using a multimeter, check for a short between any pins in power supplies unit plug.

Was a shorted condition detected?

Yes **No**

020

– Using a multimeter, check for a short between any pins in node power plug(s).
– Using a multimeter, check for a short between any tabs in circuit breaker(s).
– If a short is detected, isolate it to either the cable or circuit breaker and replace the corresponding part.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Go to Step 015 on page 1-131.

021

– Replace corresponding power supply.
– Remove processor node from service position.
– Reconnect all cables at rear of processor node.
– Go to Step 015 on page 1-131.

022

– From control workstation or processor node, check green LED 1 for this node.

Is green LED 1 off or is 'No Power to Node' displayed on the control workstation?

Yes **No**

023

Processor node problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

024

– Check processor node(s) on any other dc power harness for any that are powered on. Ensure that the other processor node has its circuit breaker in the On ('1') position.
– Check the green LED 1 for an On or Flashing condition.
– High processor nodes receive 48-volt power by connecting to four power plugs, possibly connecting to two of the four power harnesses. The sets of processor nodes are as follows:

```
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
```

(Step **024** continues)

024 (continued)

Is the green LED 1 on any other processor node On or Flashing?

Yes **No**

No → **025**

– Go to "MAP 0370: Main Power" on page 1-222.

Yes → **026**

– Check all other processor nodes on the same dc power harness as the failing processor node to check for the same symptom - circuit breaker on but green LED 1 not lit.

Is this the only processor node showing this symptom?

Yes **No**

No → **027**

Problem with 48 V dc power distribution.

– Go to "MAP 0480: Open in 48 V dc Distribution" on page 1-283.

Yes → **028**

– Check the cable connections at the power supplies, at the circuit breaker(s) behind CB panel below high node (and at the four 48-volt power distribution connection).

Are there a good connection?

Yes **No**

No → **029**

– Fix cable connection problem.

– Go to Step 022 on page 1-132.

Yes → **030**

– Put circuit breakers CB01 and CB02 in the "on" (1) position.

– Check for 48 volts present at the high node power supply cable end(s) P1 and P2 (if N+1 power is present) in the rear of the node. Measure the voltage between either pin 1, pin 2, or pin 3 and either pin 7, pin 8, or pin 9.

Is there 48 volts present at both P1 and P2?

Yes **No**

No → **031**

Is 48 volts missing from both P1 and P2?

Yes **No**

No → **032**

– Go to Step 037 on page 1-134.

Yes → **033**

Voltage is not present at both P1 and P2.

– Go to "MAP 0480: Open in 48 V dc Distribution" on page 1-283.

034

(Step **034** continues)

034 (continued)
48 volts distribution is getting to node.
– Check power supply/cooling unit green LEDs and running fans.
Are the power supply/cooling green LEDs On and are fans running?
Yes **No**

035

– Go to MAP 0250: 604 or 604e High Node Environment Step 017 on page 1-125.

036

– Go to Step 001 on page 1-130.

037

48 volts missing at either P1 or P2.
– If P1: replace CB01.
– If P2: replace CB02.
Is voltage still missing at either P1 or P2?
Yes **No**

038

– Go to "MAP 0570: End of Call" on page 1-357.

039

– Replace high node power supply cable.
Is voltage still missing at either P1 or P2?
Yes **No**

040

– Go to "MAP 0570: End of Call" on page 1-357.

041

– Go to "MAP 0480: Open in 48 V dc Distribution" on page 1-283.

MAP 0270: 604 or 604e High Node Control

Attention: If a 604 or 604e high node is present in this frame, it is possible that the 48 Volt power distribution is spread across more than one power harness. Check physical connections from circuit breaker(s) to 48 V 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 High Performance Switch (HiPS) feature or Scalable POWERparallel Switch (SPS) 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.

Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

Refer to "Viewing Switch Partitions" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for locating and fencing/unfencing nodes within a switch partition.

001

Processor node problem detected by customer or CE.
– Use the following table to continue service:

Condition	Action
• Problem with node power	Go to “MAP 0250: 604 or 604e High Node Environment” on page 1-124.
• 3-digit LEDs displayed but missing segments or remain blank	Go to Step 040 on page 1-142.
• Node will not reset • Mode switch problem—problem setting NORMAL, SECURE, or SERVICE.	Go to Step 002.
• No response from TTY console	• Close existing TTY window and open another. • Go to Step 026 on page 1-139.
• Yellow or green LEDs on node will not light.	Go to Step 046 on page 1-143.

002

Node will not reset or mode switch problem.
– Check with customer to make sure this processor node is not in the current active configuration. If processor node is *not* operational and actively working at this time, continue service. If it *is* operational and actively working, schedule a time convenient for the customer.
– From the control workstation, open the node front panel display.
– Make note of the mode switch position for this processor node.
– Set mode switch to something other than that recorded above.
– If not already there, set the mode switch to SERVICE.
(Step **002** continues)

002 (continued)

Note: Do NOT recycle node power until reset fault is verified

.

Does the mode switch fail to toggle?

Yes **No**

003

Problem not related to mode switch.

Was mode originally in SERVICE position as noted in previous step?

Yes **No**

004

Customer may have tried to reset processor node in SECURE mode. Reset will only take effect in NORMAL or SERVICE modes.

– From the control workstation, reset this processor node.

Does processor node reset?

Yes **No**

005

Problem with reset.

– Go to Step 012 on page 1-137.

006

No problem found.

– Inform customer that the processor node will not reset if the mode switch is in the SECURE position.

– Go to “MAP 0570: End of Call” on page 1-357.

007

– From the control workstation, issue reset for this processor node.

Does processor node reset?

Yes **No**

008

Problem with reset.

– Go to Step 012 on page 1-137.

009

Intermittent problem may be occurring.

– Please record following:

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

– Check logs to see if this fault has been previously recorded.

(Step **009** continues)

009 (continued)
Is this a recurring fault?
Yes **No**

010

This is not a recurring fault.
– Go to "MAP 0570: End of Call" on page 1-357.

011

Reoccurrence of intermittent fault has been detected.
– Treat this fault as a solid failure.
– Go to Step 024 on page 1-138.

012

– From the control workstation node front panel display:

- Shutdown and power-off processor node.
- Power-on processor node.
- Check 3-digit LEDs for LED sequence indicating IPL.

Do the 3-digit LEDs change?
Yes **No**

013

Node supervisor card not responding to commands.
– Go to "MAP 0110: Supervisor Subsystem" on page 1-10.

014

Processor node is IPLing.
Do 3-digit LEDs eventually indicate completion of IPL sequence (i.e. blank or "uuu")?
Yes **No**

015

Processor node has problem IPLing.
Do 3-digit LEDs stop at constant 200?
Yes **No**

016

– Go to Step 008 on page 1-88 to continue service.

017

Problem with SECURE signal.
– Go to Step 024 on page 1-138 to continue service.

018

– From node front panel display, click on "TTY" button to open a TTY console.
– From the TTY console:

(Step **018** continues)

018 (continued)

- Select “Advanced Diagnostic Routines”
- Select “System Verification”
- Select “Base System”.

– Follow directions for the “Key Mode Switch Test”, setting the mode switch from the processor node‘s front panel on the control workstation.

Does this test indicate a failure?

Yes **No**

019

– From the control workstation, reset this processor node.

Does processor node reset?

Yes **No**

020

Problem with reset.

– Go to Step 024 to continue isolation.

021

Node reset and mode switches functioning properly.

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

Yes **No**

022

This is an intermittent problem.

– Please record following tracking information:

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

– Go to “MAP 0570: End of Call” on page 1-357.

023

Problem resolved.

– Go to “MAP 0570: End of Call” on page 1-357.

024

Problem with reset or mode switch function.

– From the control workstation, power off processor node.

– Place processor node in service position.

– Use the following prioritized table to continue service:

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 025 on page 1-139 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 025 on page 1-139 to verify fix.
3	Cable between node supervisor and S1	1. Replace card. 2. Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 3. Go to Step 025 on page 1-139 to verify fix.
4	I/O Planar Board	1. Replace board. 2. Go to Step 025 on page 1-139 to verify fix.
5	All replaced	Call next level of support.

025

Component has been repaired or replaced.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put the circuit breaker at the front of the processor node in the On (‘1’) position.
– Go to Step 014 on page 1-137 to continue service.

026

No response from TTY console for a processor node.
– Make sure processor node was IPLed in NORMAL mode.
–

From system file server, telnet into this processor node:

telnet *nodename*

– Log in as “root”.
– Have the customer check to make sure that the TTY port on the processor node is correctly defined.

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

   smit console

   Use the menu options to check and/or 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.
2. Check the TTY configuration by issuing the following command in the processor node's window:

   smit tty

   Use the menu options to check and/or reconfigure the “s1” TTY port as required. The proper TTY parameters are listed in *IBM RS/6000 SP: Administration Guide*.

(Step **026** continues)

026 (continued)
Is the TTY port defined properly, and the console setup to use the TTY port?
Yes **No**

027

TTY not responding due to customer configuration.
– Customer must configure these parameters.
– Go to "MAP 0570: End of Call" on page 1-357.

028

Problem due to hardware.
– Close console TTY window (if already open).
– Log into the node over the Ethernet:

telnet *nodename*

– Enter the following command:

chcons /dev/tty1
– Use **diag** command to run regular (not advanced) diagnostics on "TTY0".
Do the diagnostics pass (no problem found)?
Yes **No**

029

– Run wrap diagnostics on S1 to node supervisor cable.
Do diagnostics fail?
Yes **No**

030

– Go to Step 034.

031

– Run wrap diagnostics on S1.
Do diagnostics pass (no trouble found)?
Yes **No**

032

– Replace I/O planar board.
– Go to Step 035 on page 1-141.

033

– Go to Step 034.

034

– Log into the node over the Ethernet:

telnet *nodename*

– Enter the following command:

chcons /dev/tty0
(Step **034** continues)

034 (continued)
– From the control workstation, make sure the node front panel display is open.
– Close TTY console at this time.
– Have the customer remove the processor node from the active system configuration and power off the processor node.
– Put the circuit breaker at the front of the processor node in the Off (‘0’) position.
– Place processor node in service position.
– Refer to the following table for priority of replacement or repair of components.

Priority	Component	Action
1	Cable between node supervisor and S1	1. Replace cable. 2. Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 3. Go to Step 035 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 035 to verify fix.
3	SIB card	1. Replace card. 2. Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 3. Go to Step 035 to verify fix.
4	Lateral planar 1 card	1. Replace card. 2. Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 3. Go to Step 035 to verify fix.
5	IOD card	1. Replace card. 2. Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 3. Go to Step 035 to verify fix.
6	Cables between frame supervisor and node supervisor card	1. Replace cable. 2. Go to Step 035 to verify fix.
7	All replaced	Call next level of support.

035

Component has been repaired or replaced.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– As processor node completes IPL, check the TTY console window.
– From the control workstation node front panel display, put the processor node in SERVICE mode.
– Put the circuit breaker at the front of the processor node in the On (‘1’) position.
(Step **035** continues)

035 (continued)
Do you get any data on the TTY console screen?
Yes **No**

036

– Go to Step 034 on page 1-140 to service next highest priority component.

037

Processor node IPLed in SERVICE mode.
– From the TTY console:

- Select “Advanced Diagnostic Routines”
- Select “System Verification”
- Select “Base System”

Does processor node pass all diagnostics?
Yes **No**

038

– Repair problem as indicated by diagnostics. Use “MAP 0130: Processor Node” on page 1-30 as necessary.

039

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

040

3-digit LED problem.
– Have the customer remove the processor node from the active system configuration and power off the processor node.
– Put the circuit breaker at the front of the processor node in the Off (‘0’) position.
– Place processor node in service position.
– Refer to the following table for priority of replacement or repair of components.

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 041 on page 1-143 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 041 on page 1-143 to verify fix.
3	Cable between node supervisor and S1	1. Replace card. 2. Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 3. Go to Step 041 on page 1-143 to verify fix.
4	I/O Planar Board	1. Replace board. 2. Go to Step 041 on page 1-143 to verify fix.
5	All Replaced	Call next level of support.

041

Component has been repaired or replaced.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– From the control workstation, power on this processor node.
– From the control workstation, make sure the 3-digit LEDs for this processor node are displayed on the screen.
– Check the 3-digit LEDs for the IPL sequence.

Do the 3-digit LEDs indicate the IPL sequence?

Yes **No**

042

– Go to Step 040 on page 1-142 to service next highest priority component.

043

– From the TTY console:

- Select “Advanced Diagnostic Routines”
- Select “System Verification”
- Select “Base System”

Does processor node pass all diagnostics?

Yes **No**

044

– Repair problem as indicated by diagnostics. Use “MAP 0130: Processor Node” on page 1-30 as necessary.

045

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

046

Yellow or green LED on node supervisor is not functioning.
– Have the customer remove the processor node from the active system configuration and power off the processor node.
– Put the circuit breakers at the front of the processor node in the Off (‘0’) position.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, ignoring PASS/FAIL results.
– Check yellow and green LEDs on the node supervisor card to see if each LED lights at some point.

Does each of the eight LEDs light at any time?

Yes **No**

047

– Place processor node in service position.
– Repeat "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Check to see if same color LED is always Off in front and rear.

(Step **047** continues)

047 (continued)
Are LEDs of same color always Off in rear?
Yes **No**

048

– Replace LED display card.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
Do both LEDs light at any time?
Yes **No**

049

– Go to Step 051.

050

Problem resolved.
– Go to Step 052.

051

– Replace the node supervisor card.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to verify replacement.
– Go to Step 052.

052

All LEDs are operating.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Go to “MAP 0570: End of Call” on page 1-357.

MAP 0280: 604 or 604e High Node Minimum Configuration

Attention: After the lateral planar 2 card is installed and the system is powered-up, the system ID is downloaded to the lateral planar 2 card from a backup source within the system. This ID becomes permanent on the lateral planar 2 and cannot be altered without special tools, Therefore, the lateral planar 2 cannot be transferred to another system. It must be returned to the plant of manufacture as a new defective part.

Attention: Lateral planar 2 and SIB EEPROMs contain the SYSID of the system. When one of the two components is to be replaced (for example the lateral planar 2), the SYSID information is copied from SIB EEPROM into the lateral planar 2 EEPROM when you start the system.

To avoid losing this information, it is not possible to replace both components at the same time. When both components are to be replaced, proceed as follows:

1. First substitute the SIB and start up the system: the SYSID information is copied from lateral planar 2 EEPROM to the SIB EEPROM.
2. Substitute the lateral planar 2 and start up the system: the SYSID information is copied from SIB EEPROM to the lateral planar 2 EEPROM.

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.

Notes:

1. The Graphical User Interface (GUI) Node Front Panel Layout may not release the serial port. It is necessary to issue:

   s1term -Gw *Frame# Node#* to take the serial port from the GUI and display the BUMP prompt and gain access to BUMP functions.
2. Ensure that all node 3-digit display summaries are up for the frame in which the node being serviced is located. This is the only reliable way to monitor for codes referenced in this MAP.
3. Install the memory cards in a right-to-left sequence beginning with slot A, and then continuing with slots B, C, and D. Memory cards must be installed with no empty slots between installed memory cards.
4. Install the CPU cards in a right-to-left sequence beginning with slot P, and then continuing with slots Q, R, and S. CPU cards must be installed with no empty slots between installed CPU cards.

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

The MAP steps instruct you to reduce the system to one or more of the following configurations:

Minimum Configurations for 604 and 604e High Nodes:

- Power distribution cable cluster, system planar (SP), I/O planars, I/O card (IOD), CPU module flex cables, I/O module flex cables, system interface board (SIB), one CPU card (CPU), one memory card (MC), power supply (PS), lateral planar 1 card, lateral planar 2 card, and node supervisor assembly.

  If no failure is detected, the maintenance menu is displayed. Any other response means one of the remaining FRUs is failing.
- Power distribution cable cluster, system planar (SP), I/O planars, I/O card (IOD), CPU module flex cables, I/O module flex cables, system interface board (SIB), one CPU card (CPU) and one memory card (MC), power supply (PS), SCSI adapter, lateral planar 1 card, lateral planar 2 card, and node supervisor assembly.

  If no failure is detected, the Diagnostic Operating Instructions frame is displayed when the diagnostics are loaded, and the system console is selected. Any other response means one of the remaining FRUs is failing.

001

– Sometimes an SRN or BUMP Error Code will be logged in the BUMP Error Log. Before proceeding, check the BUMP Error Log for any SRNs or Error Codes. (See "Using the 604 or 604e High Node BUMP Menus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for BUMP menu descriptions.) This is done as follows:

1. Power off
2. From the GUI Node Front Panel Layout, set the physical key to the service position.
3. Press Enter at the TTY console.
4. Type **sbb**
5. Press Enter
6. Select “Set Flags” (1)
7. Enable the BUMP Console Present Flag, disable the Autoservice IPL flag.
8. To exit, type **x** twice.
9. Power on
10. When the Maintenance Menu appears, display the BUMP Error Log. (Scan all pages.)
11. If an SRN is logged, record it and any location codes. Location Codes are separated by a blank. Perform the listed action. An SRN will be preceded by ‘888 103’.
12. If no SRN is logged, check for an Error Code. If an Error Code is logged, record it and any location code. Location codes are separated by a blank. Perform the listed action. Look up the Error Code for possible FRUs. See *RS/6000 SP: Maintenance Information, Volume 3*.
13. Perform the following:

– Ensure that the diagnostics and the operating system are shut down. At the Maintenance Menu, select 5 and then hit ENTER.
– Ensure that the key position switch is in the Service Position.
– Set the circuit breakers to the On (‘1’) position.
– Ensure power supply cable(s) are connected to power supplies.
– Perform service diagnostics from either hdisk0 or network boot.
– Find the symptom in the following table that best matches the symptom on your system, and then perform the associated task.

Note: Before verifying any condition indicated in the following steps of this MAP (e.g., a certain code displayed on the operator panel display), be sure that the system activity has stopped on that condition (same condition for more than 3 minutes).

Information in Operator Panel Display	Other Conditions	Action
Blank	Diagnostic Operating Screen is displayed.	Go to Step 032 on page 1-153
Blank	Maintenance Menu is displayed.	Select System Boot, then Boot From List (disk or network boot). Wait for one of the other symptoms in this table to occur or if the Diagnostics do not load, go to Step 002 on page 1-147
888 flashing		Go to Step 002 on page 1-147
260	Main Menu is Displayed	Select Exit Main Menu and Start System (Boot) then press Enter. When the Starting System Boot menu displays, press Enter. **Note:** Repeat this procedure each time these conditions occur.
269 flashing		Go to Step 059 on page 1-158
269 (not flashing)		Go to Step 056 on page 1-157
c31	Instructions to select the system console are displayed on the screen.	Follow the instructions on the screen. Wait for one of the other symptoms in this table to occur.
325 or less	Digits are on solid for more than 3 minutes, except for '165' which may display up to ten minutes with no activity on the BUMP console, and the Power light is on.	Go to Step 002 on page 1-147
326 or greater	Digits are on solid for more than 3 minutes, and the power light is on.	Go to Step 019 on page 1-151
Any symptom not listed above.		Go to Step 002 on page 1-147

002

– Set the circuit breakers to the Off ('0') position.
– Record the slot numbers of the adapters. Label and record the location of any cables attached to the adapters. Remove all the MCA adapters.
– Record the slot numbers of the memory cards (MC), and then remove all the memory cards (MC), except the one in slot A.
– Record the slot numbers of the CPU cards (CPU) and then remove all the CPU cards (CPU), except the one in slot P.
– Set the circuit breakers to the On ('1') position.
– Wait for one of the following conditions to occur:

  - The Maintenance Menu is displayed.
  - The same three digit number is displayed in the operator panel display for longer than three minutes except for the number '165' which may display to ten minutes with no activity on the BUMP console.
  - The number '888' or '---' is in the operator panel display.

(Step **002** continues)

002 (continued)
Is the maintenance menu displayed?
Yes **No**

003

One of the FRUs remaining in the CPU Enclosure is defective.
– To test each FRU, exchange the FRUs that have not already been exchanged in the following order:

1. I/O card (IOD)
2. CPU card (CPU)
3. Memory card (MC)
4. System planar (SP)
5. I/O planars
6. Power supply (PS)
7. CPU module flex cables
8. I/O module flex cables
9. System interface board (SIB)

   Note: Once this part is used, return to plant as a “new defective, broken seal”.

10. Lateral planar 1 card
11. Lateral planar 2 card

    Note: Once this part is used, return to plant as a “new defective, broken seal”.

12. Node supervisor card/supervisor interposer card
13. Media power cable.

The system is working correctly if the maintenance menu is displayed. If this occurs, the last part you exchanged is defective.
– Set the circuit breakers to the Off (‘0’) position.
– Exchange one of the FRUs in the list.
– Set the circuit breakers to the On (‘1’) position.
Is the maintenance menu displayed?
Yes **No**

004

– Repeat Step 003 until the defective FRU is identified or all the FRUs have been exchanged.
Did the symptom change?
Yes **No**

005

– Call the next level of support.

006

– Check for loose cards, cables, and obvious problems. If you do not find a problem, return to Step 001 on page 1-146 and follow the instructions for the new symptom.

007

The last FRU you exchanged is the defective one.
– Reinstall all the FRUs you have exchanged, except the last one and power on the system.
(Step **007** continues)

007 (continued)
– Go to "MAP 0570: End of Call" on page 1-357.

008

No failure was detected with this configuration.
– Set the circuit breakers to the Off ('0') position.
– Starting with the CPU cards, install one additional CPU card (CPU) or memory card (MC) (if any).
– Set the circuit breakers to the On ('1') position.
– Wait for one of the following conditions to occur:

- The Maintenance Menu is displayed.
- The same three digit number is displayed in the operator panel display for longer than three minutes except for the number '165' which may display for up to ten minutes with no activity on the BUMP console.
- The number '888' or '---' is in the operator panel display.

Is the maintenance menu displayed?
Yes **No**

009

– Go to Step 011.

010

– Repeat Step 008 until all CPU cards (CPU) and all memory cards (MC) are installed and tested.
– After all CPU cards (CPU) and all memory cards (MC) are installed and tested, set the circuit breakers to the Off ('0') position.
– Install the SCSI adapter.
– Connect the SCSI cable from the SCSI adapter to the SCSI connector.
– Go to Step 020 on page 1-151

011

The failure may be caused by the last CPU card (CPU) or memory card (MC) installed.
– Set the circuit breakers to the Off ('0') position.
– Exchange the last card installed (CPU or memory).
– Set the circuit breakers to the On ('1') position.
– Wait for one of the following conditions to occur:

- The Maintenance Menu is displayed.
- The same three digit number is displayed in the operator panel display for longer than three minutes except for the number '165' which may display for up to ten minutes with no activity on the BUMP console.
- The number '888' or '---' is in the operator panel display.

Is the maintenance menu displayed?
Yes **No**

012

– Go to Step 014 on page 1-150.

013

(Step **013** continues)

013 (continued)
– Go to "MAP 0570: End of Call" on page 1-357.

014

One of the FRUs remaining in the CPU Enclosure is defective.
– To test each FRU, exchange the FRUs in the following order:

1. System planar (SP)
2. I/O card (IOD)
3. CPU cards (CPU)
4. Memory cards (MC)
5. I/O planars
6. CPU module flex cables
7. I/O module flex cables
8. System interface board (SIB)

   Note: Once this part is used, return to plant as a "new defective, broken seal".

9. Node supervisor card assembly
10. Lateral planar 1 card
11. Lateral planar 2 card

    Note: Once this part is used, return to plant as a "new defective, broken seal".

– Set the circuit breakers to the Off ('0') position.
– Exchange one of the FRUs in the list.
– Set the circuit breakers to the On ('1') position.
– Wait for one of the following conditions to occur:

- The Maintenance Menu is displayed.
- The same three digit number is displayed in the operator panel display for longer than three minutes except for the number '165' which may display for up to ten minutes with no activity on the BUMP console.
- The number '888' or '---' is in the operator panel display.

Is the maintenance menu displayed?
Yes **No**

No

015

– Reinstall the original FRU.
– Repeat Step 014 until the defective FRU is identified or all the FRUs have been exchanged.
Did the symptom change?
Yes **No**

No

016

– Call the next level of support.

Yes

017

– Check for loose cards, cables, and obvious problems. If you do not find a problem, return to Step 001 on page 1-146 and follow the instructions for the new symptom.

018

(Step **018** continues)

018 (continued)
– Go to “MAP 0570: End of Call” on page 1-357.

019

– Set the circuit breakers to the Off (‘0’) position.
– Record the slot numbers of the adapters. Label and record the location of any cables attached to the adapters.
– Go to Step 020.

020

– **EITHER** leave in the SCSI adapter and remove all DASD except the boot disk **OR** leave in the Ethernet adapter for a net boot diag and remove the SCSI adapter. (See the media drawer diagram in "Removing the 604 or 604e High Node DASD" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.)
– Set the circuit breakers to the On (‘1’) position.
– If the Maintenance Menu is displayed, select System Boot, then Boot From List.
– Wait for one of the following conditions to occur:

- The system stops with a flashing or solid ‘269’ displayed in the operator panel display.
- The system stops with ‘c31’ displayed in the operator panel display.
- The same three digit number is displayed in the operator panel display for longer than three minutes except for the number ‘165’ which may display for up to ten minutes with no activity on the BUMP console.
- The number ‘888’ or ‘---’ is in the operator panel display.

Is ‘Diagnostic Operating Screen’ or ‘c31’ displayed in the operator panel display?
Yes **No**

021

One of the FRUs remaining in the CPU Enclosure is defective.
– In the following order, exchange the FRUs that have not been exchanged:

1. SCSI adapter
2. Hdisk0
3. SCSI cable
4. Disk 1, Disk 4 receiver card
5. Disk 2, Disk 3 receiver card
6. Inter-receiver cable
7. I/O card (IOD)
8. I/O planars
9. CPU module flex cables
10. I/O module flex cables
11. System planar (SP)
12. System interface board (SIB)
13. Power distribution cable cluster
14. CPU cards (CPU) (one at a time)
15. Memory cards (MC) (one at a time)
16. Power supply (PS)

– Repeat Step 019 until the defective FRU is identified or all the FRUs have been exchanged.
(Step **021** continues)

021 (continued)
Did the symptom change?
Yes **No**

022

– Call the next level of support.

023

– Check for loose cards, cables, and obvious problems. If you do not find a problem, return to Step 001 on page 1-146 and follow the instructions for the new symptom.

024

The system is working correctly with this configuration. One of the adapters that you removed is probably defective.
– Set the circuit breakers to the Off (‘0’) position.
– Install one adapter, and connect any cables and devices that were attached to it.
– Set the circuit breakers to the On (‘1’) position.
– Start the diag boot from hdisk0 or net boot.
– If the Maintenance Menu is displayed, select System Boot, then Boot From List.
– Wait for one of the following conditions to occur:

- The system stops with ‘c31’ displayed in the operator panel display.
- The system stops with a flashing or solid ‘269’ displayed in the operator panel display.
- The same three digit number is displayed in the operator panel display for longer than three minutes except for the number ‘165’ which may display for up to ten minutes with no activity on the BUMP console.
- The number ‘888’ or ‘---’ is in the operator panel display.

Is ‘Diagnostic Operating Screen’ or ‘c31’ displayed in the operator panel display?
Yes **No**

025

– Go to Step 027.

026

– Repeat Step 024 until all of the adapters are installed.
– Go to “MAP 0570: End of Call” on page 1-357.

027

– Set the circuit breakers to the Off (‘0’) position.
– Starting with the last installed adapter, disconnect one attached device and cable.
– Set the circuit breakers to the On (‘1’) position.
– If the Maintenance Menu is displayed, select System Boot, then Boot From List.
– Wait for one of the following conditions to occur:

- The system stops with ‘c31’ displayed in the operator panel display.
- The system stops with a flashing or solid ‘269’ displayed in the operator panel display.
- The same three digit number is displayed in the operator panel display for longer than three minutes except for the number ‘165’ which may display for up to ten minutes with no activity on the BUMP console.

(Step **027** continues)

027 (continued)

- The number '888' or '---' is in the operator panel display.

Is 'Diagnostic Operating Screen' or 'c31' displayed in the operator panel display?

Yes **No**

028

– Repeat Step 019 on page 1-151 until the defective device is identified or all the devices and cables have been exchanged.
– If all the devices and cables have been removed then, one of the FRUs remaining in the CPU Enclosure is defective. To test each FRU, exchange the FRUs in the following order:

- Adapter (last one installed)
- I/O card (IOD)
- I/O planars
- CPU module flex cables
- I/O module flex cables
- System interface board (SIB)
- Power supply (PS)

Did the symptom change?

Yes **No**

029

– Call the next level of support.

030

– Check for loose cards, cables, and obvious problems. If you do not find a problem, return to Step 001 on page 1-146 and follow the instructions for the new symptom.

031

The last device or cable you disconnected is defective.
– Exchange the defective device or cable.
– Go to "MAP 0570: End of Call" on page 1-357.

032

– Set the circuit breakers to the Off ('0') position.
– Record the slot numbers of the adapters. Label and record the location of any cables attached to the adapters. Remove all the MCA adapters except the one that is attached to hdisk0 that you will IPL from and the one that your console is attached to.

Note: Leave serial adapter cable and supervisor adapter cable attached.

– Set the circuit breakers to the On ('1') position.
– Perform service diagnostics from either hdisk0 or network book.
– If the Maintenance Menu is displayed, select System Boot, then Boot From List.
– Wait for one of the following conditions to occur:

- The system stops with 'c31' displayed in the operator panel display.
- The system stops with a flashing or solid '269' displayed in the operator panel display.
- The same three digit number is displayed in the operator panel display for longer than three minutes except for the number '165' which may display for up to ten minutes with no activity on the BUMP console.

(Step **032** continues)

032 (continued)

- The number '888' or '---' is in the operator panel display.

Is 'Diagnostic Operating Screen' or 'c31' displayed in the operator panel display?

Yes **No**

033

The symptom has changed.

– Check for loose cards, cables, and obvious problems. If you do not find a problem, return to Step 001 on page 1-146 and follow the instructions for the new symptom.

034

– Follow the instructions on the display to select your console.
– When the Diagnostics Operating Instructions display, press the Enter key.
– If the terminal type has not been defined or you are IPLing from diag net boot, you must use the Initialize Terminal option on the FUNCTION SELECTION menu to initialize the AIX operating system environment before you can continue with the diagnostics. This is a separate and different operation than selecting the console display.
– Select Advanced Diagnostics Routines.
– When the DIAGNOSTIC MODE SELECTION menu displays, select System Verification.
– Run the diagnostics for each of the adapters and devices on the test list.

Did you get an SRN?

Yes **No**

035

One of the adapters or devices you removed is causing the problem.

– Install the adapters and devices one at a time to determine the failing adapter or device. Test the system after each adapter or device is installed.
– Go to "MAP 0570: End of Call" on page 1-357.

036

– Look at the FRU part numbers associated with the SRN.

Have you exchanged all the FRUs that correspond to the failing function codes?

Yes **No**

037

– Exchange the FRU with the highest failure percentage that has not been changed.
– Repeat Step 036 until all the FRUs associated with the SRN have been replaced or System Checkout runs with no trouble found. Run System Checkout after each FRU is exchanged.
– If System Checkout runs without error, go to "MAP 0570: End of Call" on page 1-357.

038

– Go to Step 002 on page 1-147.

039

– Set the circuit breakers to the Off ('0') position.
– Record the location of all the internal SCSI devices attached to the SCSI bus you are attempting to IPL from.

(Step **039** continues)

039 (continued)
– Remove all devices except the read boot disk (hdisk0).
– Set the circuit breakers to the On (‘1’) position.
– If the Maintenance Menu is displayed, select System Boot, Boot From List.
– If the system stops with a ‘260’ displayed, and the Main Menu is displayed, Select Exit Main Menu and Start System (Boot) and press Enter. When the “Starting System Boot” menu displays, press Enter. Repeat this procedure each time these conditions occur.
– Wait for one of the following conditions to occur:

- The system stops with a flashing or solid ‘269’ displayed in the operator panel display.
- The system stops with ‘c31’ displayed in the operator panel display.

Is ‘Diagnostic Operating Screen’ or ‘c31’ displayed in the operator panel display?
Yes **No**

040

One of the FRUs remaining in the CPU Enclosure is defective.
– Go to Step 042.

041

– Go to Step 053 on page 1-157.

042

– This problem can be caused by:

- The disk pulling the bus down on the SCSI adapter
- A defective SCSI adapter
- A defective terminator
- A defective SIB
- A defective cable

– Set the circuit breakers to the Off (‘0’) position.
– Remove the hdisk0.
– Perform service diagnostics from network boot. This will normally be hdisk0.
– Set the circuit breakers to the On (‘1’) position.
– If the Maintenance Menu is displayed, select System Boot, then Boot From List.
– If the system stops with a ‘260’ displayed, and the Main Menu is displayed, Select Exit Main Menu and Start System (Boot) and press Enter. When the “Starting System Boot” menu displays, press Enter. Repeat this procedure each time these conditions occur.
– Wait for one of the following conditions to occur:

- The system stops with a flashing or solid ‘269’ displayed in the operator panel display.
- The system stops with ‘c31’ displayed in the operator panel display.

Is ‘Diagnostic Operating Screen’ or ‘c31’ displayed in the operator panel display?
Yes **No**

043

One of the FRUs remaining in the CPU Enclosure is defective.
– Go to Step 045 on page 1-156.

044

(Step **044** continues)

044 (continued)
– Replace the hdisk0.
– Go to "MAP 0570: End of Call" on page 1-357.

045

– In the following order, exchange the FRUs that have not been exchanged:

- SCSI adapter
- Hdisk0 (if still in the system).
- System interface board (SIB)
- SCSI cable

– After each exchange, try performing service diagnostics from network boot to determine if the FRU fixed the problem.

Were you able to identify the failing FRU?

Yes **No**

046

One of the FRUs remaining in the CPU Enclosure is defective.
– Go to Step 048.

047

– Replace the failing FRU.
– Go to "MAP 0570: End of Call" on page 1-357.

048

– Set the circuit breakers to the Off ('0') position.
– Record the slot numbers of the adapters. Label and record the location of any cables attached to the adapters.
– Remove all the adapters from the I/O module except the SCSI.
– Remove all devices except the diag net boot disk.
– Set the circuit breakers to the On ('1') position.
– If the Maintenance Menu is displayed, select System Boot, then Boot From List.
– If the system stops with a '260' displayed, and the Main Menu is displayed, Select Exit Main Menu and Start System (Boot) and press Enter. When the "Starting System Boot" menu displays, press Enter. Repeat this procedure each time these conditions occur.
– Wait for one of the following conditions to occur:

- The system stops with a flashing or solid '269' displayed in the operator panel display.
- The system stops with 'c31' displayed in the operator panel display.

Is 'Diagnostic Operating Screen' or 'c31' displayed in the operator panel display?

Yes **No**

049

One of the FRUs remaining in the CPU Enclosure is defective.
– In the following order, exchange the FRUs that have not been exchanged:

1. I/O card (IOD)
2. I/O planars (MCA planars)
3. CPU module flex cables

(Step **049** continues)

049 (continued)

4. I/O module flex cables
5. System planar (SP)
6. System interface board (SIB)
7. CPU cards (CPU) (one at a time)
8. Memory cards (MC) (one at a time)

– Repeat Step 048 on page 1-156 until the defective FRU is identified or all the FRUs have been exchanged.

Did the symptom change?

Yes **No**

050

– Call the next level of support.

051

– Check for loose cards, cables, and obvious problems. If you do not find a problem, return to Step 001 on page 1-146 and follow the instructions for the new symptom.

052

– Go to Step 024 on page 1-152.

053

The system is working correctly with this configuration. One of the devices that you removed is probably defective.

– Set the circuit breakers to the Off (‘0’) position.
– Install a device.
– Set the circuit breakers to the On (‘1’) position.
– If the Maintenance Menu is displayed, select System Boot, Boot From List.
– If the system stops with a ‘260’ displayed, and the Main Menu is displayed, Select Exit Main Menu and Start System (Boot) and press Enter. When the “Starting System Boot” menu displays, press Enter. Repeat this procedure each time these conditions occur.
– Wait for one of the following conditions to occur:

- The system stops with a flashing or solid ‘269’ displayed in the operator panel display.
- The system stops with ‘c31’ displayed in the operator panel display.

Is ‘c31’ displayed in the operator panel display?

Yes **No**

054

The last device inserted is defective.

– Exchange the defective device or cable.
– Go to “MAP 0570: End of Call” on page 1-357.

055

– Repeat Step 053 until all of the devices are installed.

056

(Step **056** continues)

056 (continued)
– This problem can be caused by:

- A SCSI device pulling the bus down or opening the PTC on the SCSI adapter.
- A defective SCSI adapter
- A defective terminator
- A defective system interface board (SIB)
- A defective cable

The most likely problem is the SCSI adapter or a device pulling the bus down
– Set the circuit breakers to the Off (‘0’) position.
– Remove all SCSI Adapters except the one you are trying to boot from.
– Set the circuit breakers to the On (‘1’) position.
– If the Maintenance Menu is displayed, select System Boot, Boot From List.
– Wait for one of the following conditions to occur:

- The system stops with a flashing or solid ‘269’ displayed in the operator panel display.
- The DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed.

– If the system stops with a ‘c31’ in the operator panel display, follow the instructions on the display to select your console.

Is a flashing or solid ‘269’ displayed in the operator panel display?

Yes **No**

057

If the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, the system is working correctly. It means that one of the SCSI adapters you removed was defective.
– Reinstall the SCSI adapters one by one until you find the defective one.
– Go to “MAP 0570: End of Call” on page 1-357.
– If you have a different symptom, go to Step 001 on page 1-146 and follow the instructions for the new symptom.

058

– Go to Step 039 on page 1-154.

059

A message should be displayed with the flashing ‘269’.
– Find the message in the following table and do the listed action.

Message Displayed	Action
269 - NO BOOTABLE	Go to Step 060.
269 - NO DEVICE	Go to Step 039 on page 1-154.
269 - NO DEV TYPE	Go to Step 063 on page 1-159.

060

– In the following order, exchange the FRUs that have not been exchanged:

1. SCSI adapter
2. I/O Planar

(Step **060** continues)

060 (continued)

3. I/O Card
4. Flex Cable

– After each exchange, try performing service diagnostics from network boot to determine if the FRU fixed the problem.

Were you able to identify the failing FRU?

Yes **No**

061

– Go to Step 039 on page 1-154.

062

– Replace the failing FRU.
– Go to "MAP 0570: End of Call" on page 1-357.

063

– Exchange the hdisk0.
– Try performing service diagnostics from network boot to determine if the FRU fixed the problem.

Were you able to identify hdisk0 as the failing FRU?

Yes **No**

064

– Go to Step 039 on page 1-154.

065

– Replace the hdisk0.
– Go to "MAP 0570: End of Call" on page 1-357.

MAP 0290: 332 MHz SMP Node Environment

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

001

Are any messages displayed?

Yes **No**

002

Go to Step 010 on page 1-161.

003

TTY message indicates “rc.powerfail” or **errpt -a | pg** displays “Loss of Electric Power” associated with processor node.

– Check 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.

Does message indicate loss of power or power off?

Yes **No**

004

Is the message a *warning*?

Yes **No**

005

Go to Step 010 on page 1-161.

006

Message is a warning only.

Does this same message occur on more than one processor node?

Yes **No**

007

No immediate service required.

– Maintenance can be done now by returning to Step 009, and treating the warning message as a “Shutdown” or “Failure” message, or service can be deferred until a later date.

008

– Notify next level of support.

009

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.

(Step **009** continues)

009 (continued)
– Based on the text of the message, use the following table to continue service:

Condition	Action
Any power loss message	Go to Step 010.
"...cooling problem..." or fan problem	Go to Step 056 on page 1-166.
"...memory protect..."	Go to Step 060 on page 1-167.

010

Power problem condition exists.
– Check the node supervisor green LED 1.
Is the node supervisor green LED 1 On or flashing?
Yes **No**

011

LED 1 is Off.
– Go to "MAP 0300: 332 MHz SMP Node Power" on page 1-169.

012

Is the node supervisor green LED 1 On (but not flashing)?
Yes **No**

013

LED 1 is flashing.
– Go to Step 027 on page 1-163.

014

LED 1 is On.
– Check the power supply green LED(s).
Is the power supply green LED(s) On?
Yes **No**

015

Verify the CB(s) is in the On position.
Is the CB(s) in the On position?
Yes **No**

016

Set the CB(s) to the On position.
– Go to Step 010.

017

Verify the 48 V input cable(s) is plugged in the rear of the node.
(Step **017** continues)

017 (continued)
Is the 48 V power supply cable plugged properly?
Yes **No**

018

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.

Connect the 48 V input cable(s) properly.
– Go to Step 010 on page 1-161.

019

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.

Check for 48 volts present at the 332 MHz SMP processor node end of the input cable(s). Measure between the voltage and the return pins.
Is there 48 volts present at the connector(s)?
Yes **No**

020

– Go to Step 048 on page 1-165.

021

Problem with 48 volts sensing.
– Go to Step 044 on page 1-164

022

Is the CPU power assembly green LED On (but not flashing)?
Yes **No**

023

– Go to Step 027 on page 1-163.

024

The green LED is On.
– Check for airflow blockage and/or fan or cooling problems with the node.
Do any of these problems exist?
Yes **No**

025

– Verify that you have the correct processor node. Then go to “MAP 0130: Processor Node” on page 1-30.

026

(Step **026** continues)

026 (continued)
– Go to Step 056 on page 1-166.

027

Is this a wide node (I/O expansion assembly attached and no supervisor card in left side)?
Yes **No**

028

– Go to "MAP 0370: Main Power" on page 1-222.

029

Is the I/O power assembly green LED on or flashing?
Yes **No**

030

Go to Step 014 on page 1-161.

031

Is the I/O power assembly green LED on (not flashing)?
Yes **No**

032

Check CPU and I/O power assembly yellow LEDs.
Are the yellow LEDs on or flashing?
Yes **No**

033

– Go to "MAP 0130: Processor Node" on page 1-30.

034

Are the yellow LEDs flashing?
Yes **No**

035

– Go to "MAP 0110: Supervisor Subsystem" on page 1-10.

036

Go to Step 038.

037

– Go to "MAP 0130: Processor Node" on page 1-30.

038

(Step **038** continues)

038 (continued)
Are supervisor LEDs #3 and/or #4 flashing?
Yes **No**

039

– Go to "MAP 0130: Processor Node" on page 1-30.

040

–

Use the following prioritized table to continue service:

Priority	Component	Action
1	Interposer connector cable	1. Replace cable 2. Go to Step 041
2	interposer connector card	1. Replace card 2. Go to Step 041
3	CPU or I/O power assembly	1. Replace assembly 2. Go to Step 041
4	CPU I/O planar	1. Replace I/O planar 2. Go to Step 041
5	All replaced	Call next level of support.

041

– Remove processor node from service position.
– From the control workstation, power on the processor node.
Are supervisor LEDs #3 and/or #4 flashing?
Yes **No**

042

Go to Step 055 on page 1-166.

043

Go to Step 038 on page 1-163 and replace the next highest priority component.

044

Problem with 48 volts sensing.
– From the control workstation, power off the processor node.
– Place the processor node in the service position.
–

Use the following prioritized table to continue service:

Priority	Component	Action
1	Service processor card	1. Replace card 2. Go to Step 045 on page 1-165
2	I/O expansion control cable	1. Replace cable assembly 2. Go to Step 045 on page 1-165
3	CPU or I/O power assembly	1. Replace assembly 2. Go to Step 045 on page 1-165
4	I/O planar	1. Replace planar 2. Go to Step 045 on page 1-165
5	Power or power/supervisor cable assembly	1. Replace assembly 2. Go to Step 045 on page 1-165
6	All replaced	Call next level of support.

045

– Remove processor node from service position.
– From the control workstation, power on the processor node.

Is the power supplies green LED off or flashing?

Yes **No**

046

Go to Step 055 on page 1-166.

047

Go to Step 044 on page 1-164 and replace the next highest priority component.

048

Problem with 48 volts supplied to power supply.

– Place the 332 MHz SMP node into service position. Replace the node supervisor card. Refer to "Replacing the Node Supervisor Card" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Replace the 332 MHz SMP node from the service position.

Is the power supplies green LED Off or flashing?

Yes **No**

049

– Go to Step 055 on page 1-166.

050

– Place the 332 MHz SMP node in service position, and replace the power/supervisor cable assembly. Refer to "Replacing the Power/Supervisor Cable Assembly" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Replace the 332 MHz SMP node from the service position.

(Step **050** continues)

050 (continued)
Is the power supplies green LED Off or flashing?
Yes **No**

051

– Go to Step 055.

052

– Place the 332 MHz SMP node in service position, and replace the front assembly FRU. Refer to "Replacing the CPU and I/O Expansion Power Assemblies" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Replace the 332 MHz SMP node from the service position.
Is the power supplies green LED Off or flashing?
Yes **No**

053

– Go to Step 055.

054

– Go to “MAP 0430: dc Power Loss from Bulk dc Power Supply(s)” on page 1-250

055

– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breakers at front of processor node in On (‘1’) position.
– Go to “MAP 0570: End of Call” on page 1-357.

056

“...cooling problem...” or fan problem condition exists.
– Place processor node in service position.
– Use the following table to reseat or replace components:

Priority	Component	Action
1	Fan 1, 2 (3, 4 if 332 MHz SMP wide node) **Note:** See Figure 1-12 on page 1-45.	1. Check specified fan for blockage or loose cable connection. Refer to "Power/Keylock Status Register (PKSR)" in *RS/6000 SP: Maintenance Information, Volume 3* to decode power register bits. 2. Fix any obvious problem(s). If none are found, continue at Priority 2. 3. Continue at Step 057 on page 1-167.
2	Fan 1, 2 (3, 4 if 332 MHz SMP wide node) **Note:** See Figure 1-12 on page 1-45.	1. Replace fan and/or cooling module as described in "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. Refer to "Power/Keylock Status Register (PKSR)" in *RS/6000 SP: Maintenance Information, Volume 3* to decode power register bits. 2. Fix any obvious problem(s). 3. Continue at Step 057 on page 1-167.
3	Front assembly FRU	1. Replace assembly 2. Continue at Step 057 on page 1-167.
4	Power/supervisor cable assembly	1. Replace assembly 2. Continue at Step 057 on page 1-167.
7	All replaced	Call next level of support.

057

Component replaced or reseated.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breakers at the front of processor node in the On (‘1’) position.
– Check error log or SRN.

Does the problem still exist?

Yes **No**

058

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

059

– Put circuit breakers at the front of the processor node in the Off (‘0’) position.
– Reinstall the previously removed component.
– Go to Step 056 on page 1-166 to service next highest priority component.

060

Memory protection error: “memoryProtect”

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

(Step **060** continues)

060 (continued)
Have memory parts been changed recently (since last successful IPL) in this processor node?
Yes **No**

061

Problem may be: base memory card, CPU card, I/O planar, or node supervisor control cable.
– Replace parts, one at a time, until problem is corrected.
Are you able to correct the problem?
Yes **No**

062

Call next level of support.

063

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

064

– Check memory card and SIMM part numbers in *Diagnostic Information for Micro Channel Bus Systems* (SA38-0532) and *Adapters, Devices and Cable Information* (SA38-0533) to ensure that they are compatible with the fastest Type 7013 machines.
– If necessary, call next level of support.

MAP 0300: 332 MHz SMP Node Power

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

001

Ensure all circuit breakers for this node (power assembly and 48-volt in-line) are in the ON ('1') position

Is this a wide node (I/O expansion assembly attached and no supervisor card in left side)?

Yes **No**

002

– Go to Step 008.

003

Are the I/O power assembly power interlock bar and tab engaged correctly?

Yes **No**

004

– Reseat the I/O power assembly and ensure the power interlock bar and tab are engaged correctly.

Have the problem symptoms changed?

Yes **No**

005

– Go to Step 008.

006

– Go to "MAP 0130: Processor Node" on page 1-30.

007

– Go to Step 008.

008

– Check the node supervisor card green LED 1.

Is the green LED 1 Off?

Yes **No**

009

Processor node getting 48 V dc power.

Is the node supervisor green LED 1 flashing?

Yes **No**

010

Green LED 1 is On, indicating no problem with power supply.

– Verify that you have the proper processor node, then go to "MAP 0130: Processor Node" on page 1-30.

011

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.

Ensure that the 48-volt power supply cable(s) is connected and the cable circuit breaker is in the ON position.

Is the node supervisor (green) LED #3 ON or flashing (also LED #4 if this is a wide node).

Yes **No**

012

– Go to Step 021 on page 1-171.

013

Processor node is getting power.

– Power on RS/6000 logic from the virtual front panel on the control workstation.

Does green LED 1 light and stay lit?

Yes **No**

014

– Check the front assembly power interlock bar(s) and power interlock tab(s) are engaged properly.

Are the power interlock bar(s) and tab(s) engaged properly?

Yes **No**

015

Engage the front assembly power interlock bar(s) and power interlock tab(s).

– Go to Step 027 on page 1-171.

016

Check for short conditions.

– Go to "MAP 0320: 332 MHz SMP Node Minimum Configuration" on page 1-186.

017

RS/6000 logic getting power.

Does processor node IPL successfully?

Yes **No**

018

Processor node has problem with IPL.

– Go to "MAP 0130: Processor Node" on page 1-30.

019

No problem detected.

– Record reason for power-off condition.

(Step **019** continues)

019 (continued)
– Go to "MAP 0570: End of Call" on page 1-357.

020

– Go to Step 037 on page 1-172.

021

Is the power supplies yellow LED on or flashing?
Yes **No**

022

Verify the CB is On.
– Go to Step 030.

023

+48 V present.
Is the power supplies green power LED flashing?
Yes **No**

024

Is the power supplies green LED on steady?
Yes **No**

025

The LED is Off.
– Exchange the power supply.

026

– Go to "MAP 0570: End of Call" on page 1-357.

027

Switch the CB Off, then On.
Did the green LED light and the node IPL?
Yes **No**

028

– Go to MAP 0290: 332 MHz SMP Node Environment, Step 048 on page 1-165.

029

– Go to "MAP 0570: End of Call" on page 1-357.

030

(Step **030** continues)

030 (continued)
Is the CB switched On?
Yes **No**

031

Set the CB to the On position.
Did the CB switch on and stay on?
Yes **No**

032

Did the CB trip?
Yes **No**

033

– Go to Step 021 on page 1-171.

034

Possible power supply problem or short condition.
– Go to Step 043 on page 1-173.

035

– Go to Step 008 on page 1-169.

036

Node 48 volts missing.
– Go to MAP 0290: 332 MHz SMP Node Environment, Step 017 on page 1-161.

037

Check the node supervisor card yellow LED 5.
Is the yellow LED 5 Off?
Yes **No**

038

Base code loaded on node supervisor card.
– Go to "Updating the Node Supervisor Code" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 050 on page 1-174.

039

– Check the power supplies green LED.
Is the power supplies green LED Off?
Yes **No**

040

– Go to MAP 0290: 332 MHz SMP Node Environment, Step 014 on page 1-161.

041

– Check circuit breaker(s) at front of power supplies. Put these circuit breaker(s) in the On ('1') position if they are not already.

Do the circuit breakers go (trip) to the Off ('0') position?

Yes **No**

042

– Go to Step 050 on page 1-174.

043

– Place processor node in service position.

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.

– Check the 48-volt bulk power harnesses at power supplies in the rear of the node, at the connection to the circuit breakers, and at the 48-volt bulk power connections for any obvious problems which might cause a short.

Does everything appear to be okay?

Yes **No**

044

– Fix obvious problem(s).
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Go to Step 041.

045

– Using a multimeter, check for a short between the pins of the 48-volt input connector(s) (J8 at the rear of the node).

Was a shorted condition detected?

Yes **No**

046

– Disconnect the 48-volt power cable(s) from the SEPBU bulkhead.
– Using a multimeter, check for a short between pins in the 48-volt power cable(s).
– Using a multimeter, check for a short between any pins in node power plug(s).
– If a short is detected, replace the 48-volt power cable.
– Using a multimeter, check for a short between any tabs in circuit breaker(s).
– If a short is detected, isolate it to either the cable or circuit breaker and replace the corresponding part.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Go to Step 041.

047

– Using a multimeter, check for a short between the pins of the power/supervisor connector at the rear of the front assembly.

(Step **047** continues)

047 (continued)
Was a shorted condition detected?
Yes **No**

048

– Replace the power/supervisor cable assembly in the logic part of the node.
– Remove processor node from service position.
– Reconnect all cables at rear of processor node.
– Go to Step 041 on page 1-173.

049

– Replace corresponding power supply.
– Remove processor node from service position.
– Reconnect all cables at rear of processor node.
– Go to Step 041 on page 1-173.

050

– From control workstation or processor node, check node supervisor green LED 1 for this node.
Is node supervisor green LED 1 off or is 'No Power to Node' displayed on the control workstation?
Yes **No**

051

Processor node problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

052

– Check processor node(s) on any other dc power harness for any that are powered on. Ensure that the other processor node has its circuit breaker in the On ('1') position.
– Check the green LED 1 for an On or Flashing condition.
– 332 MHz SMP processor nodes receive 48-volt power by connecting a power cable between the node and the SEPBU bulkhead.

```
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
```

Is the green LED 1 on any other processor node On or Flashing?
Yes **No**

053

– Go to "MAP 0370: Main Power" on page 1-222.

054

– Check all other processor nodes on the same dc power harness as the failing processor node to check for the same symptom - circuit breaker on but green LED 1 not lit.
(Step **054** continues)

054 (continued)

Is this the only processor node showing this symptom?

Yes **No**

055

Problem with 48 V dc power distribution.

– Go to "MAP 0480: Open in 48 V dc Distribution" on page 1-283.

056

– Check the cable connections at the rear of the processor node and at the 48-volt power distribution connection.

Is there a good connection?

Yes **No**

057

– Fix cable connection problem.

– Go to Step 050 on page 1-174.

058

– Put the circuit breakers in the 48-volt input cable in the "on" (1) position.

– Check for 48 volts present at the 332 MHz SMP processor node end of the input cable(s). Measure between the voltage and the return pins.

Is there 48 volts present at the connector(s)?

Yes **No**

059

Voltage is missing at the input cable(s).

– Replace the 48-volt input cable(s).

Is 48 volts still missing at the connector end?

Yes **No**

060

– Go to Step 062.

061

– Go to "MAP 0480: Open in 48 V dc Distribution" on page 1-283.

062

48 volts distribution is getting to node.

– Check power supply green LED(s) and running fans.

Are the power supply green LED(s) On and fans running?

Yes **No**

063

– Go to MAP 0290: 332 MHz SMP Node Environment, Step 014 on page 1-161.

064

(Step **064** continues)

064 (continued)
– Go to Step 008 on page 1-169.

MAP 0310: 332 MHz SMP Node Control

Attention: If a 332 MHz SMP 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 High Performance Switch (HiPS) feature or Scalable POWERparallel Switch (SPS) 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.

Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

Refer to "Viewing Switch Partitions" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for locating and fencing/unfencing nodes within a switch partition.

001

Processor node problem detected by customer or CE.
– Use the following table to continue service:

Condition	Action
• Problem with node power	Go to “MAP 0290: 332 MHz SMP Node Environment” on page 1-160.
• Node will not reset	Go to Step 002.
• No response from TTY console	• Close existing TTY window and open another. • Go to Step 019 on page 1-180.
• Yellow or green LEDs on node will not light.	Go to Step 039 on page 1-184.

002

Node will not reset.
– Check with customer to make sure this processor node is not in the current active configuration. If processor node is *not* operational and actively working at this time, continue service. If it *is* operational and actively working, schedule a time convenient for the customer.
– From the control workstation, open the node front panel display.
– Issue reset for this processor node.

Does processor node reset?

Yes **No**

003

Problem with reset.
– Go to Step 007 on page 1-178.

004

Intermittent problem may be occurring.
– Please record following:

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

– Check logs to see if this fault has been previously recorded.
Is this a recurring fault?
Yes **No**

005

This is not a recurring fault.
– Go to “MAP 0570: End of Call” on page 1-357.

006

Reoccurrence of intermittent fault has been detected.
– Treat this fault as a solid failure.
– Go to Step 017 on page 1-179.

007

– From the control workstation node front panel display:

- Shutdown and power-off processor node.
- Power-on processor node.
- Check LCDs for sequence indicating IPL.

Do the LCDs change?
Yes **No**

008

Node supervisor card not responding to commands.
– Go to “MAP 0110: Supervisor Subsystem” on page 1-10.

009

Processor node is IPLing.
Do LCDs eventually indicate completion of IPL sequence (i.e. blank or “uuu”)?
Yes **No**

010

Processor node has problem IPLing.
– Go to Step 008 on page 1-88 to continue service.

011

– From node front panel display, click on “TTY” button to open a TTY console.
– From the TTY console:

- Select “Advanced Diagnostic Routines”

(Step **011** continues)

011 (continued)

- Select “System Verification”
- Select “Base System”.

Does this test indicate a failure?

Yes **No**

012

– From the control workstation, reset this processor node.

Does processor node reset?

Yes **No**

013

Problem with reset.

– Go to Step 017 to continue isolation.

014

Node reset functioning properly.

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

Yes **No**

015

This is an intermittent problem.

– Please record following tracking information:

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

– Go to “MAP 0570: End of Call” on page 1-357.

016

Problem resolved.

– Go to “MAP 0570: End of Call” on page 1-357.

017

Problem with reset.

– From the control workstation, power off processor node.

– Place processor node in service position.

– Use the following prioritized table to continue service:

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 018 on page 1-180 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 018 on page 1-180 to verify fix.
3	I/O Planar Board	1. Replace board. 2. Go to Step 018 on page 1-180 to verify fix.
4	All replaced	Call next level of support.

018

Component has been repaired or replaced.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put the circuit breaker at the front of the processor node in the On (‘1’) position.
– Go to Step 009 on page 1-178 to continue service.

019

No response from TTY console for a processor node.
– From the system file server, telnet into this processor node:

telnet *nodename*

– Log in as “root”.
– Have the customer check to make sure that the TTY port on the processor node is correctly defined.

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

   smit console

   Use the menu options to check and/or 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.
2. Check the TTY configuration by issuing the following command in the processor node's window:

   smit tty

   Use the menu options to check and/or reconfigure the “s1” TTY port as required. The proper TTY parameters are listed in *IBM RS/6000 SP: Administration Guide*.

Is the TTY port defined properly, and the console setup to use the TTY port?
Yes **No**

020

TTY not responding due to customer configuration.
– Customer must configure these parameters.
– Go to “MAP 0570: End of Call” on page 1-357.

021

(Step **021** continues)

021 (continued)
Problem due to hardware.
– Close console TTY window (if already open).
– Log into the node over the Ethernet:

telnet *nodename*

– Enter the following command:

chcons /dev/tty1
– Use **diag** command to run regular (not advanced) diagnostics on "TTY0".
Do the diagnostics pass (no problem found)?
Yes **No**

022

– Run wrap diagnostics on S1 to node supervisor cable.
Do diagnostics fail?
Yes **No**

023

– Go to Step 027.

024

– Run wrap diagnostics on S1.
Do diagnostics pass (no trouble found)?
Yes **No**

025

– Replace I/O planar board.
– Go to Step 028 on page 1-182.

026

– Go to Step 027.

027

– Log into the node over the Ethernet:

telnet *nodename*

– Enter the following command:

chcons /dev/tty0
– From the control workstation, make sure the node front panel display is open.
– Close TTY console at this time.
– Have the customer remove the processor node from the active system configuration and power off the processor node.
– Put the circuit breaker at the front of the processor node in the Off ('0') position.
– Place processor node in service position.
– Refer to the following table for priority of replacement or repair of components.

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 028 on page 1-182 to verify fix.
2	I/O planar	1. Replace I/O planar. 2. Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 3. Go to Step 028 on page 1-182 to verify fix.
3	Cables between frame supervisor and node supervisor card	1. Replace cable. 2. Go to Step 028 on page 1-182 to verify fix.
4	All replaced	Call next level of support.

028

Component has been repaired or replaced.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– As processor node completes IPL, check the TTY console window.
– From the control workstation node front panel display, put the processor node in SERVICE mode.
– Put the circuit breaker at the front of the processor node in the On (‘1’) position.

Do you get any data on the TTY console screen?

Yes **No**

029

– Go to Step 027 on page 1-181 to service next highest priority component.

030

Processor node IPLed in SERVICE mode.
– From the TTY console:

- Select “Advanced Diagnostic Routines”
- Select “System Verification”
- Select “Base System”

Does processor node pass all diagnostics?

Yes **No**

031

– Repair problem as indicated by diagnostics. Use “MAP 0130: Processor Node” on page 1-30 as necessary.

032

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

033

(Step **033** continues)

033 (continued)
LCD problem.
– Have the customer remove the processor node from the active system configuration and power off the processor node.
– Put the circuit breaker at the front of the processor node in the Off ('0') position.
– Place processor node in service position.
– Refer to the following table for priority of replacement or repair of components.

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 034 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 034 to verify fix.
3	I/O Planar Board	1. Replace board. 2. Go to Step 034 to verify fix.
4	All Replaced	Call next level of support.

034

Component has been repaired or replaced.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– From the control workstation, power on this processor node.
– From the control workstation, make sure the LCDs for this processor node are displayed on the screen.
– Check the LCDs for the IPL sequence.

Do the LCDs indicate the IPL sequence?
Yes **No**

035

– Go to Step 033 on page 1-182 to service next highest priority component.

036

– From the TTY console:

- Select "Advanced Diagnostic Routines"
- Select "System Verification"
- Select "Base System"

Does processor node pass all diagnostics?
Yes **No**

037

– Repair problem as indicated by diagnostics. Use "MAP 0130: Processor Node" on page 1-30 as necessary.

038

(Step **038** continues)

038 (continued)
Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

039

Yellow or green LED on node supervisor is not functioning.
– Have the customer remove the processor node from the active system configuration and power off the processor node.
– Put the circuit breakers at the front of the processor node in the Off (‘0’) position.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, ignoring PASS/FAIL results.
– Check yellow and green LEDs on the node supervisor card to see if each LED lights at some point.

Does each of the eight LEDs light at any time?

Yes

No

040

– Place processor node in service position.
– Repeat "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Check to see if same color LED is always Off in front and rear.

Are LEDs of same color always Off in rear?

Yes

No

041

– Replace LED display card.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Do both LEDs light at any time?

Yes

No

042

– Go to Step 044.

043

Problem resolved.
– Go to Step 045.

044

– Replace the node supervisor card.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to verify replacement.
– Go to Step 045.

045

All LEDs are operating.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
(Step **045** continues)

045 (continued)
– Go to “MAP 0570: End of Call” on page 1-357.

MAP 0320: 332 MHz SMP Node Minimum Configuration

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

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

001

Check if this 332 MHz SMP node is a thin node or a wide node (thin node with an *I/O expansion chassis*.
Is this a wide node?

Yes **No**

002

The problem exists in the thin node.
– Go to Step 012 on page 1-187 to test the thin node minimum configuration.

003

Split the thin node and I/O expansion assembly.
– Shutdown the node, if possible.
– Set the circuit breakers to the Off (‘0’) position.
– Remove the PCI riser card assembly cable from J6 on the I/O planar.
– Remove the I/O expansion control cable from J2 on the I/O planar.
– Remove the DASD cable (4-drop) from the I/O expansion assembly DASD.
– Unplug and reseat the node supervisor cable to recognize the new thin node configuration.
– IPL the thin node.

Does the node IPL properly?

Yes **No**

004

The problem exists in the thin node.
– Go to Step 012 on page 1-187 to test the thin node minimum configuration.

005

Remove the following components in the I/O expansion chassis bringing it to the minimum configuration:

Record the slot numbers of the PCI adapters. Label and record the location of any cables attached to the adapters. Remove all the PCI adapters.

(Step **005** continues)

005 (continued)
– Reconnect the PCI riser card assembly cable to J6 on the I/O planar.
– Reconnect the I/O expansion control cable to J2 on the I/O planar.
– Reseat the node supervisor by unplugging, then plugging, the supervisor cable at the rear of the node.
– Set the circuit breaker to the On (‘|’) position.

Does the node IPL properly?

Yes **No**

006

A problem exists in the I/O expansion chassis.
– Go to Step 021 on page 1-189 to test the wide node minimum configuration.

007

Add the components removed in Step 005 on page 1-186, one at a time, and IPL the node.

Does the node IPL properly?

Yes **No**

008

Component failed.
– Replace failing component and IPL the node.

Does the node IPL properly?

Yes **No**

009

Component failed.
– Replace failing component.
– Go to Step 008

010

Component is working correctly.
– Go to Step 007 to add another component. If all components have been installed, go to “MAP 0570: End of Call” on page 1-357.

011

Component is working correctly.
– Go to Step 007 to add another component. If all components have been installed, go to “MAP 0570: End of Call” on page 1-357.

012

Remove the following components in the thin node bringing it to the minimum configuration:

Record the slot numbers of the PCI adapters. Label and record the location of any cables attached to the adapters. Remove all the PCI adapters.
If necessary, remove the SPS MX adapter card from slot J9.
Remove one memory card (if there are two).
Remove the DIMMs from the remaining card except for the DIMMs in locations J1 and J2. (For 332 MHz SMP Node memory card - DIMM locations, refer to "Location Diagrams of the RS/6000 SP Components" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.)
(Step **012** continues)

012 (continued)
Remove CPU card 2 (slots J5/J6), if installed.
Remove all DASD except for the boot DASD (hdisk0).

– Set the circuit breaker to the On ('|') position.
– Reseat the node supervisor by unplugging, then plugging, the supervisor cable at the rear of the node.

Does the node IPL properly?
Yes **No**

013

Replace the following components, one at a time, and IPL the node.

Memory DIMM
Memory card
CPU card
Service processor card
Boot DASD
DASD cable (2-drop or 4-drop)
I/O planar
System planar
Flat ribbon power cable

Does the node IPL properly?
Yes **No**

014

– Replace next component in list on Step 013.
– If all components have been replaced, call next level of support.

015

Last component replaced was defective.
– Go to Step 016.

016

Add the components removed in Step 012 on page 1-187, one at a time, and IPL the node.

Does the node IPL properly?
Yes **No**

017

Component failed.
– Replace failing component and IPL the node.

Does the node IPL properly?
Yes **No**

018

Component failed.
– Replace failing component.
– Go to Step 017

019

(Step **019** continues)

019 (continued)
Component is working correctly.
– Go to Step 016 on page 1-188 to add another component. If all components have been installed, go to "MAP 0570: End of Call" on page 1-357.

020

Component is working correctly.
– Go to Step 016 on page 1-188 to add another component. If all components have been installed, go to "MAP 0570: End of Call" on page 1-357.

021

Run minimum configuration on the wide node (minimum configured I/O expansion chassis and a thin node that IPLs correctly).
– Replace the I/O expansion control cable and IPL the node.
Does the IPL fail?
Yes **No**

022

Add components (removed in Step 005 on page 1-186), one at a time, in the following order and IPL the node:

PCI adapters (one at a time), if applicable
Reconnect the DASD cable (4-drop) to the front of the I/O expansion assembly DASD.
DASD (one at a time), if applicable.

Did the node IPL properly?
Yes **No**

023

Component failed.
– Replace failed component and IPL.
Did node IPL properly?
Yes **No**

024

Component failed.
– Replace failed component.
– Go to Step 023.

025

– Go to Step 022.

026

Component working correctly.
– Go to Step 022.
– If all components are installed, go to "MAP 0570: End of Call" on page 1-357.

027

(Step **027** continues)

027 (continued)
– Replace the PCI riser card assembly and IPL the node.
Does the IPL fail?
Yes **No**

028

– Go to Step 022 on page 1-189.

029

– Replace the PCI expansion planar and IPL the node.
Does the IPL fail?
Yes **No**

030

– Go to Step 022 on page 1-189.

031

Replace the interposer adapter cable.
Does the IPL fail?
Yes **No**

032

Go to Step 022 on page 1-189.

033

– Replace the interposer adapter card.
Does the IPL fail?
Yes **No**

034

Go to Step 022 on page 1-189.

035

Replace the power assembly.
Does the IPL fail?
Yes **No**

036

Go to Step 022 on page 1-189.

037

– Call next level of support.

MAP 0330: POWER3 SMP Thin and Wide Node Environment

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

001

Are any messages displayed?

Yes **No**

002

Go to Step 010 on page 1-192.

003

TTY message indicates “rc.powerfail” or **errpt -a | pg** displays “Loss of Electric Power” associated with processor node.

– Check 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.

Does message indicate loss of power or power off?

Yes **No**

004

Is the message a *warning*?

Yes **No**

005

Go to Step 010 on page 1-192.

006

Message is a warning only.

Does this same message occur on more than one processor node?

Yes **No**

007

No immediate service required.

– Maintenance can be done now by returning to Step 009, and treating the warning message as a “Shutdown” or “Failure” message, or service can be deferred until a later date.

008

– Notify next level of support.

009

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.

(Step **009** continues)

009 (continued)
– Based on the text of the message, use the following table to continue service:

Condition	Action
Any power loss message	Go to Step 010.
"...cooling problem..." or fan problem	Go to Step 056 on page 1-197.
"...memory protect..."	Go to Step 060 on page 1-198.

010

Power problem condition exists.
– Check the node supervisor green LED 1.
Is the node supervisor green LED 1 On or flashing?
Yes **No**

011

LED 1 is Off.
– Go to "MAP 0340: POWER3 SMP Thin and Wide Node Power" on page 1-200.

012

Is the node supervisor green LED 1 On (but not flashing)?
Yes **No**

013

LED 1 is flashing.
– Go to Step 027 on page 1-194.

014

LED 1 is On.
– Check the power supply green LED(s).
Is the power supply green LED(s) On?
Yes **No**

015

Verify the CB(s) is in the On position.
Is the CB(s) in the On position?
Yes **No**

016

Set the CB(s) to the On position.
– Go to Step 010.

017

Verify the 48 V input cable(s) is plugged in the rear of the node.
(Step **017** continues)

017 (continued)
Is the 48 V power supply cable plugged properly?
Yes **No**

018

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.

Connect the 48 V input cable(s) properly.
– Go to Step 010 on page 1-192.

019

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.

Check for 48 volts present at the POWER3 SMP processor node end of the input cable(s). Measure between the voltage and the return pins.
Is there 48 volts present at the connector(s)?
Yes **No**

020

– Go to Step 048 on page 1-196.

021

Problem with 48 volts sensing.
– Go to Step 044 on page 1-195

022

Is the CPU power assembly green LED On (but not flashing)?
Yes **No**

023

– Go to Step 027 on page 1-194.

024

The green LED is On.
– Check for airflow blockage and/or fan or cooling problems with the node.
Do any of these problems exist?
Yes **No**

025

– Verify that you have the correct processor node. Then go to “MAP 0130: Processor Node” on page 1-30.

026

(Step **026** continues)

026 (continued)
– Go to Step 056 on page 1-197.

027

Is this a wide node (I/O expansion assembly attached and no supervisor card in left side)?
Yes **No**

028

– Go to "MAP 0370: Main Power" on page 1-222.

029

Is the I/O power assembly green LED on or flashing?
Yes **No**

030

Go to Step 014 on page 1-192.

031

Is the I/O power assembly green LED on (not flashing)?
Yes **No**

032

Check CPU and I/O power assembly yellow LEDs.
Are the yellow LEDs on or flashing?
Yes **No**

033

– Go to "MAP 0130: Processor Node" on page 1-30.

034

Are the yellow LEDs flashing?
Yes **No**

035

– Go to "MAP 0110: Supervisor Subsystem" on page 1-10.

036

Go to Step 038.

037

– Go to "MAP 0130: Processor Node" on page 1-30.

038

(Step **038** continues)

038 (continued)
Are supervisor LEDs #3 and/or #4 flashing?
Yes **No**

039

– Go to "MAP 0130: Processor Node" on page 1-30.

040

–

Use the following prioritized table to continue service:

Priority	Component	Action
1	Interposer connector cable	1. Replace cable 2. Go to Step 041
2	interposer connector card	1. Replace card 2. Go to Step 041
3	CPU or I/O power assembly	1. Replace assembly 2. Go to Step 041
4	CPU I/O planar	1. Replace I/O planar 2. Go to Step 041
5	All replaced	Call next level of support.

041

– Remove processor node from service position.
– From the control workstation, power on the processor node.
Are supervisor LEDs #3 and/or #4 flashing?
Yes **No**

042

Go to Step 055 on page 1-197.

043

Go to Step 038 on page 1-194 and replace the next highest priority component.

044

Problem with 48 volts sensing.
– From the control workstation, power off the processor node.
– Place the processor node in the service position.
–

Use the following prioritized table to continue service:

Priority	Component	Action
1	Service processor card	1. Replace card 2. Go to Step 045 on page 1-196
2	I/O expansion control cable	1. Replace cable assembly 2. Go to Step 045 on page 1-196
3	CPU or I/O power assembly	1. Replace assembly 2. Go to Step 045 on page 1-196
4	I/O planar	1. Replace planar 2. Go to Step 045 on page 1-196
5	Power or power/supervisor cable assembly	1. Replace assembly 2. Go to Step 045 on page 1-196
6	All replaced	Call next level of support.

045

– Remove processor node from service position.
– From the control workstation, power on the processor node.

Is the power supplies green LED off or flashing?

Yes **No**

046

Go to Step 055 on page 1-197.

047

Go to Step 044 on page 1-195 and replace the next highest priority component.

048

Problem with 48 volts supplied to power supply.

– Place the POWER3 SMP node into service position. Replace the node supervisor card. Refer to "Replacing the Node Supervisor Card" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Replace the POWER3 SMP node from the service position.

Is the power supplies green LED Off or flashing?

Yes **No**

049

– Go to Step 055 on page 1-197.

050

– Place the POWER3 SMP node in service position, and replace the power/supervisor cable assembly. Refer to "Replacing the Power/Supervisor Cable Assembly" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Replace the POWER3 SMP node from the service position.

(Step **050** continues)

050 (continued)

Is the power supplies green LED Off or flashing?

Yes **No**

No → **051**

– Go to Step 055.

Yes → **052**

– Place the POWER3 SMP node in service position, and replace the front assembly FRU. Refer to "Replacing the CPU and I/O Expansion Power Assemblies" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Replace the POWER3 SMP node from the service position.

Is the power supplies green LED Off or flashing?

Yes **No**

No → **053**

– Go to Step 055.

Yes → **054**

– Go to “MAP 0430: dc Power Loss from Bulk dc Power Supply(s)” on page 1-250

055

– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breakers at front of processor node in On (‘1’) position.
– Go to “MAP 0570: End of Call” on page 1-357.

056

“...cooling problem...” or fan problem condition exists.
– Place processor node in service position.
– Use the following table to reseat or replace components:

Priority	Component	Action
1	Fan 1, 2 (3, 4 if POWER3 SMP wide node) **Note:** See Figure 1-13 on page 1-46.	1. Check specified fan for blockage or loose cable connection. Refer to "Power/Keylock Status Register (PKSR)" in *RS/6000 SP: Maintenance Information, Volume 3* to decode power register bits. 2. Fix any obvious problem(s). If none are found, continue at Priority 2. 3. Continue at Step 057 on page 1-198.
2	Fan 1, 2 (3, 4 if POWER3 SMP wide node) **Note:** See Figure 1-13 on page 1-46.	1. Replace fan and/or cooling module as described in "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. Refer to "Power/Keylock Status Register (PKSR)" in *RS/6000 SP: Maintenance Information, Volume 3* to decode power register bits. 2. Fix any obvious problem(s). 3. Continue at Step 057 on page 1-198.
3	Front assembly FRU	1. Replace assembly 2. Continue at Step 057 on page 1-198.
4	Power/supervisor cable assembly	1. Replace assembly 2. Continue at Step 057 on page 1-198.
7	All replaced	Call next level of support.

057

Component replaced or reseated.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put circuit breakers at the front of processor node in the On (‘1’) position.
– Check error log or SRN.

Does the problem still exist?

Yes **No**

058

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

059

– Put circuit breakers at the front of the processor node in the Off (‘0’) position.
– Reinstall the previously removed component.
– Go to Step 056 on page 1-197 to service next highest priority component.

060

Memory protection error: “memoryProtect”

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

(Step **060** continues)

060 (continued)
Have memory parts been changed recently (since last successful IPL) in this processor node?
Yes **No**

061

Problem may be: base memory card, CPU card, I/O planar, or node supervisor control cable.
– Replace parts, one at a time, until problem is corrected.
Are you able to correct the problem?
Yes **No**

062

Call next level of support.

063

Problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

064

– Check memory card and SIMM part numbers in *Diagnostic Information for Micro Channel Bus Systems* (SA38-0532) and *Adapters, Devices and Cable Information* (SA38-0533) to ensure that they are compatible with the fastest Type 7013 machines.
– If necessary, call next level of support.

MAP 0340: POWER3 SMP Thin and Wide Node Power

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

001

Ensure all circuit breakers for this node (power assembly and 48-volt in-line) are in the ON ('1') position
Is this a wide node (I/O expansion assembly attached and no supervisor card in left side)?
Yes **No**

002

– Go to Step 008.

003

Are the I/O power assembly power interlock bar and tab engaged correctly?
Yes **No**

004

– Reseat the I/O power assembly and ensure the power interlock bar and tab are engaged correctly.
Have the problem symptoms changed?
Yes **No**

005

– Go to Step 008.

006

– Go to "MAP 0130: Processor Node" on page 1-30.

007

– Go to Step 008.

008

– Check the node supervisor card green LED 1.
Is the green LED 1 Off?
Yes **No**

009

Processor node getting 48 V dc power.
Is the node supervisor green LED 1 flashing?
Yes **No**

010

Green LED 1 is On, indicating no problem with power supply.
– Verify that you have the proper processor node, then go to "MAP 0130: Processor Node" on page 1-30.

011

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.

Ensure that the 48-volt power supply cable(s) is connected and the cable circuit breaker is in the ON position.

Is the node supervisor (green) LED #3 ON or flashing (also LED #4 if this is a wide node).

Yes **No**

012

– Go to Step 021 on page 1-202.

013

Processor node is getting power.

– Power on RS/6000 logic from the virtual front panel on the control workstation.

Does green LED 1 light and stay lit?

Yes **No**

014

– Check the front assembly power interlock bar(s) and power interlock tab(s) are engaged properly.

Are the power interlock bar(s) and tab(s) engaged properly?

Yes **No**

015

Engage the front assembly power interlock bar(s) and power interlock tab(s).

– Go to Step 027 on page 1-202.

016

Check for short conditions.

– Go to “MAP 0360: POWER3 SMP Thin and Wide Node Minimum Configuration” on page 1-217.

017

RS/6000 logic getting power.

Does processor node IPL successfully?

Yes **No**

018

Processor node has problem with IPL.

– Go to “MAP 0130: Processor Node” on page 1-30.

019

No problem detected.

(Step **019** continues)

019 (continued)
– Record reason for power-off condition.
– Go to "MAP 0570: End of Call" on page 1-357.

020

– Go to Step 037 on page 1-203.

021

Is the power supplies yellow LED on or flashing?

Yes **No**

022

Verify the CB is On.
– Go to Step 030.

023

+48 V present.

Is the power supplies green power LED flashing?

Yes **No**

024

Is the power supplies green LED on steady?

Yes **No**

025

The LED is Off.
– Exchange the power supply.

026

– Go to "MAP 0570: End of Call" on page 1-357.

027

Switch the CB Off, then On.

Did the green LED light and the node IPL?

Yes **No**

028

– Go to MAP 0330: POWER3 SMP Thin and Wide Node Environment, Step 048 on page 1-196.

029

– Go to "MAP 0570: End of Call" on page 1-357.

030

(Step **030** continues)

030 (continued)
Is the CB switched On?
Yes **No**

031

Set the CB to the On position.
Did the CB switch on and stay on?
Yes **No**

032

Did the CB trip?
Yes **No**

033

– Go to Step 021 on page 1-202.

034

Possible power supply problem or short condition.
– Go to Step 043 on page 1-204.

035

– Go to Step 008 on page 1-200.

036

Node 48 volts missing.
– Go to MAP 0330: POWER3 SMP Thin and Wide Node Environment, Step 017 on page 1-192.

037

Check the node supervisor card yellow LED 5.
Is the yellow LED 5 Off?
Yes **No**

038

Base code loaded on node supervisor card.
– Go to "Updating the Node Supervisor Code" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 050 on page 1-205.

039

– Check the power supplies green LED.
Is the power supplies green LED Off?
Yes **No**

040

– Go to MAP 0330: POWER3 SMP Thin and Wide Node Environment, Step 014 on page 1-192.

041

– Check circuit breaker(s) at front of power supplies. Put these circuit breaker(s) in the On ('1') position if they are not already.

Do the circuit breakers go (trip) to the Off ('0') position?

Yes **No**

042

– Go to Step 050 on page 1-205.

043

– Place processor node in service position.

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.

– Check the 48-volt bulk power harnesses at power supplies in the rear of the node, at the connection to the circuit breakers, and at the 48-volt bulk power connections for any obvious problems which might cause a short.

Does everything appear to be okay?

Yes **No**

044

– Fix obvious problem(s).
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Go to Step 041.

045

– Using a multimeter, check for a short between the pins of the 48-volt input connector(s) (J8 at the rear of the node).

Was a shorted condition detected?

Yes **No**

046

– Disconnect the 48-volt power cable(s) from the SEPBU bulkhead.
– Using a multimeter, check for a short between pins in the 48-volt power cable(s).
– Using a multimeter, check for a short between any pins in node power plug(s).
– If a short is detected, replace the 48-volt power cable.
– Using a multimeter, check for a short between any tabs in circuit breaker(s).
– If a short is detected, isolate it to either the cable or circuit breaker and replace the corresponding part.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Go to Step 041.

047

– Using a multimeter, check for a short between the pins of the power/supervisor connector at the rear of the front assembly.

(Step **047** continues)

047 (continued)
Was a shorted condition detected?
Yes **No**

048

– Replace the power/supervisor cable assembly in the logic part of the node.
– Remove processor node from service position.
– Reconnect all cables at rear of processor node.
– Go to Step 041 on page 1-204.

049

– Replace corresponding power supply.
– Remove processor node from service position.
– Reconnect all cables at rear of processor node.
– Go to Step 041 on page 1-204.

050

– From control workstation or processor node, check node supervisor green LED 1 for this node.
Is node supervisor green LED 1 off or is 'No Power to Node' displayed on the control workstation?
Yes **No**

051

Processor node problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

052

– Check processor node(s) on any other dc power harness for any that are powered on. Ensure that the other processor node has its circuit breaker in the On ('1') position.
– Check the green LED 1 for an On or Flashing condition.
– POWER3 SMP processor nodes receive 48-volt power by connecting a power cable between the node and the SEPBU bulkhead.

```
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
```

Is the green LED 1 on any other processor node On or Flashing?
Yes **No**

053

– Go to "MAP 0370: Main Power" on page 1-222.

054

– Check all other processor nodes on the same dc power harness as the failing processor node to check for the same symptom - circuit breaker on but green LED 1 not lit.
(Step **054** continues)

054 (continued)

Is this the only processor node showing this symptom?

Yes **No**

055

Problem with 48 V dc power distribution.

– Go to "MAP 0480: Open in 48 V dc Distribution" on page 1-283.

056

– Check the cable connections at the rear of the processor node and at the 48-volt power distribution connection.

Is there a good connection?

Yes **No**

057

– Fix cable connection problem.

– Go to Step 050 on page 1-205.

058

– Put the circuit breakers in the 48-volt input cable in the "on" (1) position.

– Check for 48 volts present at the POWER3 SMP processor node end of the input cable(s). Measure between the voltage and the return pins.

Is there 48 volts present at the connector(s)?

Yes **No**

059

Voltage is missing at the input cable(s).

– Replace the 48-volt input cable(s).

Is 48 volts still missing at the connector end?

Yes **No**

060

– Go to Step 062.

061

– Go to "MAP 0480: Open in 48 V dc Distribution" on page 1-283.

062

48 volts distribution is getting to node.

– Check power supply green LED(s) and running fans.

Are the power supply green LED(s) On and fans running?

Yes **No**

063

– Go to MAP 0330: POWER3 SMP Thin and Wide Node Environment, Step 014 on page 1-192.

064

(Step **064** continues)

064 (continued)
– Go to Step 008 on page 1-200.

MAP 0350: POWER3 SMP Thin and Wide Node Control

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 High Performance Switch (HiPS) feature or Scalable POWERparallel Switch (SPS) 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.

Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.

Refer to "Viewing Switch Partitions" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for locating and fencing/unfencing nodes within a switch partition.

001

Processor node problem detected by customer or CE.
– Use the following table to continue service:

Condition	Action
• Problem with node power	Go to “MAP 0330: POWER3 SMP Thin and Wide Node Environment” on page 1-191.
• Node will not reset	Go to Step 002.
• No response from TTY console	• Close existing TTY window and open another. • Go to Step 019 on page 1-211.
• Yellow or green LEDs on node will not light.	Go to Step 039 on page 1-215.

002

Node will not reset.
– Check with customer to make sure this processor node is not in the current active configuration. If processor node is *not* operational and actively working at this time, continue service. If it *is* operational and actively working, schedule a time convenient for the customer.
– From the control workstation, open the node front panel display.
– Issue reset for this processor node.

Does processor node reset?

Yes **No**

003

Problem with reset.
– Go to Step 007 on page 1-209.

004

Intermittent problem may be occurring.
– Please record following:

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

– Check logs to see if this fault has been previously recorded.
Is this a recurring fault?
Yes **No**

005

This is not a recurring fault.
– Go to "MAP 0570: End of Call" on page 1-357.

006

Reoccurrence of intermittent fault has been detected.
– Treat this fault as a solid failure.
– Go to Step 017 on page 1-210.

007

– From the control workstation node front panel display:

- Shutdown and power-off processor node.
- Power-on processor node.
- Check LCDs for sequence indicating IPL.

Do the LCDs change?
Yes **No**

008

Node supervisor card not responding to commands.
– Go to "MAP 0110: Supervisor Subsystem" on page 1-10.

009

Processor node is IPLing.
Do LCDs eventually indicate completion of IPL sequence (i.e. blank or "uuu")?
Yes **No**

010

Processor node has problem IPLing.
– Go to Step 008 on page 1-88 to continue service.

011

– From node front panel display, click on "TTY" button to open a TTY console.
– From the TTY console:

- Select "Advanced Diagnostic Routines"

(Step **011** continues)

011 (continued)

- Select “System Verification”
- Select “Base System”.

Does this test indicate a failure?

Yes **No**

012

– From the control workstation, reset this processor node.

Does processor node reset?

Yes **No**

013

Problem with reset.

– Go to Step 017 to continue isolation.

014

Node reset functioning properly.

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

Yes **No**

015

This is an intermittent problem.

– Please record following tracking information:

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

– Go to “MAP 0570: End of Call” on page 1-357.

016

Problem resolved.

– Go to “MAP 0570: End of Call” on page 1-357.

017

Problem with reset.

– From the control workstation, power off processor node.

– Place processor node in service position.

– Use the following prioritized table to continue service:

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 018 on page 1-211 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 018 on page 1-211 to verify fix.
3	I/O Planar Board	1. Replace board. 2. Go to Step 018 on page 1-211 to verify fix.
4	All replaced	Call next level of support.

018

Component has been repaired or replaced.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– Put the circuit breaker at the front of the processor node in the On (‘1’) position.
– Go to Step 009 on page 1-209 to continue service.

019

No response from TTY console for a processor node.
– From system file server, telnet into this processor node:

telnet *nodename*

– Log in as “root”.
– Have the customer check to make sure that the TTY port on the processor node is correctly defined.

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

   smit console

   Use the menu options to check and/or 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.
2. Check the TTY configuration by issuing the following command in the processor node's window:

   smit tty

   Use the menu options to check and/or reconfigure the “s1” TTY port as required. The proper TTY parameters are listed in *IBM RS/6000 SP: Administration Guide*.

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

Yes **No**

020

TTY not responding due to customer configuration.
– Customer must configure these parameters.
– Go to “MAP 0570: End of Call” on page 1-357.

021

(Step **021** continues)

021 (continued)
Problem due to hardware.
– Close console TTY window (if already open).
– Log into the node over the Ethernet:

telnet *nodename*

– Enter the following command:

chcons /dev/tty1
– Use **diag** command to run regular (not advanced) diagnostics on "TTY0".
Do the diagnostics pass (no problem found)?
Yes **No**

022

– Run wrap diagnostics on S1 to node supervisor cable.
Do diagnostics fail?
Yes **No**

023

– Go to Step 027.

024

– Run wrap diagnostics on S1.
Do diagnostics pass (no trouble found)?
Yes **No**

025

– Replace I/O planar board.
– Go to Step 028 on page 1-213.

026

– Go to Step 027.

027

– Log into the node over the Ethernet:

telnet *nodename*

– Enter the following command:

chcons /dev/tty0
– From the control workstation, make sure the node front panel display is open.
– Close TTY console at this time.
– Have the customer remove the processor node from the active system configuration and power off the processor node.
– Put the circuit breaker at the front of the processor node in the Off ('0') position.
– Place processor node in service position.
– Refer to the following table for priority of replacement or repair of components.

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 028 on page 1-213 to verify fix.
2	I/O planar	1. Replace I/O planar. 2. Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 3. Go to Step 028 on page 1-213 to verify fix.
3	Cables between frame supervisor and node supervisor card	1. Replace cable. 2. Go to Step 028 on page 1-213 to verify fix.
4	All replaced	Call next level of support.

028

Component has been repaired or replaced.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– As processor node completes IPL, check the TTY console window.
– From the control workstation node front panel display, put the processor node in SERVICE mode.
– Put the circuit breaker at the front of the processor node in the On (‘1’) position.

Do you get any data on the TTY console screen?

Yes **No**

029

– Go to Step 027 on page 1-212 to service next highest priority component.

030

Processor node IPLed in SERVICE mode.
– From the TTY console:

- Select “Advanced Diagnostic Routines”
- Select “System Verification”
- Select “Base System”

Does processor node pass all diagnostics?

Yes **No**

031

– Repair problem as indicated by diagnostics. Use “MAP 0130: Processor Node” on page 1-30 as necessary.

032

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

033

(Step **033** continues)

033 (continued)
LCD problem.
– Have the customer remove the processor node from the active system configuration and power off the processor node.
– Put the circuit breaker at the front of the processor node in the Off ('0') position.
– Place processor node in service position.
– Refer to the following table for priority of replacement or repair of components.

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 034 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 034 to verify fix.
3	I/O Planar Board	1. Replace board. 2. Go to Step 034 to verify fix.
4	All Replaced	Call next level of support.

034

Component has been repaired or replaced.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
– From the control workstation, power on this processor node.
– From the control workstation, make sure the LCDs for this processor node are displayed on the screen.
– Check the LCDs for the IPL sequence.

Do the LCDs indicate the IPL sequence?

Yes **No**

035

– Go to Step 033 on page 1-213 to service next highest priority component.

036

– From the TTY console:

- Select "Advanced Diagnostic Routines"
- Select "System Verification"
- Select "Base System"

Does processor node pass all diagnostics?

Yes **No**

037

– Repair problem as indicated by diagnostics. Use "MAP 0130: Processor Node" on page 1-30 as necessary.

038

(Step **038** continues)

038 (continued)
Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

039

Yellow or green LED on node supervisor is not functioning.
– Have the customer remove the processor node from the active system configuration and power off the processor node.
– Put the circuit breakers at the front of the processor node in the Off (‘0’) position.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, ignoring PASS/FAIL results.
– Check yellow and green LEDs on the node supervisor card to see if each LED lights at some point.

Does each of the eight LEDs light at any time?

Yes

No

040

– Place processor node in service position.
– Repeat "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Check to see if same color LED is always Off in front and rear.

Are LEDs of same color always Off in rear?

Yes

No

041

– Replace LED display card.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Do both LEDs light at any time?

Yes

No

042

– Go to Step 044.

043

Problem resolved.
– Go to Step 045.

044

– Replace the node supervisor card.
– Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to verify replacement.
– Go to Step 045.

045

All LEDs are operating.
– Remove processor node from service position.
– Reconnect all cables at rear of the processor node.
(Step **045** continues)

045 (continued)
– Go to “MAP 0570: End of Call” on page 1-357.

MAP 0360: POWER3 SMP Thin and Wide Node Minimum Configuration

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

001

Check if this POWER3 SMP node is a thin node or a wide node (thin node with an *I/O expansion chassis*.
Is this a wide node?

Yes **No**

002

The problem exists in the thin node.
– Go to Step 012 on page 1-218 to test the thin node minimum configuration.

003

Split the thin node and I/O expansion assembly.
– Shutdown the node.
– Set the circuit breakers to the Off (‘0’) position.
– Remove the I/O expansion control cable from J2 on the I/O planar.
– Remove 4 screws that secure the CPU chassis to the I/O expansion chassis, then separate the chassis.
– Remove the DASD cable (4-drop) from the I/O expansion assembly DASD.
– Unplug and reseat the node supervisor cable to recognize the new thin node configuration.
– IPL the thin node.

Does the node IPL properly?

Yes **No**

004

The problem exists in the thin node.
– Go to Step 012 on page 1-218 to test the thin node minimum configuration.

005

Remove the following components in the I/O expansion chassis bringing it to the minimum configuration:

Record the slot numbers of the PCI adapters. Label and record the location of any cables attached to the adapters. Remove all the PCI adapters.

(Step **005** continues)

005 (continued)
– Reconnect the I/O expansion and CPU chassis, then secure the chassis with 4 screws.
– Reconnect the I/O expansion control cable to J2 on the I/O planar.
– Reseat the node supervisor by unplugging, then plugging, the supervisor cable at the rear of the node.
– Set the circuit breaker to the On ('|') position.

Does the node IPL properly?

Yes **No**

006

A problem exists in the I/O expansion chassis.
– Go to Step 021 on page 1-220 to test the wide node minimum configuration.

007

Add the components removed in Step 005 on page 1-217, one at a time, and IPL the node.

Does the node IPL properly?

Yes **No**

008

Component failed.
– Replace failing component and IPL the node.

Does the node IPL properly?

Yes **No**

009

Component failed.
– Replace failing component.
– Go to Step 008

010

Component is working correctly.
– Go to Step 007 to add another component. If all components have been installed, go to "MAP 0570: End of Call" on page 1-357.

011

Component is working correctly.
– Go to Step 007 to add another component. If all components have been installed, go to "MAP 0570: End of Call" on page 1-357.

012

Remove the following components, if they exist, in the thin node bringing it to the minimum configuration:
– Record the slot numbers of the PCI adapters, label and record the location of any cables attached to the adapters, then remove all the PCI adapters.
– Remove the SPS MX2 adapter card from slot J9.
– Remove one memory card (if there are two).
– Remove the DIMMs from the remaining card except for the DIMMs in locations J1 and J2. (For POWER3 SMP thin and wide node memory card - DIMM locations, refer to "Location Diagrams of the RS/6000 SP Components" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.)

(Step **012** continues)

012 (continued)
– Remove CPU card 2, if installed.
– Remove all DASD except for the boot DASD (hdisk0).
– Reseat the node supervisor card.
– Set the circuit breaker to the On ('|') position.

Does the node IPL properly?

Yes **No**

013

Replace the following components, one at a time, and IPL the node.

Memory DIMM
Memory card
CPU card
Service processor card
Boot DASD
DASD cable (2-drop or 4-drop)
I/O planar
System planar
Flat ribbon power cable

Does the node IPL properly?

Yes **No**

014

– Replace next component in list on Step 013.
– If all components have been replaced, call next level of support.

015

Last component replaced was defective.
– Go to Step 016.

016

Add the components removed in Step 012 on page 1-218, one at a time, and IPL the node.

Does the node IPL properly?

Yes **No**

017

Component failed.
– Replace failing component and IPL the node.

Does the node IPL properly?

Yes **No**

018

Component failed.
– Replace failing component.
– Go to Step 017

019

(Step **019** continues)

019 (continued)
Component is working correctly.
– Go to Step 016 on page 1-219 to add another component. If all components have been installed, go to "MAP 0570: End of Call" on page 1-357.

020

Component is working correctly.
– Go to Step 016 on page 1-219 to add another component. If all components have been installed, go to "MAP 0570: End of Call" on page 1-357.

021

Run minimum configuration on the wide node (minimum configured I/O expansion chassis and a thin node that IPLs correctly).
– Replace the I/O expansion control cable and IPL the node.
Does the IPL fail?
Yes **No**

022

Add components (removed in Step 005 on page 1-217), one at a time, in the following order and IPL the node:

PCI adapters (one at a time), if applicable
Reconnect the DASD cable (4-drop) to the front of the I/O expansion assembly DASD.
DASD (one at a time), if applicable.

Did the node IPL properly?
Yes **No**

023

Component failed.
– Replace failed component and IPL.
Did node IPL properly?
Yes **No**

024

Component failed.
– Replace failed component.
– Go to Step 023.

025

– Go to Step 022.

026

Component working correctly.
– Go to Step 022.
– If all components are installed, go to "MAP 0570: End of Call" on page 1-357.

027

(Step **027** continues)

027 (continued)

– Replace the PCI expansion planar and IPL the node.

Does the IPL fail?

Yes **No**

028

– Go to Step 022 on page 1-220.

029

Replace the interposer adapter cable.

Does the IPL fail?

Yes **No**

030

Go to Step 022 on page 1-220.

031

– Replace the interposer adapter card.

Does the IPL fail?

Yes **No**

032

Go to Step 022 on page 1-220.

033

Replace the power assembly.

Does the IPL fail?

Yes **No**

034

Go to Step 022 on page 1-220.

035

– Call next level of support.

MAP 0370: Main Power

The dc frame power is supplied by ac-dc power supplies in the base of each frame. There are two different implementations of the frame power.

Power Distribution Unit (PDU):

- Used in SP1 and some SP2 systems
- Converts 200-240 V ac to +12, +24, and +48 V dc
- The +24 V dc supply is used to power an EPO contactor
- The main power switch acts as EPO switch
- Uses 4 bulk power supplies to provide N+1 +48 V dc power
- Uses many discrete components for power conversion, distribution, and control functions
- Requires external transformer for use with 380-415 V ac
- Power for bulk supplies is controlled individually for each supply by the System Monitor.

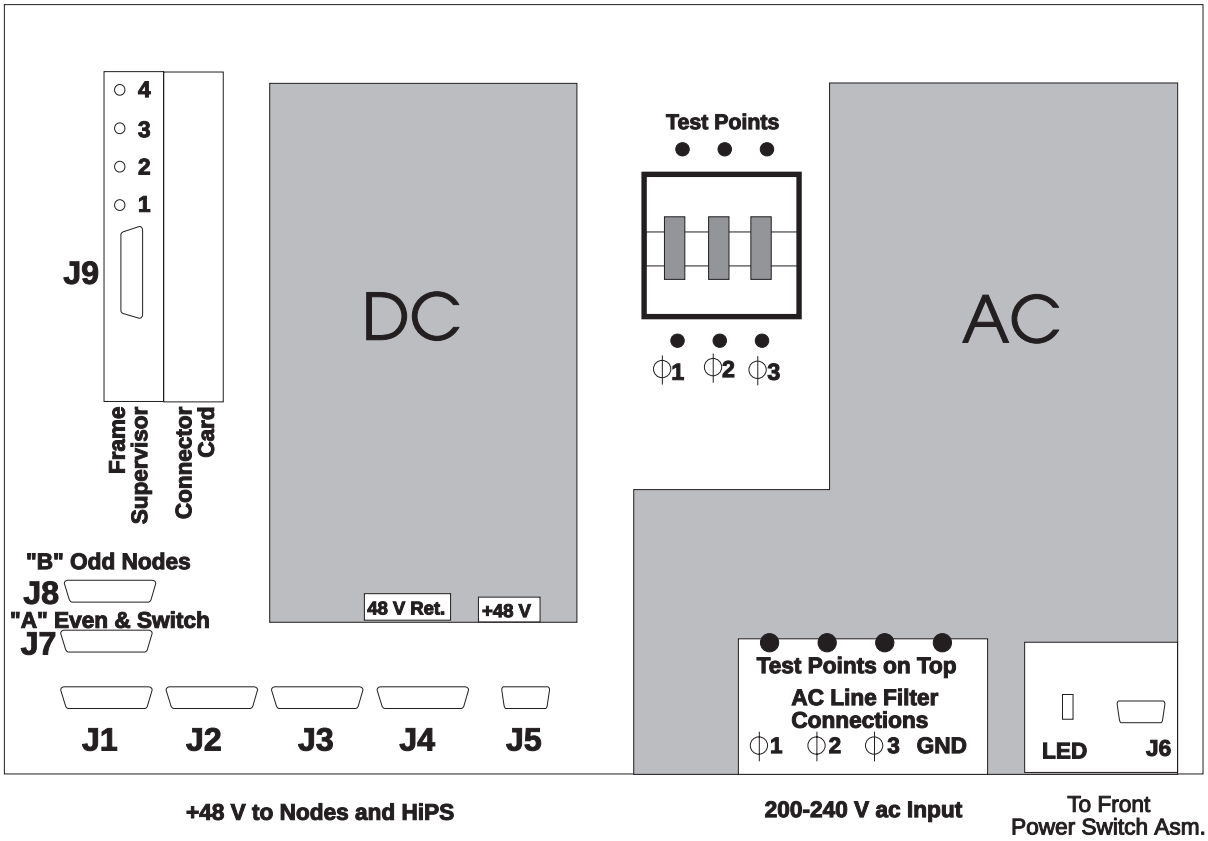

Figure 1-17. Rear View of Power Distribution Unit

Scalable Electrical Power Base Unit (SEPBU):

- Used in SP2 systems
- Converts 200-240 V ac and 380-415 V ac to +12 and +48 V dc without manual intervention
- Uses three bulk power modules to provide N+1, +12, and +48 V dc power
- Uses power modules and power chassis backplane for power conversion, distribution, and control functions
- The LC8 has only one power module (in position D — see Figure 1-19 on page 1-223) and optionally one additional power module in position C.
- No external transformer required

- Has no mainline circuit breaker (power modules contain individual circuit breakers)
- Has quick disconnect ac power connector
- The main power switch acts as EPO switch and also sends a signal to the PCI indicating that the power switch is closed
- Provides power control interface (PCI) function
- All power modules are controlled with one power switch by the System Monitor.

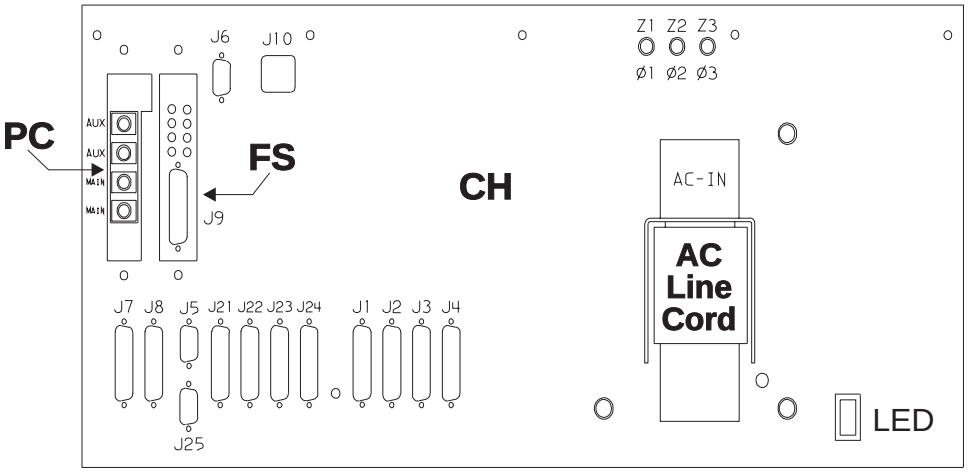

Figure 1-18. Rear View of Scalable Electrical Power Base Unit

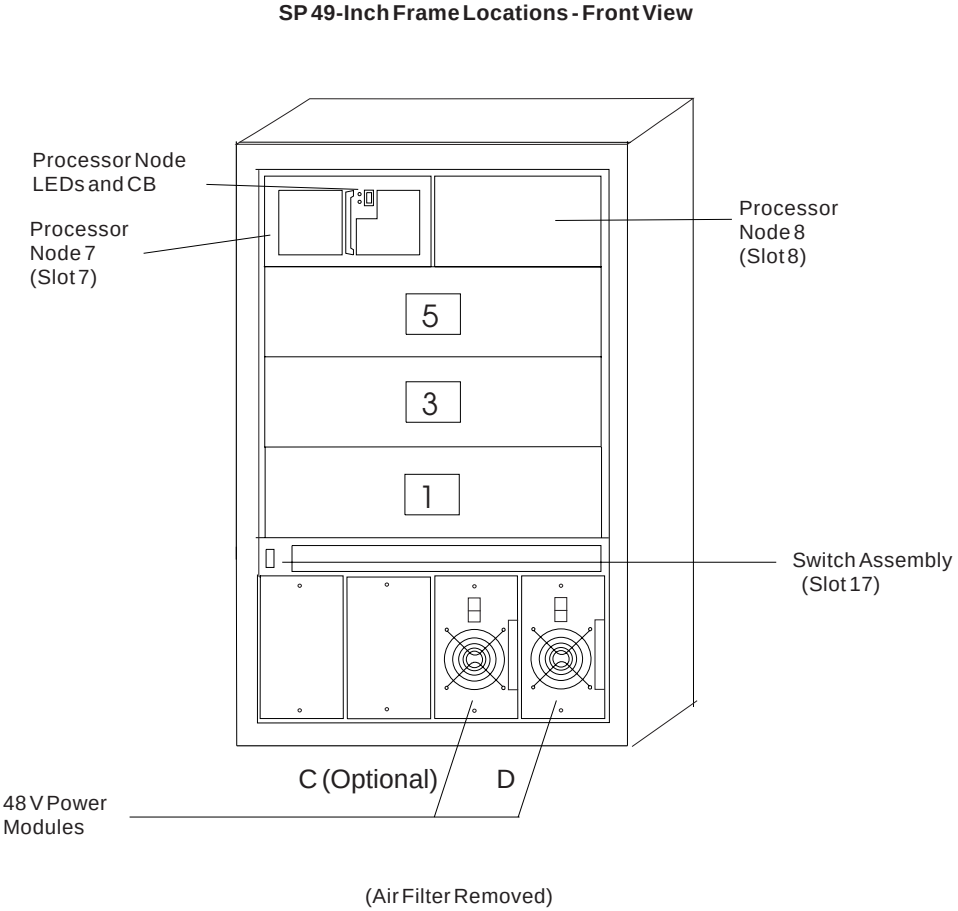

Figure 1-19. Front View of 49-Inch Frame Locations

Common to PDU and SEPBU:

- Provides supervisor +12 V dc power
- Provides +48 V dc power for processor node(s) and/or switch assemblies (usually N+1 configuration)
- Houses frame supervisor for frame control/monitoring
- Common connectors at bulkhead
- The +48 V dc power can be controlled via frame supervisor.

DANGER

Both the SEPBU power chassis and the PDU 48 V 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.

001

Problem detected concerning power in frame.

Attention: When servicing frame(s) in a parallel environment, powering off a frame will cause all parallel jobs to terminate. The switch network can not be re-initialized until power is restored to the frame, or the frame is removed from the active configuration in a multi-frame system. Refer to "Removing and Restoring Switch Resources" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, for these procedures.

Note: PDU is an acronym for Power Distribution Unit. SEPBU is an acronym for Scalable Electrical Power Base Unit.

– Use the following table to continue service.

Frame Power Type	Action
PDU	Go to “MAP 0380: Power Distribution Unit (PDU)” on page 1-225.
SEPBU	Go to “MAP 0460: Scalable Electrical Power Base Unit (SEPBU)” on page 1-265.

MAP 0380: Power Distribution Unit (PDU)

The 48 V dc power system consists of the following components:

- ac line cord
- ac line filter
- Main circuit breaker
- Contactor
- 48 V Power chassis
- Bulk dc power supplies
- Busbars
- 48 V dc distribution cables
- Miscellaneous cables.

The supervisor 12/24 V dc power system consists of the following components:

- Supervisor 12 V dc power supply (S1)
- Contactor main power switch 24 V dc power supply (S2)
- PDU rear panel LED
- Main power switch LED
- Connector card
- Supervisor harnesses
- Miscellaneous cables.

Refer to the following two figures:

- Figure 1-20 on page 1-226, for a view of the RS/6000 SP frame power diagram
- Figure 1-21 on page 1-228, for a view of the ac wiring diagram for the RS/6000 SP power distribution unit.

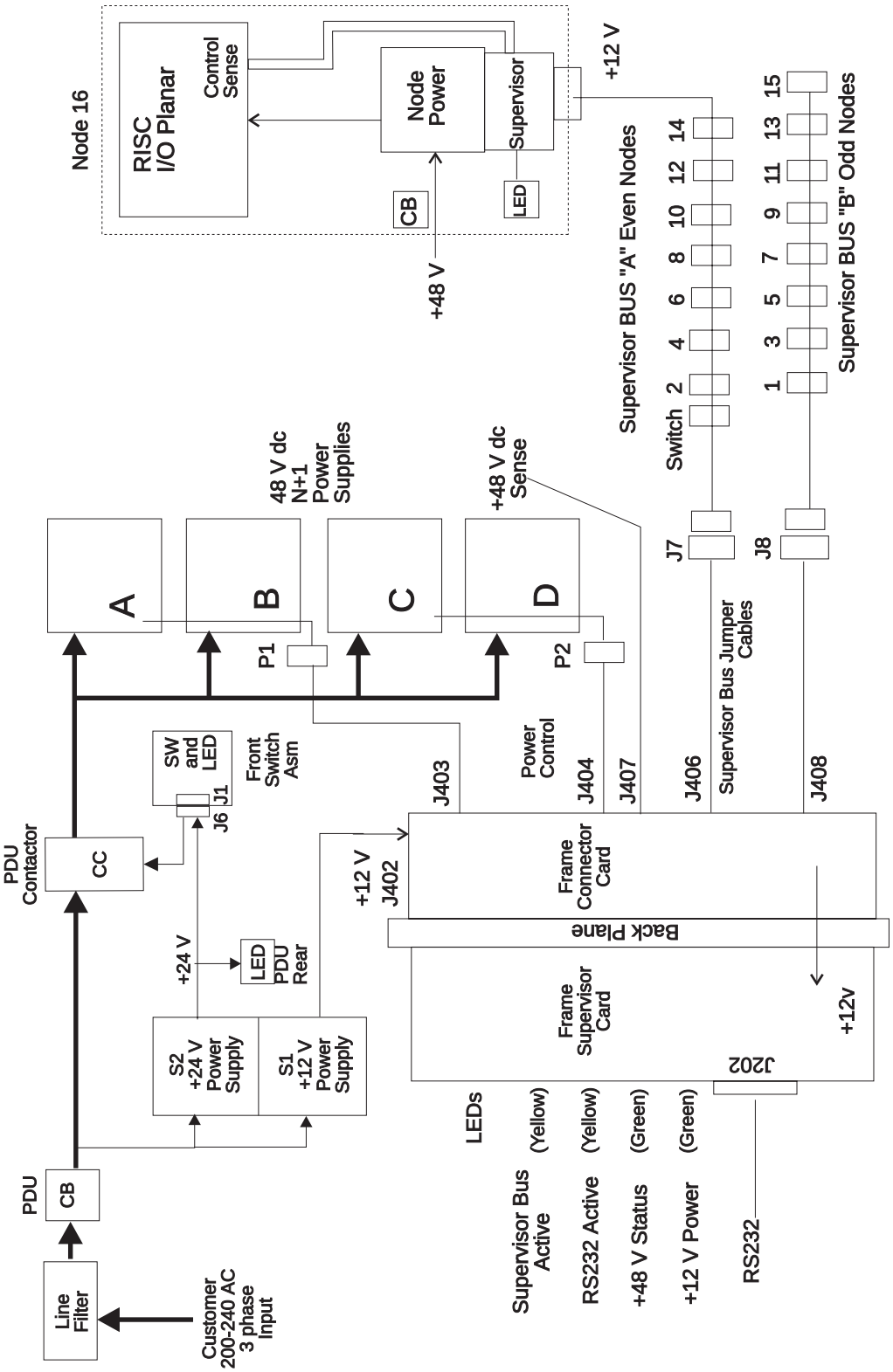

Figure 1-20. RS/6000 SP PDU Power Diagram

001

(Step **001** continues)

001 (continued)
Problem detected concerning power in frame.

Attention: When servicing frame(s) in a parallel environment, powering off a frame will cause all parallel jobs to terminate. The switch network can not be re-initialized until power is restored to the frame, or the frame is removed from the active configuration in a multi-frame system. Refer to "Removing and Restoring Switch Resources" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, for these procedures.

Note: PDU is an acronym for Power Distribution Unit.

– Check the condition of the following LEDs:
  - Main power switch LED
  - PDU panel LED
  - Frame supervisor LEDs.

– The following table contains a prioritized list of conditions.

  Find the first condition that describes your problem, then perform the suggested action:

  Note: The system monitor log can be viewed by issuing the following command:

  errpt -a -N sphwlog | pg

  on the control workstation.

Priority	Condition	Action
1	Main power switch LED is Off -AND- PDU rear panel LED is Off -AND- Frame Supervisor LEDs are Off.	Go to “MAP 0390: Supervisor Power Problem” on page 1-229.
2	Main power switch LED is On -OR- PDU rear panel LED is On, -BUT- all frame supervisor LEDs are Off.	Go to “MAP 0400: Supervisor Power 12 V dc Problem” on page 1-237.
3	Main power switch LED is On -AND- PDU rear panel LED is Off, -BUT- some frame supervisor LEDs are On.	Go to “MAP 0410: Supervisor Power 24 V dc Problem” on page 1-244.
4	Main power switch LED is Off.	Go to “MAP 0420: Main Power Switch” on page 1-247.
5	System monitor log reports “dc Power Loss“ for any bulk dc power supplies.	Go to “MAP 0430: dc Power Loss from Bulk dc Power Supply(s)” on page 1-250.
6	Frame supervisor detecting problem: • Frame supervisor green LED #2 (dc OK) is flashing. • Frame temperature is over 40° C.	Go to “MAP 0450: Frame Environment” on page 1-262.
7	Problem with 48 V dc power distribution to processor node(s) or switch assemblies.	Go to “MAP 0480: Open in 48 V dc Distribution” on page 1-283.

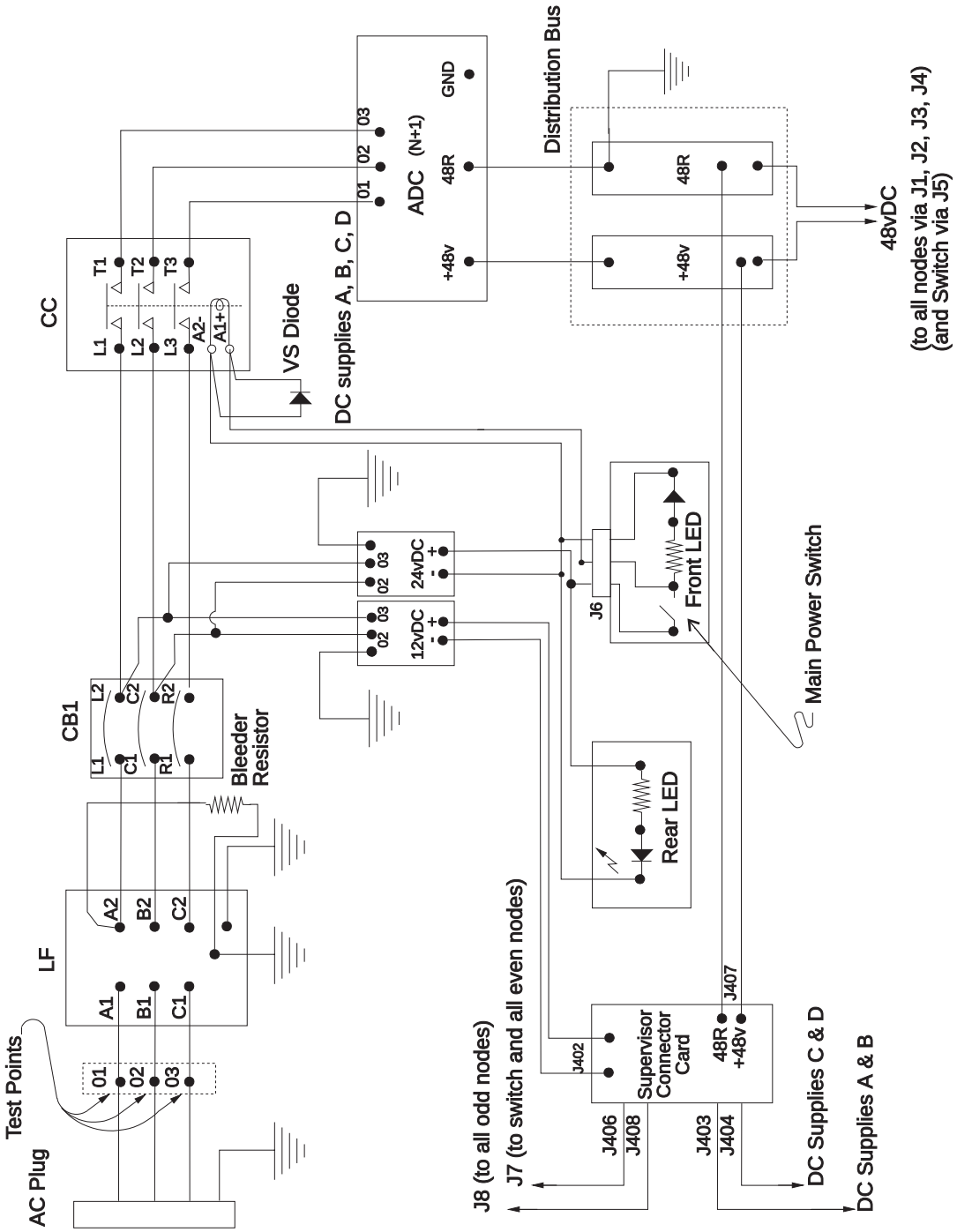

Figure 1-21. Wiring Diagram of RS/6000 SP Power Distribution Unit

MAP 0390: Supervisor Power Problem

Problem detected concerning power in system:

- Main power switch LED is Off
- -AND- PDU rear panel LED is Off
- -AND- Frame Supervisor LEDs are Off.

001

– Put main power switch in the Off (‘0’) position.

DANGER

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

– Using a multimeter, check ac phase-to-phase voltage between test points O1 and O2 on ac filter. The voltage should be in the range 180-254 V ac.

Is there an ac power problem, i.e., ac voltage not in range?

Yes **No**

002

– Go to Step 033 on page 1-233.

003

Problem with the power coming into the frame.

– Put the RS/6000 SP main circuit breaker in the Off (‘0’) position.

Is there a high-voltage transformer connected to this frame?

Yes **No**

004

– Have customer put his wall circuit breaker in the On position.

– Check the state of the customer circuit breaker.

Does the customer circuit breaker stay in the On position?

Yes **No**

005

DANGER

High voltage present. Perform “Lockout/Tagout Procedure for PDU” on page 1-2 or “Lockout/Bagout Procedure for PDU” on page 1-3 to remove primary power to the frame.

– With power removed, check for a short condition between ac phases using test points 01, 02, and 03 on ac filter.

Do you detect a short condition?

Yes **No**

006

– Call next level of support.

007

– Isolate ac short between line filter and circuit breaker input using Figure 1-21 on page 1-228 as a reference.
– Replace parts as required.
– Go to Step 051 on page 1-236 to verify fix.

008

– Go to Step 010

009

– Go to Step 017 on page 1-231

010

– Repeat the ac voltage test from Step 001 on page 1-229.

Is ac present and within 180-254 V ac?

Yes **No**

011

DANGER

High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove primary power to the frame (and high-voltage transformer, if present).

– Have customer check the ac voltage at the customer's receptacle or other power connection for ac voltage within 180-254 V ac.

Is customer's ac present and within 180-254 V ac?

Yes **No**

012

Problem with customer ac power.
– Have customer correct problem.
– Go to "MAP 0570: End of Call" on page 1-357.

013

– With power removed, replace the ac line cord.
– Go to Step 049 on page 1-236 to verify fix.

014

ac voltage present at frame input.

(Step **014** continues)

014 (continued)
Is this the first time at this step?
Yes **No**

015

– Go to Step 051 on page 1-236.

016

– Go to Step 033 on page 1-233 to continue fault isolation.

017

DANGER

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

– Open the service access cover of the high-voltage transformer.
– Using a multimeter, check ac phase-to-phase voltage between test points H0 and H1 on the high-voltage transformer.

Is ac present and within 340-440 V ac?
Yes **No**

018

– Put both circuit breakers of high-voltage transformer in the Off ('0') position.
– Have customer put his wall circuit breaker in the On position.

Does the customer circuit breaker stay in the On position?
Yes **No**

019

DANGER

High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove primary power to the frame (and high-voltage transformer, if present).

– Replace the ac power cord connecting the high-voltage transformer to the customer's power.
– Go to Step 049 on page 1-236 to verify fix.

020

DANGER

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

– Put input circuit breaker of the high-voltage transformer in the On ('1') position.
– Using a multimeter, check ac phase-to-phase voltage between test points H0 and H1 on the high-voltage transformer.

(Step **020** continues)

020 (continued)
Is ac present and within 340-440 V ac?
Yes **No**

021

DANGER

High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove primary power to the frame (and high-voltage transformer, if present).

– Replace high-voltage transformer and power cable connecting the high-voltage transformer to the customer's power.
– Go to Step 049 on page 1-236 to verify fix.

022

– Go to Step 024.

023

– Go to Step 024.

024

DANGER

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

– Put output circuit breaker of the high-voltage transformer in the On ('1') position.
– Using a multimeter, check ac phase-to-phase voltage between test points O1 and O2 on ac filter.
Is ac present and within 180-254 V ac?
Yes **No**

025

Problem with the power not coming into frame.

DANGER

High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove primary power to the frame (and high-voltage transformer, if present).

– Disconnect RS/6000 SP ac line cord from the high-voltage transformer.
– Using a multimeter, check continuity of the ac line cord from the plug to the test points on the ac filter.
(Step **025** continues)

025 (continued)

Is there continuity on all three phases?

Yes **No**

026

– Replace the ac line cord.
– Go to Step 049 on page 1-236 to verify fix.

027

– Using a multimeter, check for a short condition between the three test points (O1, O2, and O3) on the ac filter.

Is there a short condition between the test points?

Yes **No**

028

– Replace the high-voltage transformer.
– Go to Step 049 on page 1-236 to verify fix.

029

– Detach ac line cord from ac filter.
– Check for a short condition on the ac line cord.

Is there a short condition on the ac line cord?

Yes **No**

030

– Go to Step 033.

031

– Replace the ac line cord.
– Go to Step 049 on page 1-236 to verify fix.

032

– Go to Step 033.

033

Problem in Power Distribution Unit section.

DANGER

> **High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove primary power to the frame (and high-voltage transformer if present).**

– Open Power Distribution ac section.
– Check for an obvious problem with the following ac cables to the 12/24 V supervisor power supplies which might be causing a short or open condition.

PDU-CB-L2 to PDU-S1-L1

(Step **033** continues)

033 (continued)

PDU-CB-C2 to PDU-S1-L2/N
PDU-CB-L2 to PDU-S2-L1
PDU-CB-C2 to PDU-S2-L2/N

– Check for a short condition between the following points:

PDU-CB-L2 to PDU-CB-C2
PDU-CB-L2 to PDU-CB-R2
PDU-CB-C2 to PDU-CC-R2
ADC-TB-01 to ADC-TB-02
ADC-TB-01 to ADC-TB-03
ADC-TB-02 to ADC-TB-03

Do the cables appear to be okay?

Yes **No**

034

– Fix the obvious cable problem.
– Go to Step 051 on page 1-236 to verify fix.

035

– With power removed, put main circuit breaker in On (‘1’) position.
– Check continuity of the three phases between ac filter and the circuit breaker output using the following test points:

- **ac filter O1** to **top left of main circuit breaker**
- **ac filter O2** to **top center of main circuit breaker**
- **ac filter O3** to **top right of main circuit breaker**

Is there continuity on all three phases?

Yes **No**

036

– Check continuity across main circuit breaker on all three phases. This is done by checking continuity between corresponding **test points directly above** to **test points directly below the main circuit breaker**.

Is there continuity on all three phases across circuit breaker?

Yes **No**

037

– Replace main circuit breaker.
– Go to Step 049 on page 1-236 to verify fix.

038

– Check continuity of the three phases from the ac filter to the circuit breaker input using the following test points:

- **ac filter O1** to **top left of main circuit breaker**
- **ac filter O2** to **top center of main circuit breaker**
- **ac filter O3** to **top right of main circuit breaker**

(Step **038** continues)

038 (continued)
Is there continuity on all three phases?
Yes **No**

039

– Replace ac filter.
– Go to Step 049 on page 1-236 to verify fix.

040

– Go to Step 033 on page 1-233.

041

– Go to Step 042

042

Is this an SP1 frame?
Yes **No**

043

– Check cable connections at circuit breaker and supervisor power supplies for any loose connections.
Does there appear to be any loose connections?
Yes **No**

044

– Replace cable PDU-CB-L2.
Is this your first time at this step?
Yes **No**

045

– Replace supervisor power supply.
– Go to Step 049 on page 1-236 to verify fix.

046

– Go to Step 049 on page 1-236 to verify fix.

047

– Fix connections.
– Go to Step 049 on page 1-236.

048

–

Consult *9076 SP1 Maintenance Information* for SP1-specific procedures.

049

– Make sure that all circuit breakers feeding power to this frame are in the On (‘1’) position. This includes the customer's circuit breaker, the circuit breaker for the frame, and the circuit breakers on the high-voltage transformer (if present).
– Once all circuit breakers have been put in the On ('1) position, verify that they have all stayed in the On (‘1’) position.

Do all circuit breakers stay in the ('On') position.

Yes **No**

050

Problem not resolved.
– Restart this MAP at Step 001 on page 1-229.

051

No apparent shorts to 12/24 V supervisor power supplies in this frame.
– Check the Power Distribution Unit rear panel LED and the frame supervisor LEDs for any LEDs that are lit.

Are the Power Distribution Unit rear panel LED or any frame supervisor LEDs lit?

Yes **No**

052

Problem not resolved.
– Go to Step 001 on page 1-229.

053

Supervisor power problem resolved.
– Reinstall service access cover on the high-voltage transformer (if present).
– Put main power switch on the On (‘1’) position.
– Check the PDU rear panel LED and the frame supervisor LEDs for any LEDs that are lit.

Are the PDU rear panel LED or any frame supervisor LEDs lit?

Yes **No**

054

– Isolate short between contactor T1, T2, T3 and 48 V power chassis 01, 02, and 03.
– Replace parts as required.
– Go to Step 051 to verify fix.

055

Problem resolved.
– Reinstall PDU access cover(s).
– Go to “MAP 0570: End of Call” on page 1-357.

MAP 0400: Supervisor Power 12 V dc Problem

Problem detected with supervisor power supply 12 V dc:

- Main power switch LED is On
- -OR- PDU rear panel LED is On
- -BUT- all frame supervisor LEDs are Off.

Refer to Figure 1-22, for a diagram of the RS/6000 SP +12 V dc supervisor power.

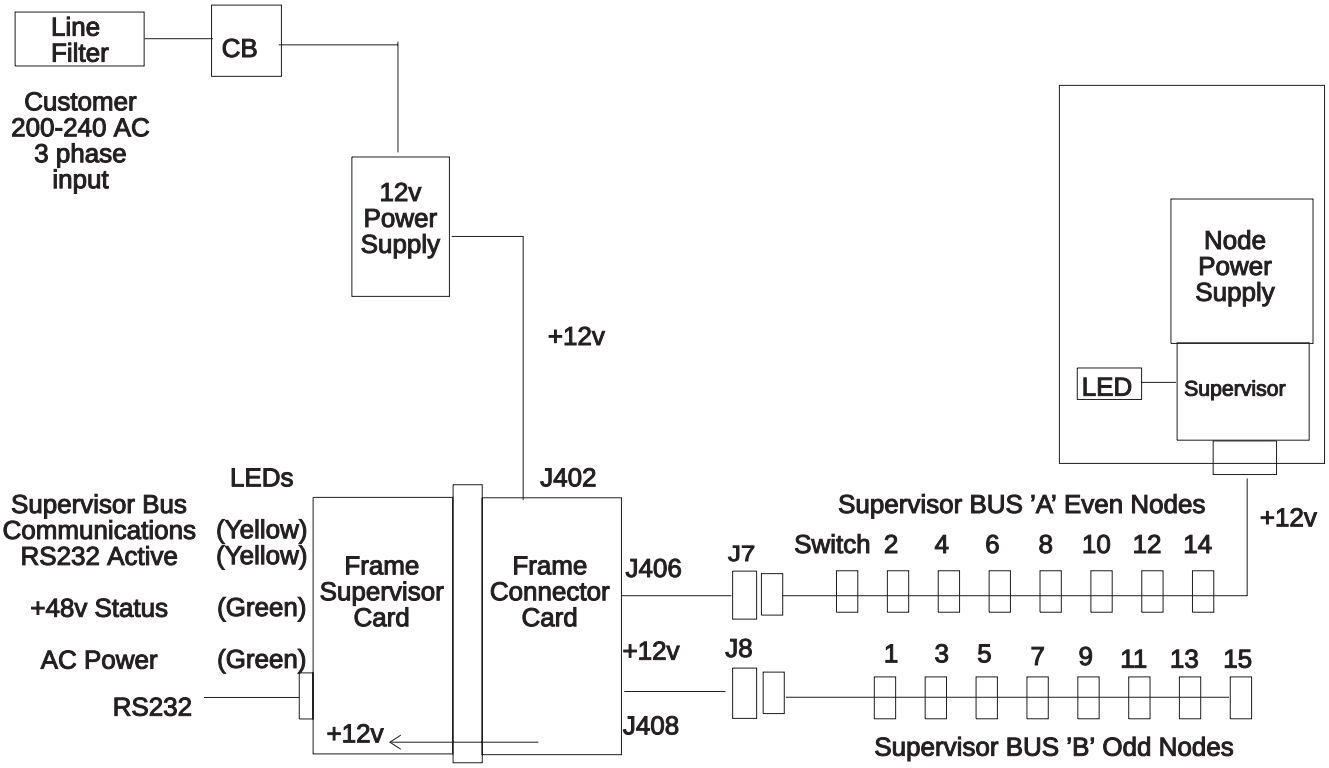

Figure 1-22. PDU Supervisor Power + 12 V dc Diagram

001

Problem with supervisor power supply 12 V dc:

Did you get here from "MAP 0110: Supervisor Subsystem" on page 1-10?

Yes **No**

002

– Check green and yellow LEDs on processor nodes. If none are lit, detach supervisor harness from one processor node, then reinsert to cause Node Supervisor Self-Test to run. Refer to "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for this procedure.

Were any green or yellow LEDs on any processor node lit before or during this test?

Yes **No**

003

– Go to Step 005 on page 1-238.

004

There is some 12 V dc power in the frame.
– Go to Step 005 on page 1-15 to check frame supervisor.

005

No 12 V dc supervisor power available. LEDs on frame supervisor card and node supervisor cards do not light.

DANGER

High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove primary power to the frame.

– Open Power Distribution Unit ac and dc power sections.
– Check connection of cable PDU-FC-P402 at connector card.
– If cable PDU-FC-P402 was already seated properly, disconnect cable PDU-FC-P402 at connector card and check continuity of cable between PDU-FC-P402 and 12 V dc supervisor power supply.

Does the cable appear okay and show continuity?

Yes **No**

006

– Fix cable PDU-FC-P402 problem. If necessary, to replace this cable, replace the entire PDU.
– Go to Step 044 on page 1-242 to verify fix.

007

– Using a multimeter, check resistance between connector card PDU-FC-J402 pin 1 and pin 2.

Is the resistance less than 5.0 ohms?

Yes **No**

008

– Check all cables from a 12 V dc supply for a problem such as a poor cable connection or open cable.

Do the cables and connections from the 12 V dc supply appear to be okay?

Yes **No**

009

– Fix or replace cable as necessary.
– Go to Step 044 on page 1-242 to verify fix.

010

– For RS/6000 SP frames, replace the +12 V dc supervisor power supply.
– For 9076 SP1 frames, replace supervisor power supply.
– Reinstall covers over Power Distribution Unit ac and dc sections.
– Reconnect ac and put the main circuit breaker in the On ('1') position.

Do any frame supervisor LEDs light?

Yes **No**

011

DANGER

High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove primary power to the frame.

– Open Power Distribution Unit dc section.
– Replace connector card.
– Go to Step 044 on page 1-242 to verify fix.

012

Power problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

013

– Go to Step 014

014

Short in 12 V dc distribution.
– Disconnect supervisor harnesses PDU-BH-P7 and PDU-BH-P8 from the Power Distribution Unit.
– Check for short between connector card PDU-FC-J402 pin 1 and pin 2.

Does short disappear with both cables removed?

Yes **No**

015

– Disconnect supervisor tailgate cables at connector card PDU-FC-J406 and PDU-FC-J408, then check for short between connector card PDU-FC-J402 pin 1 and pin 2.

Does short disappear with both cables removed?

Yes **No**

016

Short in frame supervisor card cage.
– Unscrew connector card faceplate and unseat connector card from backplane card.
– Check for short between connector card PDU-FC-J402 pin 1 and pin 2.

Has short disappeared?

Yes **No**

017

– Replace connector card.
– Go to Step 043 on page 1-242.

018

– Reseat connector card.
– Unscrew frame supervisor card faceplate and unseat frame supervisor card from backplane card.
– Check for short between connector card PDU-FC-J402 pin 1 and pin 2.

(Step **018** continues)

018 (continued)
Has short disappeared?
Yes **No**

019

– Replace backplane card.
– Go to Step 043 on page 1-242 to verify fix.

020

– Replace frame supervisor card.
– Go to Step 043 on page 1-242 to verify fix.

021

– Replace tailgate cable(s) PDU-FC-P406 and/or PDU-FC-P408, whichever is causing the short condition.
– Go to Step 043 on page 1-242 to verify fix.

022

– Short detected on a supervisor harness.
– Reconnect cables PDU-BH-P7 and PDU-BH-P8 one-at-a-time, checking for a short condition between connector card PDU-FC-J402, pin 1 and pin 2 each time.

Do you detect a short condition after reconnecting either cable?
Yes **No**

023

No short detected.
– Call next level of support.

024

Short isolated to a single supervisor harness.
– Disconnect the shorted supervisor harness from the processor node(s) N00-BH-J8 and/or switch assemblies HPS-BH-J2 (one-at-a-time), until the short condition disappears, or the supervisor harness is entirely disconnected.

Does the short condition disappear by disconnecting the supervisor harness from a processor node(s) and/or switch assemblies?
Yes **No**

025

– Replace this supervisor harness.
– Go to Step 043 on page 1-242 to verify fix.

026

Short is inside a processor node or switch assembly.
– Go to Step 027.

027

(Step **027** continues)

027 (continued)

Is this an HiPS 2.0, HiPS 3.0 or HiPS-LC8?

Yes **No**

No → **028**

– Go to Step 034.

Yes → **029**

– Remove processor node or switch assembly from the system. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Disconnect supervisor cable at supervisor card NS-J101 or SP-J101, then check for a short between supervisor card NS-U102 or SP-U102 pin 1 and pin 2.

Has short disappeared?

Yes **No**

No → **030**

– Replace the node or switch supervisor card.
– Go to Step 043 on page 1-242.

Yes → **031**

– Reattach supervisor cable at supervisor card J101. Access rear connector panel at rear of assembly.
– Detach supervisor bus card from cable SB-P102, then check for short between node supervisor card NS-U102 or SP-U102 pin 1 and pin 2.

Has the short disappeared?

Yes **No**

No → **032**

– Replace supervisor cable N00-NS-P101 or S00-SP-P101.
– Go to Step 043 on page 1-242 to verify fix.

Yes → **033**

– Replace supervisor bus card.
– Go to Step 043 on page 1-242 to verify fix.

034

– Remove switch assembly from the system. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Disconnect switch inner chassis cable connections P4, P5, and P6. Check for a short between connector P3 pin p1 and pin p2.

Has short disappeared?

Yes **No**

No → **035**

– Replace switch inner chassis cable.
– Go to Step 043 on page 1-242.

Yes → **036**

(Step **036** continues)

036 (continued)
– Reattach switch inner chassis cable connector P5.
– Recheck for short at P3 pins p1 and p2.
Has the short disappeared?
Yes **No**

037

– Replace switch supervisor power card.
– Go to Step 043 to verify fix.

038

– Reattach switch inner chassis cable connector P4.
– Recheck for short at P3 pins 1 and 2.
Has the short disappeared?
Yes **No**

039

– Replace switch power card (PS2).
– Go to Step 043 to verify fix.

040

– Reattach switch inner chassis cable connector P6.
– Recheck for short at P3 pins 1 and 2.
Has the short disappeared?
Yes **No**

041

– Replace switch power card (PS1).
– Go to Step 043 to verify fix.

042

Problem resolved.
– Go to Step 043 to verify fix.

043

Component causing a short condition was replaced.
– Replace processor node(s) and/or switch assemblies from the service position. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Make sure all cables are reconnected at processor node(s) switch assemblies and at Power Distribution Unit dc section, except for connector card PDU-FC-J402.
– Check for a short condition between connector card PDU-FC-J402 pin 1 and pin 2.
Is there still a short condition at PDU-FC-J402?
Yes **No**

044

Short and/or open condition removed from 12 V dc distribution.
(Step **044** continues)

044 (continued)
– Reinstall cover(s) over Power Distribution Unit section(s) panel.
– Reapply power to the frame, then check for LEDs lit on the frame supervisor card.

Are any LEDs lit on frame supervisor card?

Yes **No**

No

045

Problem not resolved.
– Go to Step 005 on page 1-238.

Yes

046

Problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

047

Another short exists in the 12 V dc distribution.
– Go to Step 014 on page 1-239.

MAP 0410: Supervisor Power 24 V dc Problem

Problem detected with supervisor power supply- 24 V dc:

- Main power switch LED is On
- -AND- PDU rear panel LED is Off
- -BUT- some frame supervisor LEDs are On.

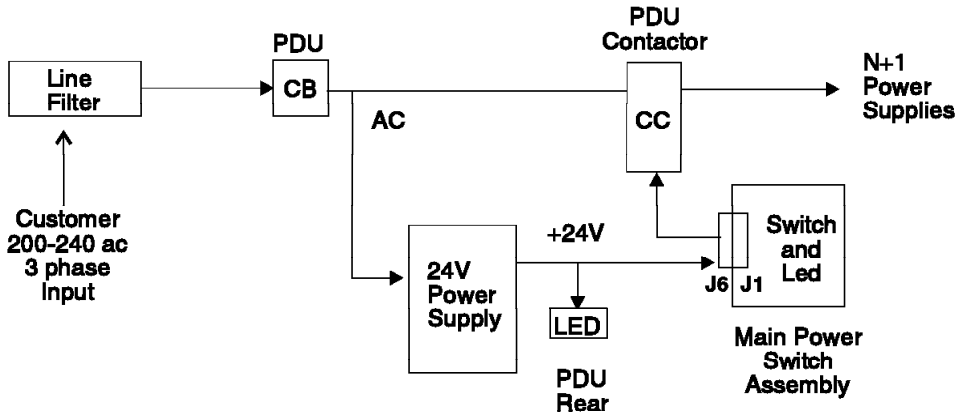

Figure 1-23. PDU + 24 V dc Circuit Diagram

001

Problem with supervisor power supply- 24 V dc.

DANGER

High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove primary power to the frame.

– Open Power Distribution Unit ac power section.
– Check all cables from 24 V dc supply for a problem such as a poor cable connection or open cable.

Do the cables and connections from the 24 V dc supply appear to be okay?

Yes **No**

002

– Fix cable problem. Reconnect ac and put main circuit breaker in the On ('1') position.
– Check PDU rear panel LED.

Is the PDU rear panel LED lit?

Yes **No**

003

Problem not resolved.
– Go to "MAP 0370: Main Power" on page 1-222.

004

Problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

005

(Step **005** continues)

005 (continued)
– Using a multimeter, measure resistance from contactor coil pin A1 (positive lead) and A2 (negative lead).

Is resistance < 40 ohms?

Yes **No**

006

– For RS/6000 SP frames, replace +24 V supervisor power supply.
– Replace supervisor power supply.
– Reconnect ac and put main circuit breaker in the On (‘1’) position.

Does the Power Distribution Unit rear panel LED light?

Yes **No**

007

– Check for a cable problem. Replace power distribution unit if necessary.
– Go to “MAP 0570: End of Call” on page 1-357.

008

Supervisor power 24 V dc is now present in system.

Is the problem resolved?

Yes **No**

009

Problem not resolved.
– Go to “MAP 0370: Main Power” on page 1-222.

010

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

011

– Disconnect wire from contactor coil pin A1 or A2, then measure resistance between contactor pin A1 and A2.

Is resistance < 40 ohms?

Yes **No**

012

– Go to Step 002 on page 1-244.

013

– Replace contactor.
– Reinstall cover over Power Distribution Unit ac section.
– Reconnect ac power, then with the main circuit breaker in the On (‘1’) position, check Power Distribution Unit rear panel LED.

(Step **013** continues)

013 (continued)

Is the Power Distribution Unit rear panel LED lit?

Yes **No**

014

DANGER

High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove primary power to the frame.

– Open Power Distribution Unit ac power section.
– Go to Step 006 on page 1-245.

015

Problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

MAP 0420: Main Power Switch

Problem detected concerning Main Power Switch LED:

- The main power switch LED is Off.

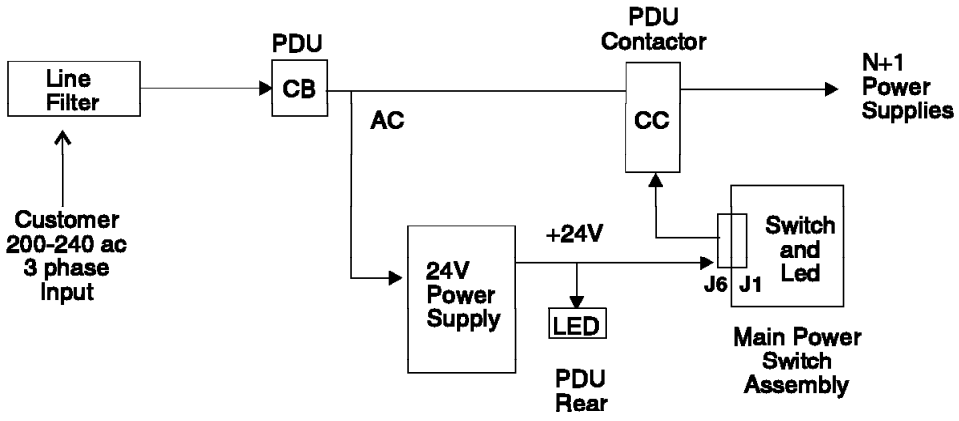

Figure 1-24. PDU + 24 V dc Circuit Diagram

001

LED on Main Power Switch is not lit.
– Check Main Power Switch position.
Is Main Power Switch in On (‘1’) position?
Yes **No**

002

– Put Main Power Switch in On ('1') position.
– Check conditions in table from Step 001 on page 1-226
Do any of these conditions exist?
Yes **No**

003

No power problems.
– Go to “MAP 0570: End of Call” on page 1-357.

004

– Go to Step 001 on page 1-226 to continue service.

005

– Go to Step 006

006

– Check processor nodes for any Power (green) LEDs On or flashing. If no Power (green) LEDs are lit, make sure that the circuit breaker at the front of at least one processor node is in the On (‘1’) position.
(Step **006** continues)

006 (continued)
Are green LEDs On or Flashing on any processor node(s) (excluding those due to self-test)?
Yes **No**

007

No 48 V dc power at processor nodes.
– Check cable PDU-BH-P6 for an obvious problem.
Does the cable appear to be okay?
Yes **No**

008

– Fix the obvious cable problem.
– Go to "MAP 0570: End of Call" on page 1-357.

009

– Disconnect cable PDU-BH-P6 from Power Distribution Unit.
– With main power switch in On ('1') position, check for continuity between PDU-BH-P6 pin 2 and pin 5, then check for continuity between pin 3 and pin 4.
Is there continuity in both cases on connector PDU-BH-P6?
Yes **No**

010

Problem with the main power switch.
– Open the main power switch assembly.
– Disconnect the white connector of the main power switch from the main power switch cable PDU-SW-P1.
– With main power switch in On ('1') position, check for continuity between the two pins of the white main power switch connector.
Is there continuity between these two pins?
Yes **No**

011

– Replace main power switch. Make sure to connect main power switch connector to the main power switch cable PDU-SW-P1.
– Reconnect main power switch cable PDU-BH-P6 at Power Distribution Unit.
– Reconnect ac power and power on system.
– Go to Step 002 on page 1-247 to verify fix.

012

– Replace main power switch cable PDU-BH-P6.
– Go to Step 002 on page 1-247 to verify fix.

013

Main power switch not getting 24 V dc power from connector.

DANGER

High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove primary power to the frame.

– Open Power Distribution Unit ac power section.
– Check for continuity between contactor pin A1 and PDU-BH-J6 pin 2 and pin 5.
– Check for continuity between 24 V supervisor power supply + terminal and PDU-BH-J6 pin 4.

Is there continuity in all cases?

Yes **No**

014

– Replace cables as required.
– Reconnect ac power and power on system.
– Go to Step 002 on page 1-247 to verify fix.

015

– Call next level of support.

016

– Main power LED card should be replaced; however, this action requires powering off all processor nodes.

Are there other problems requiring this frame to be powered off?

Yes **No**

017

Schedule maintenance to replace main power LED card.
Go to "MAP 0570: End of Call" on page 1-357

018

Replace main power LED card.
Go to "MAP 0570: End of Call" on page 1-357

MAP 0430: dc Power Loss from Bulk dc Power Supply(s)

System monitor log reports “dc Power Loss” for any bulk dc power supplies:

- Refer to Figure 1-25 to view the dc bulk power supplies.

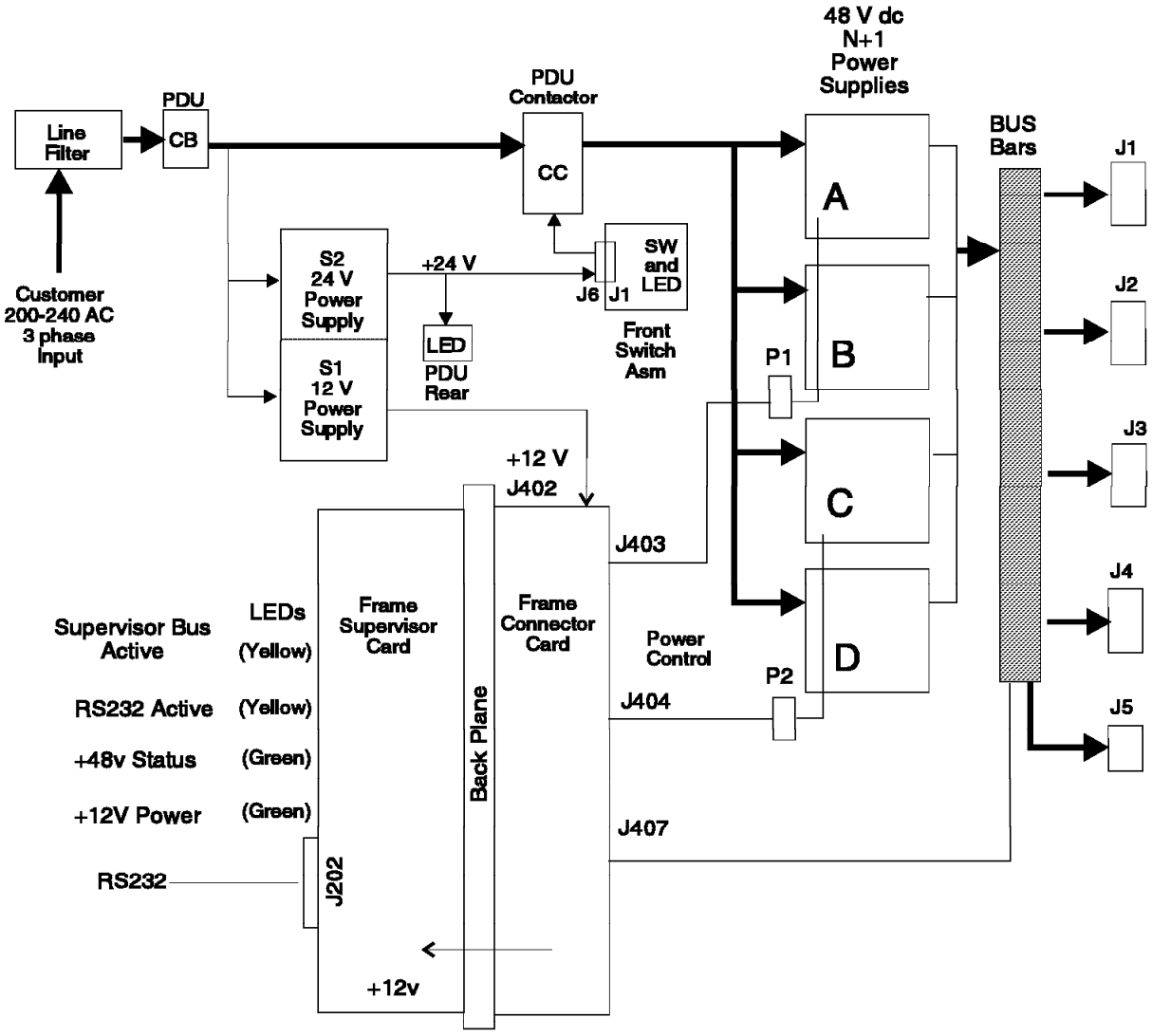

Figure 1-25. PDU + 48 V dc Power Diagram

001

– From the system monitor on the control workstation, open the “Frame Environment” window.
– Check for “dc Power Loss” (red) condition for all four power supplies.

- If all four show “dc Power Loss”, then open “Global commands” window and power-off all processor nodes in this frame.
- If only one shows “dc Power Loss”, then order another supply for use in isolating the failing part.

– From the “Frame Environment” window, attempt to power on any bulk dc power supplies which are indicating a “dc Power Loss” (red) condition, by clicking on the On button corresponding to the power supplies.

(Step **001** continues)

001 (continued)

Does the system monitor still indicate “dc Power Loss” (red) for the supplies?

Yes **No**

002

Power supply is now enabled.

– If components were replaced or service action was completed, refer to "Procedures for Skirts and Main Power Switch" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to replace the air filter assembly and acoustic skirts.

– Go to “MAP 0570: End of Call” on page 1-357.

003

One or more bulk dc power supplies shows a dc failure.

– Refer to "Procedures for Skirts and Main Power Switch" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to remove acoustic skirts and air filter assembly.

– Check the LEDs on the front of the bulk dc power supplies.

```
Yellow LED: ac In - Indicates power supply is getting ac power and
                        power switch is in On (‘1’) position.
Green LED: dc OK - Indicates power supply is supplying 48 volt dc power.
```

Are yellow LEDs unlit on any bulk dc power supplies?

Yes **No**

004

ac input is okay and all power supplies are enabled from system monitor.

Are green LEDs lit on all bulk dc power supplies?

Yes **No**

005

Some green LEDs are not lit.

Are green LEDs lit on any bulk dc power supplies?

Yes **No**

006

Probable short in 48 V dc power distribution.

– Go to “MAP 0440: Short in 48 V dc Power Distribution” on page 1-257.

007

– Go to Step 025 on page 1-253.

008

– Go to Step 025 on page 1-253.

009

– Remove filter bracket and ensure that switches for all power supplies are in the On (‘1’) position. Put switches in the On (‘1’) position if necessary.

– Check LEDs on front of bulk dc power supplies.

(Step **009** continues)

009 (continued)
Are yellow LEDs unlit on any bulk dc power supplies?
Yes **No**

010

No ac input problem.
Did you just put a switch in the On ('1') position?
Yes **No**

011

– Go to Step 025 on page 1-253 to continue service.

012

– Go to Step 001 on page 1-250 to verify fix.

013

– Go to Step 014

014

One or more bulk dc power supplies showing ac input problem.
Are all yellow LEDs unlit?
Yes **No**

015

Bulk dc power supply failure(s).
– Replace bulk dc power supplies where yellow LEDs are not lit.
– Put switch in the On ('1') position.
– Check LEDs on the front of this supply.
Is the yellow LED lit?
Yes **No**

016

Problem in power chassis.
– Go to Step 023 on page 1-253.

017

– Go to Step 001 on page 1-250 to verify fix.

018

48 V power chassis not getting ac power.

DANGER

High voltage present. Use high voltage test probes.

– Check phase-to-phase ac voltage at ac filter test points. Measure ac voltage from O1 to O2, O1 to O3, and O2 to O3.
(Step **018** continues)

018 (continued)
Is ac voltage present and between 180-254 volts ac for all phases?
Yes **No**

019

ac power problem.
– Go to "MAP 0370: Main Power" on page 1-222.

020

DANGER

High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove primary power to the frame.

– Open Power Distribution Unit ac section.
– Check cables from contactor for an obvious problem such as a poor connection or damaged cable.
Do cables from the contactor appear okay?
Yes **No**

021

– Replace cables as required.
– Reinstall covers over Power Distribution Unit ac section.
– Reconnect ac power and power on system.
– Go to Step 001 on page 1-250 to verify fix.

022

– Replace contactor.
– Reinstall covers over Power Distribution Unit ac section.
– Reconnect ac power and power on system.
– Check yellow LEDs on bulk dc power supplies.
Do yellow LEDs light on any bulk dc power supplies?
Yes **No**

023

– Replace power supply chassis.
– Reinstall covers over Power Distribution Unit ac and dc sections.
– Reconnect ac power and power on system.
– Go to Step 001 on page 1-250 to verify fix.

024

– Go to Step 001 on page 1-250 to verify fix.

025

Bulk dc power supplies getting ac power, but indicating ac problem or "dc Power Loss" condition.
– Make a note of which power supplies (A, B, C, or D) is indicating a problem.
– Try swapping a power supply indicating an ac or "dc Power Loss" with a good supply.

Note: This step may be done while system is in use; however, at least three bulk dc power supplies must be operating at all times to ensure adequate power for full system utilization.

Does the good supply give the same indication?

Yes **No**

026

Original bulk dc power supply is bad.
– Replace the original bulk dc power supplies.
– Go to Step 001 on page 1-250 to verify fix.

027

DANGER

High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove primary power to the frame.

– Open Power Distribution Unit dc section.
– Check the following two point-to-point connections between 48 V power chassis and connector card for an obvious problem such as a poor connection or a damaged cable:

- Cable PDU-FC-P403 to ADC-BH-P1
- Cable PDU-FC-P404 to ADC-BH-P2

– Check for an obvious short between the **+48 V and +48 VRtn** busbars.

Do the cables and connection appear okay?

Yes **No**

028

– Fix the obvious problem.
– Go to Step 038 on page 1-255 to verify fix.

029

Bulk dc power supplies A and B share the same cable, while bulk dc power supplies C and D share a different cable.

A. B: Cable PDU-FC-P403 to ADC-BH-P1
C, D: Cable PDU-FC-P404 to ADC-BH-P2

Is the ac problem or "dc Power Loss" (red) indication limited to a single supply or both supplies on a single cable?

Yes **No**

030

– Problem is in one of the following components:

1. Frame supervisor card. (Can be done with system powered on.)
2. Connector card
3. Backplane card

– Replace components one by one, powering off system (except where indicated) to replace the component, then powering on the system (where necessary) and checking the system monitor for the "dc Power Loss" cleared (green instead of red) condition.

(Step **030** continues)

030 (continued)
Were you able to correct the problem?
Yes **No**

031

– Call next level of support.

032

Problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

033

– Swap cables PDU-FC-P403 and PDU-FC-P404 at connector card end only.
– Reconnect ac power and power on system.
– From the "Frame Environment" window, check the "PowerDC" indicator for red, which indicates a "dc Power Loss" condition.

Is the same supplies (A, B, C, or D) identified in Step 025 on page 1-253 reporting a problem?
Yes **No**

034

– Swap cables ADC-BH-P1 and ADC-BH-P2 at 48 V power chassis end only.
– Reconnect ac power and power on system.
– Check the "Frame Environment" window for a "dc Power Loss" (red) condition.

Is the original supplies reporting a "dc Power Loss" (red) condition again?
Yes **No**

035

Problem in cable(s).
– Swap cables PDU-FC-P403 and PDU-FC-P404 at both connector card and 48 V power chassis to return them to the original connections as shown below.
– Replace the problem cable as indicated below:

A, B: Cable PDU-FC-P403 to ADC-BH-P1
C, D: Cable PDU-FC-P404 to ADC-BH-P2

– Go to Step 038 to verify fix.

036

– Replace the power supply chassis.
– Go to Step 001 on page 1-250.

037

– Swap cables PDU-FC-P403 and PDU-FC-P404 at connector card end to return to the correct connections.
– Go to Step 030 on page 1-254 to continue service.

038

(Step **038** continues)

038 (continued)
– Power on system and check the “Frame Environment” window for “dc Power Loss” (red) condition.
Is the problem resolved?

Yes **No**

039

Problem not resolved.
– Go to Step 029 on page 1-254 to continue service.

040

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

MAP 0440: Short in 48 V dc Power Distribution

Short in 48 V dc distribution system. Refer to Figure 1-26 for a diagram of the RS/6000 SP frame 48 volt distribution.

001

Short in 48 V dc power distribution.

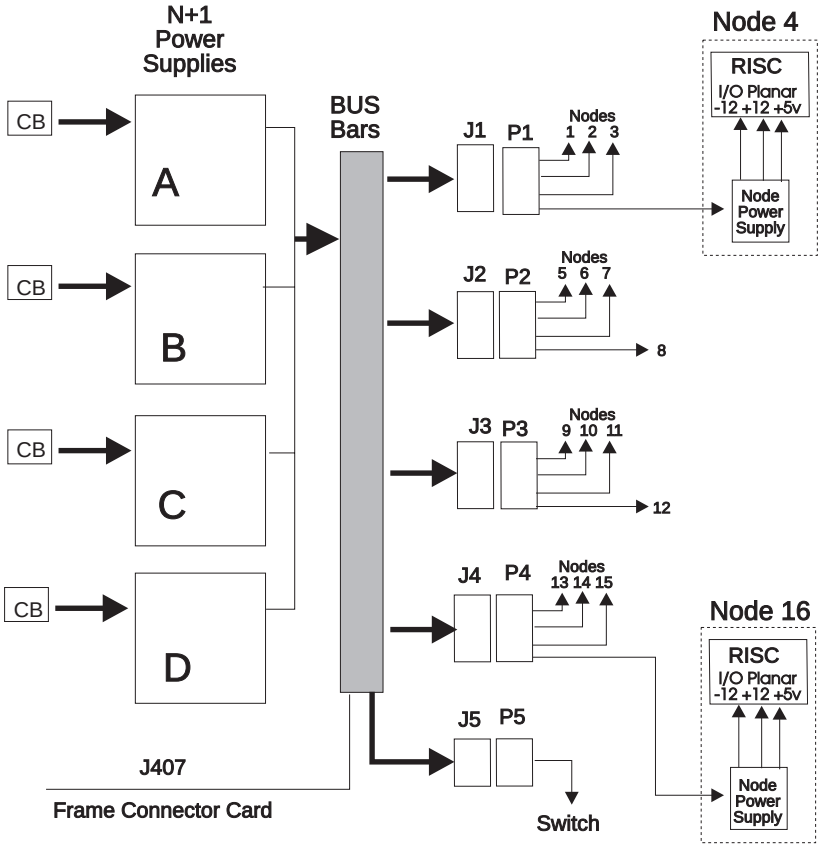

Figure 1-26. PDU 48 Volts Distribution Diagram

– Switch all processor node and switch assembly circuit breakers to Off (‘0’) position.
– Disconnect dc distribution cables PDU-BH-P1, PDU-BH-P2, PDU-BH-P3, PDU-BH-P4, and PDU-BH-P5 at Power Distribution Unit. This isolates 48 V dc to the Power Distribution Unit only.
– Remove front skirt assembly and air filter bracket.
– Turn on all bulk power supplies from the control workstation.
– Check green LEDs on all bulk power supplies.

Are green LEDs lit on all bulk power supplies?

Yes **No**

002

dc short detected in the Power Distribution Unit section.

DANGER

High voltage present. Perform “Lockout/Tagout Procedure for PDU” on page 1-2 or “Lockout/Bagout Procedure for PDU” on page 1-3 to remove primary power to the frame.

– Remove rear panel of Power Distribution Unit dc section.
– With all power removed from the system. Disconnect busbars from 48 V power chassis dc lugs.
– Check continuity between **+48 V** and **-48 VRtn** busbars.

Is there continuity between +48 V and -48 VRtn busbars?

Yes **No**

003

– Reconnect busbars to 48 V power chassis lugs.
– Reinstall Power Distribution Unit dc section cover.
– Unseat all bulk dc power supplies.
– Reconnect ac power and power on system.
– Put main circuit breaker in the On (‘1’) position.
– Reseat all bulk dc power supplies one at a time, flip the bulk power supply circuit breakers to On (‘1’) position, then check that yellow and green LEDs are lit when reseated.

Do any bulk power supplies light both yellow and green LEDs?

Yes **No**

004

DANGER

High voltage present. Perform “Lockout/Tagout Procedure for PDU” on page 1-2 or “Lockout/Bagout Procedure for PDU” on page 1-3 to remove primary power to the frame.

– Replace power supply chassis.
– Reconnect ac power and power on system.
– Go to “MAP 0570: End of Call” on page 1-357.

005

– Replace any bulk dc power supplies which cause bulk dc power supply green LED(s) to go off or cause main circuit breaker to trip to Off (‘0’) position.
– Go to “MAP 0570: End of Call” on page 1-357.

006

– Remove plastic cover over busbars.
– Check for an obvious short between the **+48 V** and **-48 VRtn** busbars.

Is there an obvious short between the +48 V and -48 VRtn busbars?

Yes **No**

007

Short in tailgate cables PDU-BH-J1, PDU-BH-J2, PDU-BH-J3, PDU-BH-J4, and/or PDU-BH-J5.

– Set multimeter to constantly check continuity between the **+48 V** and **-48 VRtn** busbars.
– Starting from closest connection, start removing cable connections to the '+' busbar. Repeat this until there is no longer continuity.
– Replace dc tailgate cable connected to the wire you just removed.
– While checking continuity, start reattaching the cable connections you had removed above. Replace any other cables which cause continuity between the **+48 V** and **+48 VRtn** busbars.

(Step **007** continues)

007 (continued)
– Go to Step 008.

008

– If necessary, reconnect busbars.
– Remove the obvious short between busbars.
– Reinstall plastic cover over the busbars.
– Reinstall panel over Power Distribution Unit dc section.
– Reconnect ac power and power on system.
– Go to Step 009.

009

Possible short in dc distribution cables.
– One at a time, reconnect dc distribution cables PDU-BH-P1, PDU-BH-P2, PDU-BH-P3, PDU-BH-P4, and PDU-BH-P5 at Power Distribution Unit.
– After each connection, check frame supervisor green LED #2 for an OFF condition, indicating a short condition.

Are you able to reconnect all cables without indication of a short condition?

Yes **No**

010

– Replace the cable that caused the short condition.
– From the control workstation, turn on any bulk dc power supplies that are off.
– Check frame supervisor green LED #2 for an OFF condition, indicating a short condition.

Is there still a short condition following replacement of this cable?

Yes **No**

011

Problem resolved.
– Make sure all cables in Step 009 are reconnected.
– Go to “MAP 0570: End of Call” on page 1-357.

012

Short inside processor node(s) or switch assemblies.
– Disconnect this dc distribution cable from all processor nodes.
– From the control workstation, turn on any power supplies that are off.
– Reconnect the dc distribution cable to processor node(s) or switch assemblies one at a time, checking the bulk dc power supplies for indication of a short condition.
– Check frame supervisor green LED #2 for an OFF condition, indicating a short condition.

Are you able to reconnect the cable to all processor nodes or switch assemblies without indication of a short condition?

Yes **No**

013

– Remove the processor node or switch assembly causing the short condition from the frame.
– Check the 48 V dc power harness inside the processor node or switch assembly for an obvious problem such as a chafed or broken cable.

(Step **013** continues)

013 (continued)

Is there an obvious problem with the 48 V dc power harness?

Yes **No**

014

– Replace the 48 V dc power harness.
– Reconnect the processor node or switch assembly and check for a short condition again.
– Continue at the second bullet (powering on any bulk dc power supplies that are Off) of Step 012 on page 1-259.

015

– Correct the obvious problem. If necessary, replace the 48 V dc power harness.
– Reconnect the processor node or switch assembly and check for a short condition again.
– Continue back at the second bullet of Step 012 on page 1-259.

016

– Go to Step 009 on page 1-259 and reconnect next cable.

017

Possible short in processor node(s) or switch assemblies.

– Put processor node and switch assembly circuit breakers in On (‘1’) position one at a time, checking the frame supervisor green LED #2 for an OFF condition, indicating a short condition.

Are you able to power on all processor nodes and switch assemblies without indication of a short condition?

Yes **No**

018

– Remove the processor node or switch assembly causing the short condition from the frame.
– Check the 48 V dc power harness inside the processor node or switch assembly for an obvious problem which might be causing the short condition.

Is there an obvious problem which might be causing the short condition?

Yes **No**

019

– Replace the node supervisor card or switch power card.

Note: If this is an HiPS 2.0 switch assembly, replace the entire switch assembly to fix problem.

– Reconnect the processor node or switch assembly and put circuit breaker in the On (‘1’) position.
– From the control workstation, enable any power supplies that are turned off.
– Go to Step 017.

020

– Fix the obvious problem which might be causing the short condition.
– Reconnect the processor node or switch assembly and put circuit breaker in the On (‘1’) position.

(Step **020** continues)

020 (continued)

– Check the frame supervisor green LED #2 for an OFF condition, indicating a short condition.

Is there an indication of a short condition?

Yes **No**

No:

021

– Go to Step 017 on page 1-260.

Yes:

022

– Go to Step 019 on page 1-260 to continue service.

023

Either no short condition was detected or the short condition was resolved.

– Go to "MAP 0570: End of Call" on page 1-357.

MAP 0450: Frame Environment

Problem indicated by frame supervisor.

Pri-ority	Condition	Action
1	Frame supervisor green LED #2 (dc OK) is flashing.	Go to Step 001.
2	Frame temperature indicates over 40° C.	Go to Step 008 on page 1-264.

001

Frame 48 V dc voltage out of range.

DANGER

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

– Remove rear panel of PDU dc section.
– Unplug the 48 V dc sense cable PDU-FC-P407 at connector card.
– Using a multimeter, measure the dc voltage between PDU-FC-P407 pin 1 and pin 3.
– Replug the 48 V dc sense cable PDU-FC-P407 at connector card.

Is the measured voltage in the range 44-52 V dc?

Yes **No**

002

DANGER

High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove all power to the frame.

– Replace the 48 V dc sense cable PDU-FC-P407.
– Reconnect ac power and power on system.
– Go to "MAP 0570: End of Call" on page 1-357.

003

– Use the following prioritized table to continue service:

Priority	Condition	Action
1	Frame supervisor card	1. Replace card (can be done with system powered) 2. Go to Step 005 on page 1-263.
2	Connector card	**DANGER** **High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove all power to the frame.** 1. Replace card. Make sure to connect all cables. 2. Go to Step 004 on page 1-263.
3	Backplane card	**DANGER** **High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove all power to the frame.** 1. Replace card. Make sure to connect all cables. 2. Go to Step 004 on page 1-263.
4	All replaced	Call next level of support.

004

– Reconnect power to the frame.
– Put main power switch in the On ('1') position.
– From the control workstation, open the "Frame Environment" window and make sure that all indicators for the bulk dc power supplies show good status (green). You may need to click on the On button to enable them.
– Go to Step 005.

005

Component replaced and system powered on.
– Check frame supervisor green LED #2 for a solid ON condition.

Does frame supervisor green LED #2 show a solid ON condition?

Yes **No**

006

Problem not resolved.
– Go to Step 003 on page 1-262 to replace the next priority part.

007

(Step **007** continues)

007 (continued)
– Go to Step 011 to verify fix.

008

Frame supervisor has detected a temperature beyond an acceptable range for the system.
– Check the air filter area (behind the front skirt) and around the Power Distribution Unit area for obvious airflow blockage or external source of heat.

Is there obvious blockage or external source of heat?

Yes **No**

No:

009

Frame supervisor card may be reporting incorrect temperature.
– Replace the frame supervisor card.
– Go to Step 011 to verify fix.

Yes:

010

– Remove blockage or source of heat from area.
– Go to “MAP 0570: End of Call” on page 1-357.

011

Problem resolved.
– Reinstall cover over power distribution dc section if necessary.
– Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does verification test pass?

Yes **No**

No:

012

– Go to “MAP 0110: Supervisor Subsystem” on page 1-10 to continue service.

Yes:

013

– Go to “MAP 0570: End of Call” on page 1-357.

MAP 0460: Scalable Electrical Power Base Unit (SEPBU)

Notes:

1. SEPBU is an acronym for the Scalable Electrical Power Base Unit.
2. Connectors on the SEPBU still use “PDU” as assembly designations, (for example PDU-BH-J7).

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.

Attention: Be careful when working on a single-phase SEPBU power supply **without** N+1 (two) power modules, since there is no secondary power module.

The Scalable Electrical Power Base Unit (SEPBU) consists of the following components:

- ac line cord (connectorized)
- SEPBU power chassis
- SEPBU power modules
- Frame supervisor
- PCI card (see note below)
- Main power switch
- 48 V dc distribution cables.

Note: For more information on PCI (power control interface) function, see “RS/6000 SP Function” in Chapter 2 of *RS/6000 SP: Maintenance Information, Volume 1*

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001

Problem detected concerning power in system.

Attention: Servicing a processor node with the High Performance Switch (HiPS) feature or Scalable POWERparallel Switch (SPS) 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.

– Refer to "Procedures for the Scalable Electrical Power Base Unit (SEPBU)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* when replacing SEPBU components.
– Check the condition of the following LEDs:
  - Main power switch LED
  - SEPBU rear panel LED
  - Frame supervisor LEDs.
– The following table contains a prioritized list of conditions.

  Find the first condition that describes your problem, then perform the suggested action:

  Note: The system monitor log can be viewed by issuing the following command:

  errpt -a -N sphwlog | pg

  on the control workstation.

Priority	Condition	Action
1	Main power switch LED is Off -AND- SEPBU rear panel LED is Off -AND- Frame Supervisor LEDs are Off.	Go to Step 002 on page 1-267.
2	Main power switch LED is On -OR- SEPBU rear panel LED is On, -BUT- all frame supervisor LEDs are Off.	Go to Step 032 on page 1-272.
3	Main power switch LED is Off	Go to Step 035 on page 1-272.
4	System monitor log reports “dc Power Loss” for any power module(s).	Go to Step 051 on page 1-274.
5	Frame temperature is over 40° C.	Go to Step 081 on page 1-278.
6	Problem with 48 V dc power distribution to processor node(s) or switch assemblies.	Go to “MAP 0480: Open in 48 V dc Distribution” on page 1-283.

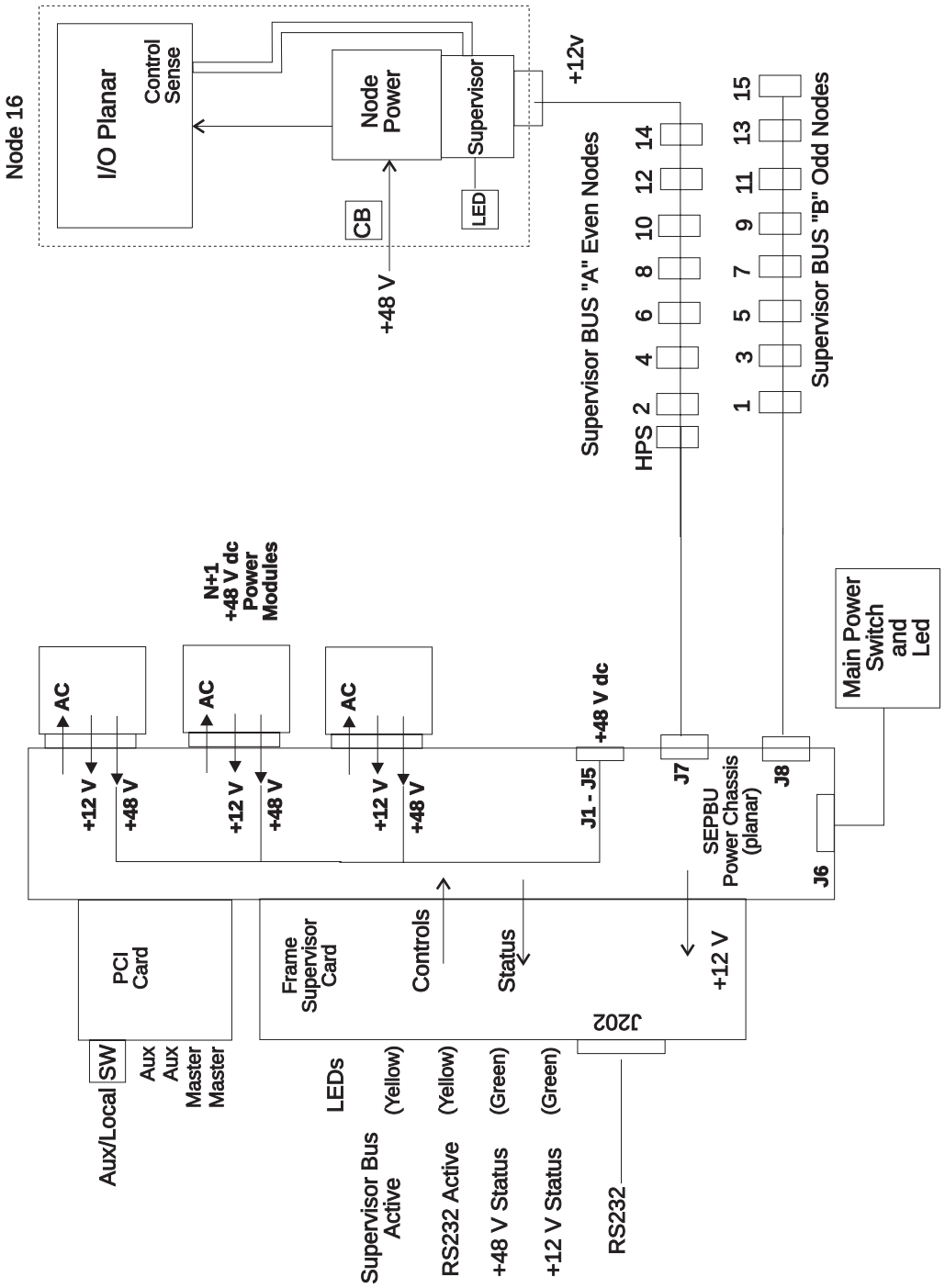


Figure 1-27. SEPBU Power Diagram

002

– Problem detected concerning power in the system.

- Main power switch LED is Off
- -AND- SEPBU rear panel LED is Off
- -AND- Frame Supervisor LEDs are Off.

DANGER

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

– Put main power switch in the Off (‘0’) position.

Note: Test points Z1, Z2, and Z3 are current limited. Therefore the measured test point voltage will be slightly less than the actual line voltage. For example, the line voltage may be 208, and the measured test point voltage may be 193.

– Using a multimeter, check ac phase-to-phase voltage between test points Z1, Z2, and Z3. The measured voltage should be in the range 180-415 V ac.

Is there an ac power problem, i.e., no ac voltage?

Yes **No**

003

– Go to Step 013 on page 1-269.

004

Problem with the power coming into the frame.

– Put the circuit breaker at the front of each power module in the Off (‘0’) position.
– Unseat all power modules from the SEPBU so that they are out at least three inches (10 centimeters) from the SEPBU power chassis.
– Have customer put his wall circuit breaker in the On position.
– Check the state of the customer circuit breaker.

Does the customer circuit breaker stay in the On position?

Yes **No**

005

– With main power switch in the Off (‘0’) position, disconnect ac line cord from SEPBU.
– Check for a short condition between wires on the ac line cord.

Is there a short condition on the ac line cord?

Yes **No**

006

– Refer to "Removing the SEPBU Power Control Interface (PCI) Card" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 077 on page 1-278 to verify fix.

007

Short detected in the ac line cord.

– Refer to "Removing the SEPBU ac Line Cord" at *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 077 on page 1-278 to verify fix.

008

– Repeat the ac voltage test from Step 002 on page 1-267.

(Step **008** continues)

008 (continued)

Is ac present and within 200-415 V ac?

Yes **No**

009

– Refer to "Replacing the SEPBU ac Line Cord" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 077 on page 1-278 to verify fix.

010

– One-at-a-time, install power modules, each time putting the circuit breaker at the front of the power module in the On (‘1’) position and repeating the ac voltage measurement from Step 002 on page 1-267.

Was an ac voltage problem detected when any power module was reinstalled?

Yes **No**

011

All power modules were installed with no ac problem detected.
– Go to Step 077 on page 1-278 to verify the SEPBU.

012

– Refer to "Replacing the SEPBU Power Module" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to replace the SEPBU power module.
– Return to Step 010 to install next power module and/or verify the replacement.

013

Possible problem with 12 V dc supervisor power.
– Put main power switch in the On (‘1’) position.
– Verify that the power module(s) circuit breaker(s) are in the On (‘1’) position.
– Disconnect cables PDU-BH-P7 and PDU-BH-P8.
– Check frame supervisor LEDs and SEPBU rear panel LED.

Are any LEDs lit?

Yes **No**

014

– Check for only one power module installed in the SEPBU.

Is there only one power module in the SEPBU?

Yes **No**

015

More than one power module in SEPBU.
– Go to Step 032 on page 1-272 to verify fix.

016

Single power module in SEPBU.
– Refer to "Replacing the SEPBU Power Module" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to replace the SEPBU power module.

(Step **016** continues)

016 (continued)
– Go to Step 077 on page 1-278 to verify fix.

017

– Reconnect cables PDU-BH-P7 and PDU-BH-P8 one-at-a-time, checking frame supervisor LEDs and SEPBU rear panel LED for LEDs to go unlit, each time.

Do LEDs go unlit after reconnecting either cable.

Yes **No**

018

No problem found.
– Go to Step 077 on page 1-278 to recheck SEPBU.

019

Short isolated to a single supervisor harness.
– Disconnect the shorted supervisor harness from the processor node(s) N00-BH-J7 and/or switch assemblies S00-BH-J2 (one at a time), until the short condition disappears, or the supervisor harness is entirely disconnected.

Does the short condition disappear by disconnecting the supervisor harness from a processor node(s) and/or switch assemblies?

Yes **No**

020

– Replace this supervisor harness.
– Go to Step 029 on page 1-271 to verify fix.

021

Short is inside a processor node or switch assembly.
– Go to Step 022.

022

– Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to place processor node or switch assembly into service position.

Is this a wide processor node, SPS or SPS-8 switch assembly?

Yes **No**

023

Condition detected in a thin processor node or switch assembly.
– Disconnect cable N00-NS-P101 or S00-SP-P101 at supervisor card, then check for a short between pin 1 and 2 on component U102 (large power transistor) on supervisor card. U101 pin 1 is marked.

Do you detect a short condition between U101 pins 1 and 2?

Yes **No**

024

– Reattach cable N00-NS-P101 or S00-SP-P101 at supervisor card.
– If this is a thin processor node, access the connector panel at rear of processor node (near N00-BH-J7).

(Step **024** continues)

024 (continued)
– Detach cable N00-SB-P102 or S00-SB-P102 at supervisor bus card, then check for a short between pin 1 and 2 on component U102 (large power transistor) on supervisor card.
Do you detect a short condition between U101 pins 1 and 2?
Yes **No**

025
– Replace supervisor bus card.
– Go to Step 029 to verify fix.

026
– Replace cable N00-NS-P101 or S00-SP-P101.
– Go to Step 029 to verify fix.

027
– Go to Step 028.

028
– Refer to "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to replace the appropriate part from the following list:

- Processor node supervisor card
- HiPS 2.0 switch assembly
- HiPS 3.0 switch supervisor card
- HiPS-LC8 switch supervisor card
- SPS switch supervisor card
- SPS-8 switch supervisor card

– Go to Step 029.

029
Component causing a short condition was replaced.
– Make sure all cables are reconnected in processor node(s) switch assemblies and at SEPBU.
– Check frame supervisor LEDs and SEPBU rear panel LED.
Are any LEDs lit?
Yes **No**

030
Another short exists in the 12 V dc distribution.
– Go to Step 013 on page 1-269.

031
Problem resolved.
– Go to Step 084 on page 1-279.

032
(Step **032** continues)

032 (continued)
– Problem detected with the frame supervisor.

- Main power switch LED is On
- -OR- PDU rear panel LED is On,
- -BUT- all frame supervisor LEDs are Off.

– Refer to "Replacing the SEPBU Frame Supervisor Card" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Recheck the LED conditions listed in the above step.
Are any frame supervisors lit?
Yes **No**

033

– Refer to "Replacing the SEPBU Power Control Interface (PCI) Card" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to replace the SEPBU power chassis.
– Go to Step 077 on page 1-278 to verify fix.

034

Problem resolved.
– Go to Step 077 on page 1-278 to verify fix.

035

Problem detected concerning Main Power Switch LED:

The main power switch LED is Off.

LED on Main Power Switch is not lit.
– Check main power switch position.
Is main power switch in On (‘1’) position?
Yes **No**

036

– Put main power switch in On (‘1’) position.
– Check conditions in table from Step 001 on page 1-265.
Do any of these conditions exist?
Yes **No**

037

No power problems. Go to “MAP 0570: End of Call” on page 1-357.

038

– Go to Step 001 on page 1-265.

039

– Go to Step 040 on page 1-273

040

(Step **040** continues)

040 (continued)

– Check processor nodes for any Power (green) LEDs On or flashing. If no Power (green) LEDs are lit, make sure that the circuit breaker at the front of at least one processor node or switch assembly is in the On (‘1’) position.

Are green LEDs On or Flashing on any processor node(s) or switch assembly (excluding those due to self-test)?

Yes **No**

041

No 48 V dc power at processor nodes.

– Check cable PDU-BH-P6 for an obvious problem.

Does the cable appear to be okay?

Yes **No**

042

– Fix the obvious cable problem.
– Go to “MAP 0570: End of Call” on page 1-357.

043

– Disconnect cable PDU-BH-P6 from SEPBU.
– With main power switch in On (‘1’) position, check for continuity between PDU-BH-P6 pin 2 and pin 5, then check for continuity between pin 3 and pin 4.

Is there continuity in both cases?

Yes **No**

044

Problem with the main power switch.

– Open the main power switch assembly.
– Disconnect the white connector of the main power switch from the main power switch cable PDU-SW-P1.
– With main power switch in On (‘1’) position, check for continuity between the two pins of the white main power switch connector.

Is there continuity between these two pins?

Yes **No**

045

– Refer to "Replacing the Main Power Switch or LED" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to replace the main power switch.
– Reconnect ac power and power on system.
– Go to Step 036 on page 1-272 to verify fix.

046

– Replace main power switch cable PDU-BH-P6.
– Go to Step 036 on page 1-272 to verify fix.

047

– Refer to "Replacing the SEPBU Power Control Interface (PCI) Card" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to replace the SEPBU power chassis.

– Go to Step 077 on page 1-278 to verify fix.

048

Main power LED card should be replaced; however, this action requires powering off all processor nodes.
Are there other problems requiring this frame to be powered off?
Yes **No**

049

– Schedule maintenance to replace main power LED card.
– Go to "MAP 0570: End of Call" on page 1-357.

050

– Refer to "Replacing the Main Power Switch or LED" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to replace the main power LED card.
– Go to "MAP 0570: End of Call" on page 1-357.

051

System monitor log reports "dc Power Loss" for any power module(s).

Note: Under light power-loading conditions, SEPBU power modules may enable/disable their outputs to maintain proper output. In this situation, you will see intermittent "dc Power Loss" conditions from the power modules. If this is a persistent problem, you may choose to put the circuit breaker of one power module in the Off ('0') position.

– From the system monitor on the control workstation, open the "Frame Environment" window.
– Allow the "Frame Environment" window a few minutes to refresh a few times. Correlate this display with the system monitor log to obtain an accurate condition.
– Check for "dc Power Loss" (red) condition for all power modules.

- If all power modules show "dc Power Loss", then open "Global commands" window and power-off all processor nodes and/or switch assemblies in this frame.
- If only one power module shows "dc Power Loss", then order another power module for use in isolating the failing part.

Does the system monitor indicate "dc Power Loss" (red) for any power module(s)?
Yes **No**

052

No problem detected.
– Go to "MAP 0570: End of Call" on page 1-357.

053

A "dc Power Loss" indicated for one or more power modules.
Are all power modules indicating a "dc Power Loss" condition?
Yes **No**

054

– Make a note of which power module(s) is indicating a problem.
– Refer to "Removing the SEPBU Power Module" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
(Step **054** continues)

054 (continued)

– Refer to "Replacing the SEPBU Power Module" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to replace the SEPBU power module with the new power module obtained in Step 051 on page 1-274.

Note: This step may be done while system is in use if the SEPBU has N+1 power modules and there is never more than one module powered off or removed from the SEPBU at a time.

– Wait for the system monitor to update the “Frame Environment” window, then check for “dc Power Loss” (red) indication.

Does the new power module give a “dc Power Loss” (red) indication?

Yes **No**

055

Original power module is bad.

– Replace the original power module(s).
– Go to Step 077 on page 1-278 to verify fix.

056

– Reinstall the original power module.
– Refer to "Replacing the SEPBU Frame Supervisor Card" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does the same power module give a “dc Power Loss” (red) indication?

Yes **No**

057

Problem resolved.

– Go to Step 077 on page 1-278 to verify fix.

058

– Refer to "Replacing the SEPBU Power Control Interface (PCI) Card" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to replace the SEPBU power chassis.
– Go to Step 077 on page 1-278 to verify fix.

059

– From the “Frame Environment” window, power on the power modules by clicking on the On button corresponding to the first power module.
– Wait for the system monitor to update the “Frame Environment”window, then check for “dc Power Loss” (red) conditions for all power modules.

Are all power modules still indicating a “dc Power Loss” (red) condition?

Yes **No**

060

Some power modules are active.

(Step **060** continues)

060 (continued)
Are any indicating a "dc Power Loss" (red) condition?
Yes **No**

061

Problem resolved.
– Go to Step 077 on page 1-278 to verify fix.

062

Other problems exist.
– Go to Step 054 on page 1-274.

063

Possible short in 48 V dc power distribution.
– Go to Step 064

064

Possible short in 48 V dc power distribution.
– Switch all processor node and switch assembly circuit breakers to Off ('0') position.
– Disconnect dc distribution cables PDU-BH-P1, PDU-BH-P2, PDU-BH-P3, PDU-BH-P4, and PDU-BH-P5 at SEPBU. This isolates 48 V dc to the SEPBU only.
– From the "Frame Environment" window, power on the power modules by clicking on the On button corresponding to the first power module.
– Wait for the system monitor to update the "Frame Environment"window, then check for "dc Power Loss" (red) conditions for all power modules.

Are all power modules still indicating a "dc Power Loss" (red) condition?
Yes **No**

065

– Probable short in dc distribution cables.
– Go to Step 009 on page 1-259, to continue service.

066

Is the power control interface (PCI) card switch (in the rear of the SEPBU, next to the frame supervisor card) in the AUX position?
Yes **No**

067

Probable dc short in the SEPBU.
– Put the circuit breaker in the front of each power module in the Off ('0') position.
– Unseat all power modules from the SEPBU so that they are out at least three inches (10 centimeters) from the SEPBU power chassis.
– One-at-a-time, reseat the power module(s) and put the circuit breaker of the power module in the On ('1') position.
– Check frame supervisor green LED #1 and/or green LED #2 for an OFF condition.
(Step **067** continues)

067 (continued)

Does frame supervisor green LED #1 and/or green LED #2 remain OFF following reseating of a power module?

Yes **No**

068

No problem detected for this power module.

Have all power modules been reseated?

Yes **No**

069

– Continue at last bullet of Step 067 on page 1-276.

070

All power modules reseated.

– Go to Step 077 on page 1-278 to verify fix.

071

Problem detected.

Is this the first power module to be reseated?

Yes **No**

072

Problem with power module.

– Refer to "Replacing the SEPBU Power Module" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to replace the SEPBU power module.
– Replace this power module.
– Go to last bullet of Step 067 on page 1-276.

073

– Unseat this power module.
– Reseat a different power module.
– Put the circuit breaker of the reseated power module in the On (‘1’) position.
– Check frame supervisor green LEDs #1 and #2 for an OFF condition.

Does frame supervisor green LED #1 and/or green LED #2 remain OFF following reseating of a power module?

Yes **No**

074

Problem with original power module.

– Go to last bullet of Step 067 on page 1-276.

075

– Refer to "Replacing the SEPBU Power Control Interface (PCI) Card" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to replace the SEPBU power chassis.
– Go to Step 077 on page 1-278 to verify fix.

076

Probable problem related to PCI function.
– Go to "MAP 0470: SEPBU Power Control Interface" on page 1-280.

077

SEPBU has been serviced.
– Make sure all cables are reconnected at the rear of the SEPBU.
– Make sure the customer circuit breaker is in the On position.
– Make sure all power modules are installed in the SEPBU power chassis.
– Make sure the circuit breaker at the front of all power modules is in the On ('1') position.
– Make sure the main power switch is in the On ('1') position.
– Go to Step 078.

078

– From the "Frame Environment"window, make sure all installed power module indicator(s) show good status (green).
– From the "Frame Environment"window, check frame supervisor green LEDs and make sure both LEDs are constant On.

Are both conditions met?

Yes **No**

079

Problem(s) still exists.
– Go to Step 001 on page 1-265 to continue service.

080

Problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

081

Frame supervisor has detected a temperature beyond an acceptable range for the system.
– Check the air filter area (behind the front skirt) and around the SEPBU for obvious airflow blockage or external source of heat.

Is there obvious blockage or external source of heat?

Yes **No**

082

Frame supervisor card may be reporting incorrect temperature.
– Refer to "Replacing the SEPBU Frame Supervisor Card" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 084 on page 1-279 to verify fix.

083

– Remove blockage or source of heat from area.
– Go to "MAP 0570: End of Call" on page 1-357.

084

Problem resolved.

– Perform "Verification Test for Supervisor Bus" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does verification test pass?

Yes **No**

085

– Go to “MAP 0110: Supervisor Subsystem” on page 1-10 to continue service.

086

Problem resolved.

– Go to Step 077 on page 1-278.

MAP 0470: SEPBU Power Control Interface

001

Possible problem with the Power Control Interface.
– Locate the Power Control Interface (PCI) card on the SEPBU rear panel.
– Note where any power control cables are connected at the PCI card before continuing.
– Note the position of the local/auxiliary switch.

Is the switch in the local position?

Yes **No**

002

Does the customer have power control interface cables installed?

Yes **No**

003

– Put the local/auxiliary switch in the local position.
– Check frame supervisor green LED #2 (dc OK) for a solid ON condition.

Does frame supervisor green LED #2 (dc OK) show a solid ON condition?

Yes **No**

004

– Go to Step 007

005

Problem resolved.
– Go to Step 023 on page 1-282 to verify fix.

006

– Go to Step 012 on page 1-281

007

Possible problem with the PCI card.
– Put the main power switch in the Off (‘0’) position.
– Refer to "Replacing the SEPBU Power Control Interface (PCI) Card" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Ensure the PCI card switch is in the original position.
– Put the main power switch in the On (‘1’) position.
– Check frame supervisor green LED #2 (dc OK) for a solid ON condition.

Does frame supervisor green LED #2 (dc OK) show a solid ON condition?

Yes **No**

008

– Refer to "Replacing the SEPBU Frame Supervisor Card" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Check frame supervisor green LED #2 (dc OK) for a solid ON condition.

(Step **008** continues)

008 (continued)

Does frame supervisor green LED #2 (dc OK) show a solid ON condition?

Yes **No**

009

Problem is in SEPBU power chassis.

DANGER

> **High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove all power to the frame.**

– Power off system.
– Refer to "Replacing the SEPBU Power Control Interface (PCI) Card" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* to replace the SEPBU power chassis.
– Reconnect ac power and power on the system.
– Go to Step 023 on page 1-282 to verify fix.

010

Problem resolved.
– Go to Step 023 on page 1-282 to verify fix.

011

Problem resolved.
– Go to Step 023 on page 1-282 to verify fix.

012

Remote power control cables are installed and local/auxiliary switch is in the auxiliary position.
– Trace power control cables back until you find the first remote unit that is powered on or in the local position.

Is this remote unit powered on?

Yes **No**

013

– Power on this remote unit.
– Check frame supervisor green LED #2 (dc OK) for a solid ON condition.

Does frame supervisor green LED #2 (dc OK) show a solid ON condition?

Yes **No**

014

– Go to Step 001 on page 1-280.

015

Problem resolved.
– Go to Step 023 on page 1-282 to verify fix.

016

– Check the power control cable from this powered remote unit to the next unpowered unit.
– If there is an obvious problem, such as a loose cable, fix the obvious problem; otherwise, replace this power control cable.

Are you able to power on this unit?

Yes **No**

017

There may be a problem with this unpowered unit's power control interface.

Is this unit a RS/6000 SP?

Yes **No**

018

– Service the unit using the appropriate documentation.
– As a temporary work-around, you may enable frames by putting their local/auxiliary switch in the local position.

019

First failing unit is a RS/6000 SP.

Is this the same frame that you were originally servicing in this PCI MAP?

Yes **No**

020

– Go to Step 001 on page 1-280 to service this frame.

021

– Go to Step 007 on page 1-280.

022

Unit is powered on.
– Go to Step 023.

023

The SEPBU frame supervisor LED #2 is On.
– Reconnect any power control cables at the PCI card as recorded in Step 001 on page 1-280.
– Go to Step 077 on page 1-278 to verify fix.

MAP 0480: Open in 48 V dc Distribution

Problem in 48 V dc power distribution to processor node(s) or switch assemblies.

001

Attention: The following step requires powering off up to three additional processor nodes or one additional switch assembly. If the switch feature is present, it will interrupt jobs on all switch features attached to the switch assembly on this frame.

Attention: If a 604 or 604e high node is present in this frame, it is possible that the 48 Volt power distribution is spread across more than one power harness. Check physical connections from circuit breaker(s) to 48 V bulkhead connectors for actual power distribution.

Replacing the power harness requires powering off up to four units. The sets are as follows:

```
PDU-BH-P1: Frame slots  1, 2, 3, 4
PDU-BH-P2: Frame slots  5, 6, 7, 8
PDU-BH-P3: Frame slots  9, 10, 11, 12
PDU-BH-P4: Frame slots 13, 14, 15, 16
PDU-BH-P5: Frame slot  17
```

– If the other processor node(s) or switch on this power harness are in use, schedule time with the customer where the entire set can be removed from the active configuration. If the customer decides to defer maintenance, go to “MAP 0570: End of Call” on page 1-357; otherwise, continue this step.
– Have customer remove the set of processor node(s) or switch assemblies from the active configuration.
– Put circuit breakers at front of the processor node(s) or switch assemblies in the Off (‘0’) position.
– Replace the appropriate power harness PDU-BH-P1, PDU-BH-P2, PDU-BH-P3, PDU-BH-P4, or PDU-BH-P5.
– After the power harness is replaced, put circuit breakers at front of the processor node(s) or switch assemblies in the ON (‘1’) position.
– Check Power (green) LED of the original processor node(s) or switch assemblies for an ON condition.

Is the Power (green) LED OFF for the original processor node(s) or switch assemblies?

Yes **No**

002

Problem resolved.
– Go to Step 008 on page 1-284.

003

Problem in the SEPBU or Power Distribution Unit dc section.

Attention: The following steps require interruption of all processor node(s) and/or switch assemblies in the frame. If the switch feature is present, it will interrupt jobs on all switches attached to the switch assemblies in this frame.

– Schedule time with customer where the frame can be powered off. If the customer decides to defer maintenance, go to “MAP 0570: End of Call” on page 1-357; otherwise continue this step.
– Put main power switch at front of frame in the Off (‘0’) position.

DANGER

High voltage present. Perform "Lockout/Tagout Procedure for PDU" on page 1-2 or "Lockout/Bagout Procedure for PDU" on page 1-3 to remove primary power to the frame.

Does this frame contain a power distribution unit (PDU)?

Yes **No**

004

Frame contains a SEPBU.
- Remove power modules and frame supervisor card from power chassis.
- Replace SEPBU power chassis.
- Reinstall frame supervisor card and power modules.
- Go to Step 006 to resume service.

005

Frame contains a power distribution unit.
- Open Power Distribution Unit dc section.
- Find the tailgate cable associated with the failing processor node(s) in the following table:

```
PDU-BH-P1: Frame slots  1, 2, 3, 4
PDU-BH-P2: Frame slots  5, 6, 7, 8
PDU-BH-P3: Frame slots  9, 10, 11, 12
PDU-BH-P4: Frame slots 13, 14, 15, 16
PDU-BH-P5: Frame slot  17
```

- Replace the appropriate tailgate cable PDU-BH-J1, PDU-BH-J2, PDU-BH-J3, PDU-BH-J4, or PDU-BH-J5 to the bus bars.
- Reinstall cover of Power Distribution Unit dc section.
- Go to Step 006.

006

- Reconnect power to the system.
- Put main power switch at front of frame in the On ('1') position.
- Put circuit breakers at the front of the processor node(s) and/or switch assemblies in the On ('1') position.

Do the processor node(s) or switch assemblies power on?

Yes **No**

007

- Call next level of support.

008

Problem resolved.

Does this frame only contain switch assemblies?

Yes **No**

009

Frame contains processor node(s).

(Step **009** continues)

009 (continued)
– Check the 3-digit LEDs for the processor nodes to make sure they are all IPLing okay.
Do all processor nodes IPL okay?
Yes **No**

010

Processor nodes not IPLed.
– Go to "MAP 0100: Start of Service Call" on page 1-4 to continue service.

011

Processor nodes have IPLed okay.
Does this frame contain a switch assembly?
Yes **No**

012

Problem resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

013

– Go to Step 014.

014

Frame contains switch assemblies.
– Go to Step 101 on page 1-350 of the "MAP 0540: Switch Function" on page 1-322 to verify fix.

MAP 0490: Network Problem

There are several communication adapters supported for node-to-node (network) communication, including:

Ethernet Thin (Coax)	Mandatory: Used for installation/boot LAN
Ethernet Thick	Mandatory: Used for installation/boot LAN
Ethernet TTP	Mandatory: Used for installation/boot LAN
Switch Adapter	Application high-speed node-to-node communication
Token-Ring	Customer use
FDDI (Fiber Optic)	Customer use

001

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 High Performance Switch (HiPS) feature or Scalable POWERparallel Switch (SPS) 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.

– Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing processor node(s) in/from service position.
– Refer to "Viewing Switch Partitions" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for locating and fencing/unfencing nodes within a switch partition.
– In order to service the LAN, you must determine the topology (wiring) of the LAN. Contact the System Administrator to obtain a copy of the machine's Ethernet topology. The topology tells you which processor nodes are connected together inside the frame, and where group(s) of processor nodes are connected outside the frame.
– Perform "Checking Network (LAN) Status" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 002.

002

– Based on the adapter name, use the following table to continue service:

Adapter Name	Network Type	Action
en	Ethernet Thin, Thick, TTP	Go to “MAP 0500: Ethernet LAN” on page 1-288.
css	Switch	Go to “MAP 0510: Switch Assembly” on page 1-294.
tr	Token Ring	Use the *Diagnostic Information for Multiple Bus Systems* (SA38-0509) and *Adapters, Devices and Cable Information for Multiple Bus Systems* (SA38-0516) or reference the related publications in the bibliography in *RS/6000 SP: Maintenance Information, Volume 1*.
fi	FDDI (Fiber Optic)	Use the *Diagnostic Information for Multiple Bus Systems* (SA38-0509) and *Adapters, Devices and Cable Information for Multiple Bus Systems* (SA38-0516) or reference the related publications in the bibliography in *RS/6000 SP: Maintenance Information, Volume 1*

MAP 0500: Ethernet LAN

Each processor node has at least one Ethernet LAN connection:

- Standard RS/6000 SP system (and coexistence 9076 SP1 system):

  Thin processor nodes: Integrated Ethernet connection (N00-BH-J5). Connects this processor node to the customer's LAN.

  Important Note for Thin Nodes with TTP

  The Ethernet riser card port on the thin node (and thin node 2) must be set to the "thick" position. See "Setting the Ethernet Riser Card Jumpers" in the Removal and Replacement section of *7012 POWERstation and POWERserver: Install and Service Guide* (SA23-2624) for details.

  Wide processor nodes: Micro Channel Ethernet connection (N00-MC-0/1). Connects this processor node to the customer's LAN.

  604 or 604e high processor nodes:
  Micro Channel Ethernet connection (N00-MC-1/1). Connects this processor node to the customer's LAN.

  SP-Attached Server S70 and S7A
  PCI Ethernet connection (ent0). connects this processor node to the customer's LAN.

  332 MHz SMP or POWER3 SMP nodes:
  Integrated Ethernet connection (not riser card). Connects this processor node to the customer's LAN.

- Additional Ethernet cards may be present in the I/O adapter slots.

Items covered in this MAP are for cabling with coax (BNC) connections or TTP connections:

- Integrated Ethernet card
- Micro Channel Ethernet card
- PCI Ethernet card
- Ethernet cabling inside the RS/6000 SP frame
- Ethernet connections outside the RS/6000 SP frame.
- Ethernet transceiver (TTP)
- MAU (TTP)

001

The factory default wiring topology for coax is similar to the following:

```
Terminator → Customer's LAN
   → (N02 → N01) → (N03 → N04) → (N06 → N05) → (N07 → N08)
   → (N10 → N09) → (N11 → N12) → (N14 → N13) → (N15 → N16)
   → Terminator
where:  N## refers to processor node number,
        Processor node pairs are in '()'s.
```

The wiring topology for TTP is similar to the following figure:

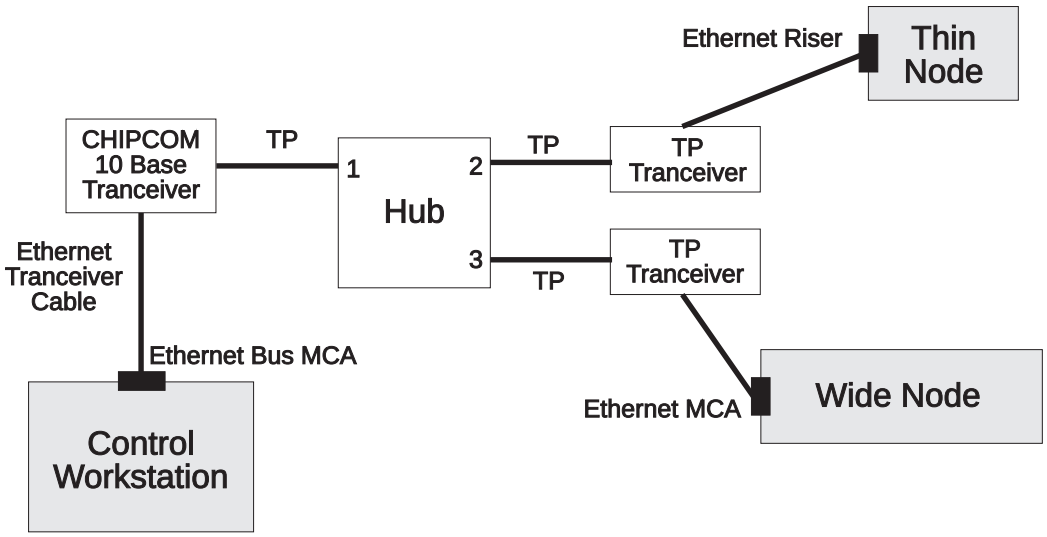


Figure 1-28. Typical Ethernet TTP Topology

–

Notes:

1. Actual customer topologies may differ from the diagrams above.
2. Both ends of the coax network must have a terminator.
3. If a problem is affecting multiple processor nodes, you need to know the topology (wiring) of the LAN to perform service. The topology should be shown on a worksheet attached in this manual. Any changes to the topology should be updated on this worksheet. If necessary, you may hand trace the Ethernet cabling in the system, where possible, to determine the topology. Keep in mind that a customer's configuration may consist of fewer processor nodes per LAN than the factory default shown above.

– Go to Step 002.

002

– Note which processor node(s) indicate a problem.
– Use the following table and the Ethernet LAN cabling worksheet from Step 001 on page 1-288 to continue service:

Priority	Condition	Action
1	Problem affecting all powered processor nodes on a single Ethernet LAN.	Go to Step 003 on page 1-290.
2	Problem affecting an individual **thin/wide** processor node's **integrated** Ethernet connection.	Go to Step 012 on page 1-291.
3	Problem affecting an individual processor node **I/O adapter card** connection.	Go to Step 014 on page 1-292.

003

Network problem.

– Check cabling connections along affected network and terminators at both ends of the LAN for any cabling/connector problems, such as poor connections, damaged or missing components.

Are there any cabling/connector problems?

Yes **No**

004

– Attempt to isolate failing cable(s), terminators, MUX connector, MAU connector, or T-adaptors by performing "Ethernet LAN Isolation Procedure" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* and return to this step.

Did the LAN isolation task locate a failing part?

Yes **No**

005

Could not locate failing part.

– Check system monitor on control workstation for continuing communication problem.

Is there still a communication problem?

Yes **No**

006

Problem resolved.

– Go to “MAP 0570: End of Call” on page 1-357.

007

– Call next level of support.

008

– Go to Step 009.

009

– Replace or reseat the failing part.

– Check the topology “Frame” window on the control workstation for indication that the Ethernet LAN problem has been resolved (Ethernet LAN connections for all powered processor nodes show green status).

Note: Refresh of this window may take up to five minutes.

Does the topology “Frame” window indicate green status for Ethernet LAN connections to all processor nodes that are powered on?

Yes **No**

010

– Go to Step 001 on page 1-288.

011

Problem resolved.

(Step **011** continues)

011 (continued)
– Go to “MAP 0570: End of Call” on page 1-357.

012

Problem affecting an individual thin processor node’s integrated Ethernet connection.
– Open the rear cover of the RS/6000 SP frame, and locate the proper processor node.
– Use the following table to reseat or replace components.

Priority	Component	Action
1	T-adaptor (coax) or TTP transceiver (N00-BH-J5)	1. Check the connection at the T-adaptor (coax) or TTP transceiver on the integrated Ethernet card (N00-BH-J5), and tighten as necessary. For TTP, also check cable and connection at the TTP HUB, and verify correct plug position. 2. Verify that internal and external cables are connected to the correct integrated or Micro Channel Ethernet card, respectively. 3. If no problem was found continue at Priority 2; otherwise, verify fix at Step 016 on page 1-292.
2	T-adaptor (coax) or TTP transceiver (N00-BH-J5)	Replace component. If no problem is found, go to Priority 3.
3	(Planar power problem)	1. From the control workstation, reset this processor node. 2. Check 3-digit LEDs for any non-blank condition during IPL. 3. If the 3-digit LEDs are always blank, go to Step 006 on page 1-51 to fix the planar power problem. Otherwise, continue at Priority 4.
4	Ethernet riser card	1. Put circuit breaker(s) at front of processor node in the Off (‘0’) position, then remove processor node from frame. 2. Remove processor node cover. 3. If a 332 MHz SMP or POWER3 SMP node, go to Priority 5. If other node, continue with next step. 4. Replace the integrated Ethernet riser card. 5. Continue at Step 013.
5	I/O planar card	1. Replace the I/O planar card. Make sure that all cards and cables are reinstalled properly following replacement. 2. Continue at Step 013.
6	All replaced	Call next level of support.

013

Component reseated or replaced.
– Reinstall processor node top cover.
– Reinstall processor node in frame. Make sure to reconnect cables at back of processor node.
– Put circuit breaker(s) at the front of processor node in the On (‘1’) position.
– Go to Step 016 on page 1-292 to verify fix.

014

Problem affecting individual processor node(s) I/O adapter card Ethernet connection.
– Verify with customer that jobs on this processor node are completed.
– **SP-attached servers** (RS/6000 Machine Types 7017 S70 and S7A), consult the *RS/6000 Enterprise Servers S70 and S7A Installation and Service Guide* to perform the required service action and return to this MAP Step 016.

Note: Before disconnecting cables or performing service actions on an SP-attached server, perform "Decoupling and Coupling Code for SP-Attached Servers" in *RS/6000 SP: Maintenance Information, Volume 3*.

– Open the rear cover of the RS/6000 SP frame, and locate the proper processor node.
– Use the following table to reseat or replace components:

Priority	Component	Action
1	T-adaptor (coax) or TTP transceiver on Micro Channel Ethernet card	1. Check the connection at the T-adaptor (coax) or TTP transceiver on the Micro Channel Ethernet card and tighten as necessary. 2. If no problem was found continue at Priority 2; otherwise, verify fix at Step 016.
2	(Planar power problem)	1. From the control workstation, reset this processor node. 2. Check 3-digit LEDs for any non-blank condition during IPL. 3. If the 3-digit LEDs are always blank, go to Step 006 on page 1-98 to fix the planar power problem. Otherwise, continue at Priority 3.
3	Ethernet adapter card	1. Put circuit breaker at front of processor node in the Off (‘0’) position. If this is a thin node, remove processor node from frame. 2. Remove processor node cover or open drawer. 3. Replace the Ethernet adapter card. 4. Continue at Step 015.
4	All replaced	Call next level of support.

015

Component reseated or replaced.
– If this is a thin/wide processor node, reinstall processor node top cover(s).
– Reinstall processor node in frame. Make sure to reconnect cables at back of processor node.
– Put circuit at the front of processor node in the On (‘1’) position.
– Go to Step 016 to verify fix.

016

– If you just replaced the I/O planar on a thin/wide processor node or the Ethernet adapter card, then perform "Updating the Ethernet Hardware Address" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* before continuing.
– If you just reseated or replaced a Ethernet adapter card, the customer **must** log into the processor node, using the TTY console. Log in as “root:”.
– Enter one of the following commands:

ifconfig en0 up

ifconfig en1 up

– From control workstation, issue **ping** command to this processor node.

ping *nodename*

– Check for response(s) indicating communication.

Does ping command indicate communication with this processor node?

Yes **No**

017

– Put circuit breaker at front of processor node in the Off (‘0’) position, then remove processor node from frame.
– Remove processor node cover.
– Return to appropriate table in Step 012 on page 1-291 or Step 014 on page 1-292 to continue service.

018

Communication has been established with the Ethernet connection for this processor node.

Are there other processor nodes with an Ethernet connection problem?

Yes **No**

019

Problem resolved.
– Go to “MAP 0570: End of Call” on page 1-357.

020

– Go to Step 001 on page 1-288.

MAP 0510: Switch Assembly

The switch features consist of the following components:

- Switch adaptor cards (one per processor node),
- Switch assembly
- Switch internal data cables (one per processor node) (HiPS 2.0 only)
- Switch internal clock cables (may not be required)
- Switch power cable
- Switch wrap plugs (male 46G5619 and female 46G5620 for HiPS, male 77G0818 and female 46H9688 for SPS). Refer to Figure 1-31 on page 1-299 and Figure 1-32 on page 1-300 for views of these wrap plugs.
- Switch external data cables (multi-frame only)
- Switch clock interposers (multi-frame only; may not be required) (HiPS 2.0 only)

Attention:

1. Switch data plug/jack connector pins are easily bent. Check for bent pins on male plugs or bent pin guides on female jacks if a cable is difficult to plug. Problems with bent pins or pin guides can propagate to new plugs/jacks if not corrected first.
2. All connected switch assemblies must be running from the same master clock. If the switch assemblies have not been set properly, all processor nodes in a logical frame will be uninitialized. Refer to "Selecting Appropriate Switch Clocks" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for these procedures.
3. Switch clock cables are fragile. Do not allow cables to bend too sharply or the cable may be permanently damaged.

Refer to Figure 1-29 on page 1-296 and Figure 1-30 on page 1-297 for high-level views of the RS/6000 SP High Performance Switch (HiPS) and Scalable POWERparallel Switch (SPS) assemblies.

Switch Connection Types

Standard Node Processor nodes in 9076 SP frames are attached to the switch assemblies with switch cables.

Dependent Node Switch adapter resides outside of the 9076 SP frame. Each dependent node is a single SP Switch Router Adapter in the 9077 Switch Router. There can be several dependent nodes in each SP Switch Router.

Switch-to-Switch Connections between switch assemblies.

Switch Assembly Types

HiPS 2.0 Has separate squared clock connectors (J35 and J36) at bulkhead. J35 provides clocks for processor nodes. J36 provides clock connections for switch-to-switch; in a system with HiPS 3.0 assemblies, clock interposers are used to route data cables J3, J5, and J7 to J36.

FRUs include: Fans, circuit breaker, LED card, complete assembly.

HiPS 3.0 All clocks are distributed through data cables (no J35 or J36). External clock inputs are selected from J3, J5, or J7.

FRUs include: Fans, circuit breaker, LED card, switch supervisor card, switch power card, switch clock card, complete assembly.

HiPS-LC8 Has only 8 ports (and cannot connect outside of a single frame). All clocks are distributed through data cables.

FRUs include: Fans, circuit breaker, LED card, switch supervisor card, switch power card, switch planar.

SPS All clocks are distributed through data cables. External clock inputs are selected from J3, J4, or J5.

FRUs include: Fans, circuit breaker/LED card, switch supervisor card, switch power card(s), inner chassis cable, front chassis cable, complete assembly.

SPS-8 There are only 8 ports. All clocks are distributed through data cables.

FRUs include: Fans, circuit breaker/LED card, switch supervisor card, switch power card(s), inner chassis cable, front chassis cable, complete assembly.

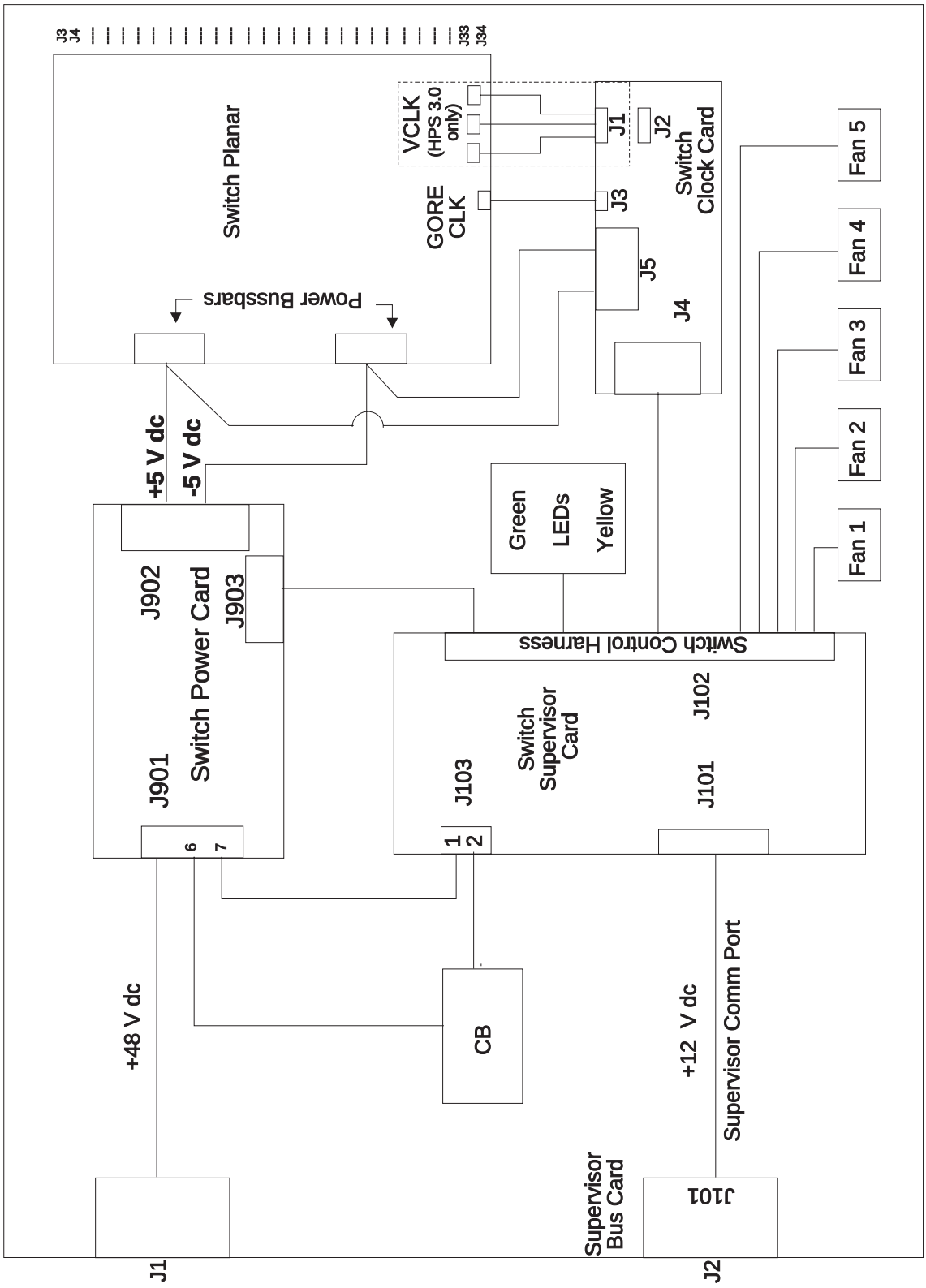


Figure 1-29. High Performance Switch (HiPS) Assembly High-Level Diagram

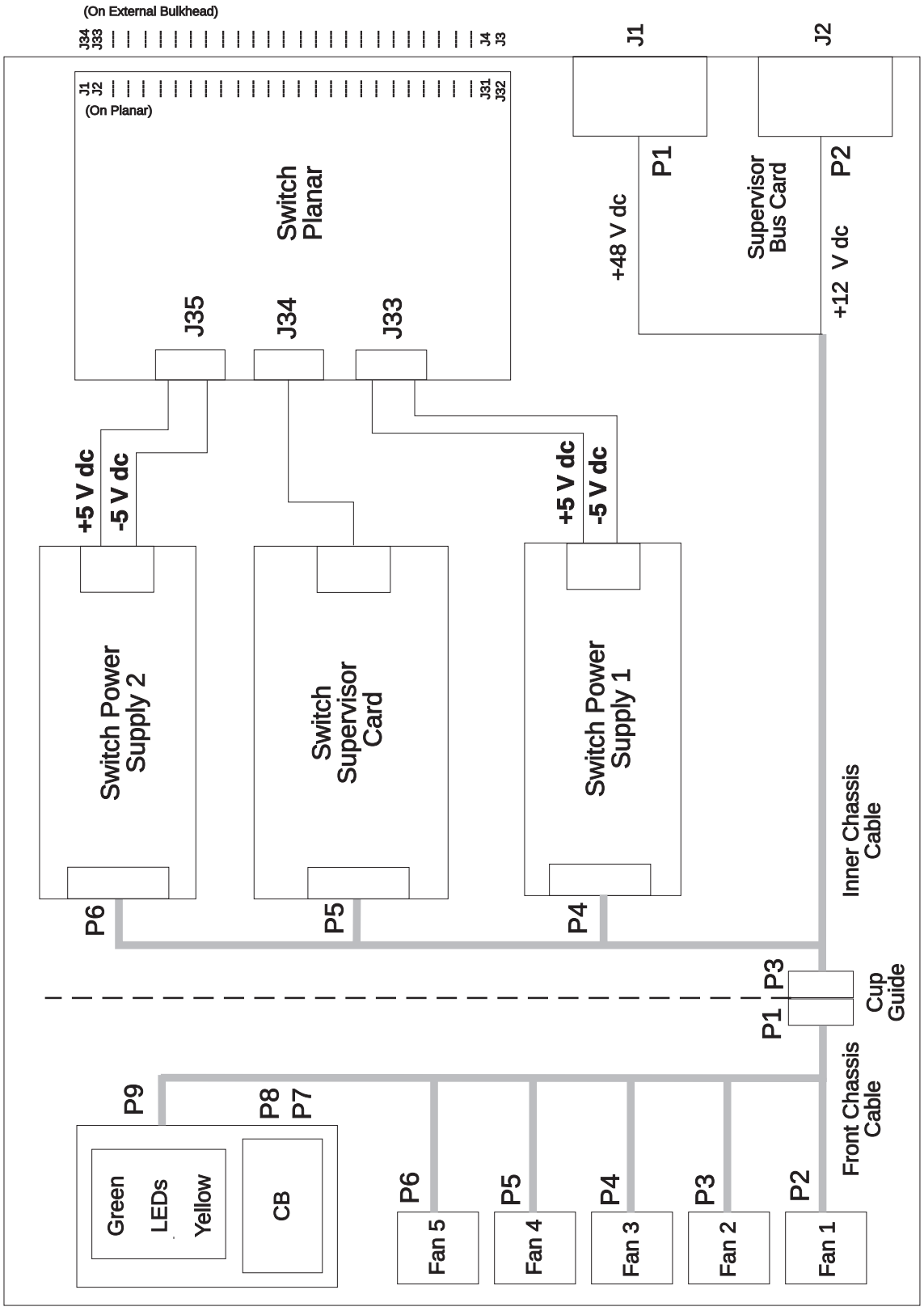


Figure 1-30. Scalable POWERparallel Switch (SPS) Assembly High-Level Diagram

There are two LEDs on the front of each switch assembly. For quick reference, their definitions are as follows:

Environment (Yellow)

Off	No environmental problems detected by switch supervisor card.
On	Warning of environmental condition out of nominal range. Preventative Maintenance should be scheduled for this switch.
Flashing	Serious environmental condition detected; power shut off.

Power (Green)

Off	No 48 V dc power available at switch assembly.
Flashing	Power available at switch assembly, but switch logic is Off.
On	Power available at switch assembly, and logic is On.

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing the switch assembly in/from service position.

001

– Read the following warning and then follow steps to ensure continuity of customer's jobs in the queue.

Attention: Servicing a processor node or switch assembly will interrupt customer usage of the processor node and the remainder of the high-performance switch network. If the high-performance switch feature must be replaced in a multi-frame system, refer to "Removing and Restoring Switch Resources" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, for information on isolating the switch assembly. The high-performance switch network can not be re-initialized until the switch assembly is physically isolated from the rest of the HiPS network.

Attention: It is possible that the customer has modified switch cabling from standard configurations; therefore, be careful about relying on node and frame information. Any connector jack numbers will be correct regardless of the customer's cable configuration, so you may trace the cabling from the jack number if necessary.

– Have customer complete all active parallel jobs, then remove the switch feature from the active configuration. Refer to "Removing and Restoring Switch Resources" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, for these procedures.
– Check for system monitor errors indicating environmental problems with the switch feature. These can be viewed by issuing the appropriate command from the control workstation:

pg /var/adm/spmon.log (For SSP code levels 1.00 - 1.01)
errpt -a -N sphwlog | pg (For SSP code levels 1.02 and higher)

In a frame with processor nodes, entries for the switch will refer to “node17” or “slot17”. In a multi-switch frame, switches will be listed as even slot addresses.

Note: Refer to Step 001 on page 1-4 for more information on the **pg** command.

– Determine the switch assembly type (see page 1-294).
– The following table contains a prioritized list of conditions. Find the first condition that describes your problem, then perform the associated action:

Priority	Message or condition	Action
1	Environmental problems • Errpt: “Failure...” • Log: “Shutdown: Voltage...” • Log: “Shutdown: Fan...” • Log: “Shutdown: Temperature...” • Errpt: “Warning...” • Log: “Warning:...” • Environment (Yellow) LED- on or flashing	Go to “MAP 0520: Switch Assembly Environment” on page 1-301.
2	Power problem • (Power) Green LED- off or flashing • Switch has no power • All voltages at zero	Go to “MAP 0530: Switch Assembly Power” on page 1-313.
3	Switch function problem • Error(s) in **/var/adm/SPlogs/css/out.top** (see note) • Problem(s) with **switch_responds** • Problem(s) returned from **errpt -a -N Worm** • Problem(s) detected by CE/customer.	Go to “MAP 0540: Switch Function” on page 1-322.

Notes:

1. **out.top** is located in the primary node. To find the primary node, issue:

   ```
   Eprimary
   ```

2. Verify that the file has a valid (recent) timestamp using:

   ```
   ls -l
   ```

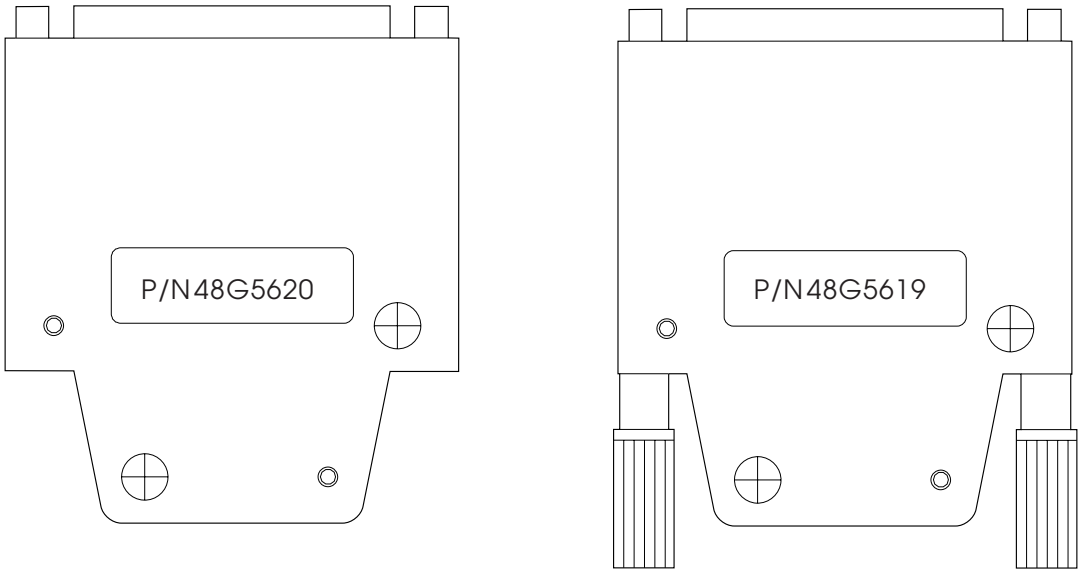
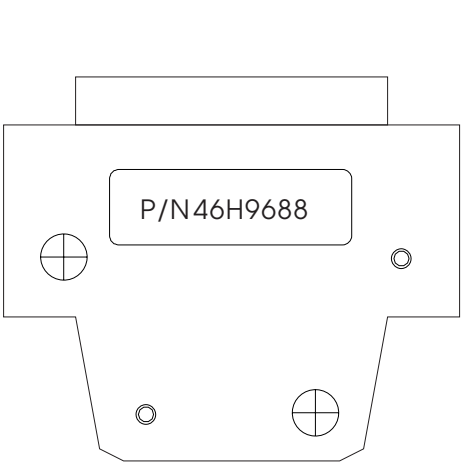
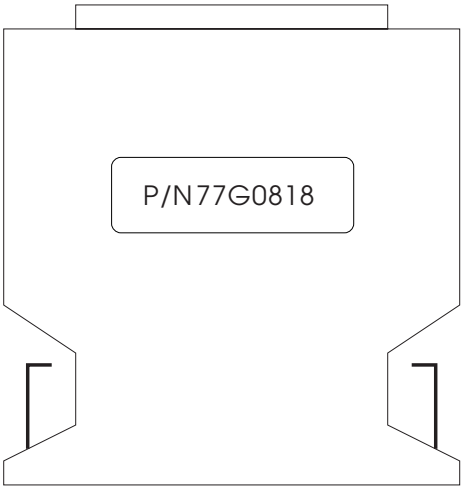


Figure 1-31. HiPS Wrap Plugs



Female Wrap Plug



Male Wrap Plug

Figure 1-32. SPS Wrap Plugs

Notes:

1. SPS advanced diagnostics use the 10 meter data cable provided by the SPS feature bill of material.
2. Advanced cable wrap tests will not run successfully for 15- and 20-meter SPS data cables. If 15- or 20-meter data cables are used, swap/change the suspected cable.

MAP 0520: Switch Assembly Environment

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing the switch assembly in/from service position.

001

– System monitor log reports “Warning”, “Shutdown”, or “Failure” message associated with switch assembly.

Does message indicate “Shutdown” or “Failure”?

Yes **No**

002

Message is a warning only.

Does this same message occur on other switch assemblies or processor nodes?

Yes **No**

003

– Verify that the customer is not experiencing problems with this switch assembly. If no problems are being experienced, or this is an N+1 fan or power supply failure, then no immediate service is required, and can be deferred until a later date. If problems *are* being experienced, service can be performed now by returning to Step 001 and treating this message as a “Shutdown” or “Failure” message.

004

– Notify next level of support.

005

A serious environmental condition has been detected in the switch assembly.

Note: If service action has just been completed on this switch assembly, check for loose cables or shorted conditions in this component.

– Based on the text of the message, use the following table to continue service:

Condition	Action
“...P48OK...”	Go to “MAP 0530: Switch Assembly Power” on page 1-313.
“...shutdownP5...” “...shutdownP12...” “...shutdownN5...”	Go to Step 006 on page 1-302.
“...fanfail...”	Go to Step 019 on page 1-304.
“...shutdownTemp...”	Go to Step 023 on page 1-306.
“...PS1Fail...” “...PS2Fail...” “...P33High...” “...P33Low...” “...voltP33Range...” “...PSFuseGood...”	Go to Step 031 on page 1-308.

006

– One or more of the following conditions exist:

- Voltage out of range: +5 V “shutdownP5”
- Voltage out of range: +12 V “shutdownP12”
- Voltage out of range: –5 V “shutdownN5”

– Have the customer remove the switch assembly from the active configuration and power off the switch assembly.
– Put the switch into service position. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Check cable conditions at switch supervisor card S00-SP-J102 and power card S00-PC-J903. Check condition of cable wires, especially J903 pin A5 to J102 pin A3, and the appropriate connection (based on message) shown below:

Voltage	Power Card - J903	Switch Supervisor - J102
+5 V	S00-PC-P903 pin B2	S00-SP-P102 pin A6
+12 V	S00-PC-P903 pin A3	S00-SP-P102 pin A5
–5 V	S00-PC-P903 pin A1	S00-SP-P102 pin A7

– Leave cable disconnected at switch power card.

Does the switch supervisor control cable appear to be okay?

Yes **No**

007

Problem with switch supervisor control cable (S00-SP-P102).
– Go to Step 019 on page 1-304, Priority 4, to replace cable.

008

– Disconnect S00-PC-P902 at power card.
– Using a digital multimeter, measure resistance between the appropriate pins.
– Compare results with values in this table:

Voltage	Measure From (positive lead)	To GND (negative lead)	Acceptable Range (in ohms)
+5 V(note)	Pin 1(note)	Pin 2 (black)(note)	1K - 5M(note)
+12 V	Pin 3	Pin 2 (black)	1K - 5M
–5 V(note)	Pin 5(note) Pin 7	Pin 2 (black)(note) Pin 2 (black)	2 - 20(note) 2 - 20
Note: HiPS-LC8 switch assembly has only +5 V (pin 1) and -5 V (pin 5).			

Is the measured resistance(s) in the acceptable range?

Yes **No**

009

– If this is an HiPS-LC8 switch assembly, skip directly to Step 010 on page 1-303
(Step **009** continues)

009 (continued)
– Disconnect S00-CL-P5 at switch clock card.
– Repeat resistance measurement from Step 008 on page 1-302.
Is the measured resistance(s) in the acceptable range?
Yes **No**

010

– Check the following for shorts or opens:
  - Metal busbars on switch planar (HiPS 2.0 or HiPS 3.0 only)
  - Cable S00-CL-P5 (HiPS 2.0 or HiPS 3.0 only)
  - Cable S00-PC-P902
  - Cable S00-PC-P11 (HiPS-LC8 only)

– Repair or replace cables as required.
– Repeat resistance measurement from Step 008 on page 1-302.
Is the measured resistance now in the acceptable range?
Yes **No**

011

Problem is in switch planar.
– If this is an HiPS 2.0 or HiPS 3.0, replace switch assembly.
– If this is an HiPS-LC8, replace switch planar.
– Go to Step 030 on page 1-307 to verify fix.

012

Problem resolved.
– Go to Step 030 on page 1-307 to verify fix.

013

– If this is an HiPS 2.0, replace switch assembly.
– If this is an HiPS 3.0, replace the switch clock card.
– Go to Step 030 on page 1-307 to verify fix.

014

– Reconnect cable S00-PC-P903 at switch power card.
– Repeat resistance measurement from Step 008 on page 1-302.
Is the measured resistance(s) in the acceptable range?
Yes **No**

015

– Disconnect cable S00-SP-P102 at switch supervisor card.
– Repeat resistance measurement from Step 008 on page 1-302.
(Step **015** continues)

015 (continued)
Is the measured resistance(s) in the acceptable range?
Yes **No**

016

– Problem is in the switch supervisor control cable (S00-SP-P102).
– Go to Step 019, Priority 4, to replace cable.

017

– If this is an HiPS 2.0, replace switch assembly.
– If this is an HiPS 3.0 or HiPS-LC8, replace the switch supervisor card.
– Go to Step 030 on page 1-307 to verify fix.

018

– If this is an HiPS 2.0, replace switch assembly.
– If this is an HiPS 3.0 or HiPS-LC8, replace the switch power card and switch supervisor card.
– Go to Step 030 on page 1-307 to verify fix.

019

– One or more of the following conditions exist:
  - Warning Fan: “fanwarning1”, “fanwarning2”, ..., “fanwarning5”
  - Shutdown Fan: “fanfail1”, “fanfail2”, ..., “fanfail5”
– Have customer remove the switch assembly from the active configuration and power off the switch assembly.
– If this is an HiPS switch, place the switch into service position. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– If this is an SPS or SPS-8 switch, turn off the circuit breaker. Unplug cables connected to J1 and J2 at the rear of the switch assembly. Then remove the front panel assembly from the inner chassis.
– Use the following table to reseat or replace components:

Priority	Component	Action
1	Fan 1, 2, 3, 4 or 5	1. Check specified fan(s) for blockage or loose cable connection. 2. Fix any obvious problem(s). If none are found, continue at Priority 2. 3. Continue at Step 020 on page 1-306.
2	Fan 1, 2, 3, 4 or 5	1. Replace fan(s) as described in "FRU Removals and Replacements" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. 2. Continue at Step 020 on page 1-306.
3	Switch supervisor card or HiPS 2.0 assembly	1. If this is an HiPS 3.0, HiPS-LC8, SPS, or SPS-8, replace the card; otherwise, replace the HiPS 2.0 assembly. 2. Continue at Step 020 on page 1-306.
4	Switch supervisor control cable	1. If this is an HiPS or HiPS-LC8, replace the cable. Refer to Figure 1-33 on page 1-305, for cable connections. If this is an SPS or SPS-8, replace the cable. Refer to Figure 1-34 on page 1-306, for cable connections. 2. Continue at Step 020 on page 1-306.
5	All replaced	Call next level of support.

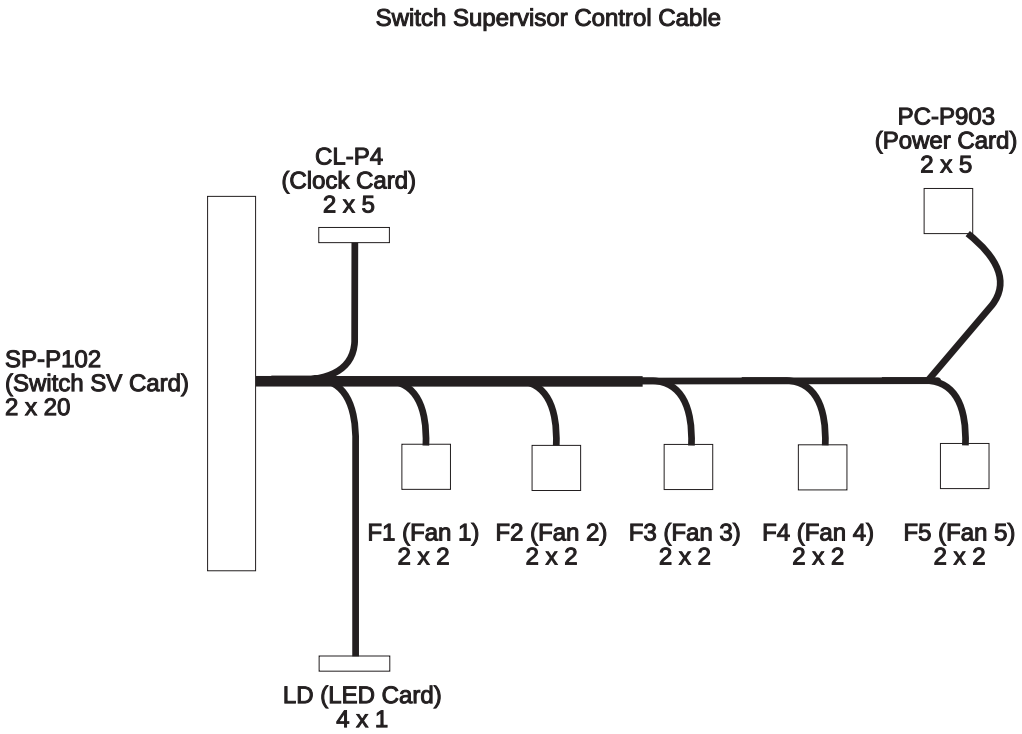


Figure 1-33. HiPS Switch Supervisor Control Cable

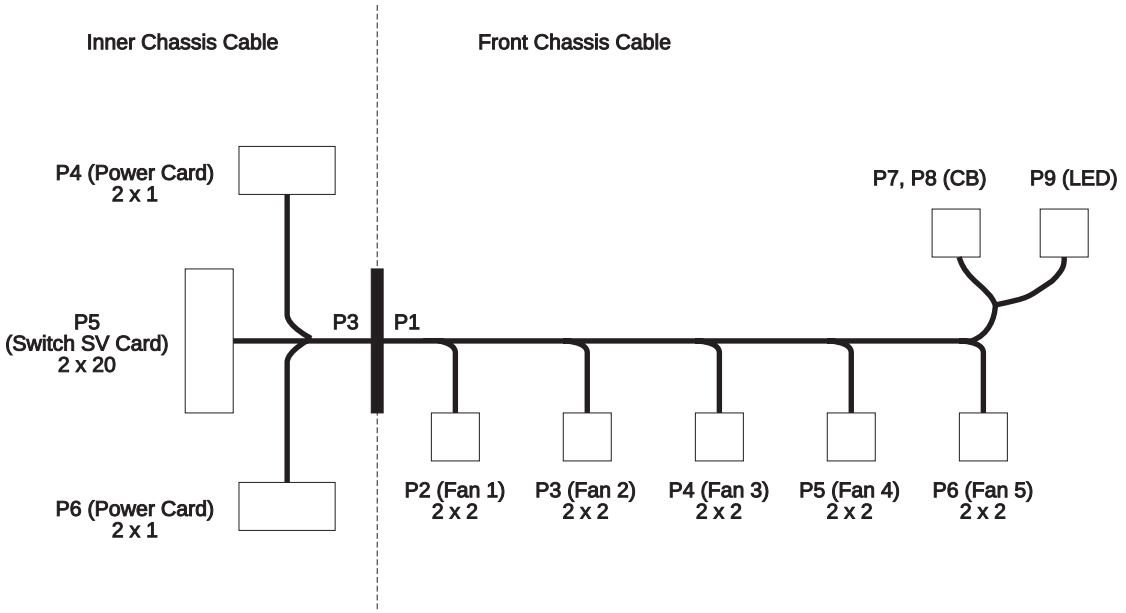


Figure 1-34. SPS Inner Chassis and Front Chassis Cables

020

Component replaced or reseated.

– Reconnect all cables inside the switch assembly.
– If this is an SPS or SPS-8, install front panel assembly and reinstall front retaining screws.
– If this is an HiPS or HiPS-LC8, replace the switch from service position. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Connect only power (J1) and supervisor (J2) cables at the rear of the switch assembly.
– Put circuit breaker at the front of switch assembly in the On (‘1’) position.
– Check the Environmental (yellow) LED for an ON or FLASHING condition.

Is the Environmental (yellow) LED ON or FLASHING?

Yes **No**

021

Problem resolved

– Go to Step 030 on page 1-307 to verify fix.

022

– Put circuit breaker at the front of the switch assembly in the Off (‘0’) position.
– Return to Step 019 on page 1-304 to continue service with the next highest priority.

023

Over temperature condition: “shutdownTemp”

Temperature is out of specified range; however, no serious electrical current or fan speed problems have been detected.

– Check for airflow blockage at air intakes and exhaust of the switch assembly and system frame. Also, check air temperature around the frame, looking for sources of abnormally high temperatures (above 40°C or 104°F).

Is there an obvious airflow blockage or abnormally high temperature source near air intakes?

Yes **No**

024

Problem in switch supervisor card.

- Have customer remove the switch from the active configuration and power off the switch assembly.
- If this is an HiPS or HiPS-LC8 switch, place the switch into service position. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
- If this is an SPS or SPS-8 switch, turn off the circuit breaker. Unplug cables connected to J1 and J2 at rear of the switch assembly. Then remove the front panel assembly from the inner chassis.
- If this is an HiPS 2.0, replace switch assembly.
- If this is an HiPS 3.0, HiPS-LC8, SPS, or SPS-8, replace the switch supervisor card.
- Perform "Node/Switch Supervisor Self-Test" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does card pass self-test?

Yes **No**

025

- Go to Step 028.

026

Switch supervisor card is okay.

- Check Environmental (yellow) LED for ON or FLASHING condition.

Is Environmental (yellow) LED ON or FLASHING?

Yes **No**

027

Problem resolved.

- Go to Step 030 to verify fix.

028

- Check cable connections to switch supervisor card. If no obvious problems are found, call next level of support.

029

- Have customer remove the switch from the active configuration and power off the switch assembly.
- Remove blockage. Put the switch into service position, if required. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
- With all cables replugged and Environmental (yellow) LED OFF, power on the switch assembly.
- Go to Step 030 to verify fix.

030

Component repaired or replaced.

- If necessary, reinstall switch assembly cover.
- Replace the switch from service position. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

(Step **030** continues)

030 (continued)
– If necessary, reconnect all cables at the rear of the switch assembly.
– Put circuit breaker at the front of the switch assembly in the On (‘1’) position.
– Go to Step 101 on page 1-350.

031

– One or more of the following conditions exist:

- “...P33Low...”
- “...P33High...”
- “...Pvolt33Range...”
- “...PS1Fail...”
- “...PS2Fail...”
- “...PSFuseGood...”

– Have the customer remove the switch assembly from the active configuration and power off the switch assembly.
– Switch off the circuit breaker. Unplug cables connected to J1 and J2 at rear of the switch assembly. Then remove the front panel assembly from the inner chassis.
– Put the switch into service position. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.

Does condition state a P33 type problem?

Yes **No**

032

Condition is PSxFail or PSxFuseGood.
– Go to Step 042 on page 1-309.

033

Condition is P33Low, P33High, or voltP33Range.
– Check cable conditions at switch supervisor card S00-SC-P5 and switch power card(s) S00-PC-P4 and S00-PC-P6.

Does the inner chassis cable appear to be okay?

Yes **No**

034

Problem with inner chassis cable.
– Go to Step 019 on page 1-304, Priority 4, to replace cable.

035

Condition is P33 type.

Does condition state P33low or voltP33Range?

Yes **No**

036

Condition is P33High.
– Go to Step 053 on page 1-311

037

(Step **037** continues)

037 (continued)
– Disconnect connectors S00-PC-P4, S00-PC-P6 at the power card(s) and S00-PC-P5 at the supervisor card. Remove the switch supervisor card. Refer to "Removing the Switch Supervisor Card (HiPS 3.0, HiPS-LC8, SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Using a digital multimeter, measure resistance at the planar connection for the supervisor card, between pins 12A and 12B. The resistance should be in a range of 4 to 20 ohms.

Is the measured resistance(s) in the acceptable range?

Yes **No**

038

– Remove power supply card PS1.
– Repeat measurement from Step 037 on page 1-308.

Is the measured resistance(s) in the acceptable range?

Yes **No**

039

– If this is the first time through this step, remove power supply card PS2 and go to Step 037 on page 1-308 to repeat measurement.
– Otherwise, replace switch assembly. Refer to "Removing the Switch Assembly" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 030 on page 1-307.

040

– Replace power supply card. Refer to "Removing the Switch Power Card(s) (HiPS 3.0, HiPS-LC8, SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 030 on page 1-307.

041

– Replace supervisor card. Refer to "Removing the Switch Supervisor Card (HiPS 3.0, HiPS-LC8, SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 030 on page 1-307.

042

Problem with PSxFail or PSxFuseGood.

Is this a PSxFail problem?

Yes **No**

043

Problem with PSFuseGood.
– Go to Step 053 on page 1-311

044

(Step **044** continues)

044 (continued)
Is this a PS1Fail problem?
Yes **No**

045

– Replace power supply card PS2. Refer to "Removing the Switch Power Card(s) (HiPS 3.0, HiPS-LC8, SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Reinstall the SPS front panel assembly, being careful to align the guide pins on the P1 to the inner chassis cup guide.
– Replug the power cable (J1) and supervisor cable (J2) to the rear of the assembly.
– Put the circuit breaker in the on (‘1’) position.

Does the PS2Fail condition still exist?
Yes **No**

046

– Go to Step 030 on page 1-307.

047

– Go to Step 050.

048

– Replace power supply card PS1. Refer to "Removing the Switch Power Card(s) (HiPS 3.0, HiPS-LC8, SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Reinstall the SPS front panel assembly, being careful to align the guide pins on the P1 to the inner chassis cup guide.
– Replug the power cable (J1) and supervisor cable (J2) to the rear of the assembly.
– Put the circuit breaker in the on (‘1’) position.

Does the PS1Fail condition still exist?
Yes **No**

049

– Go to Step 030 on page 1-307.

050

– Put the circuit breaker in the Off (‘0’) position?
– Remove the power cable (J1) and supervisor cable (J2) from the rear of the switch assembly. Then remove the front panel assembly.
– Replace the supervisor card. Refer to "Removing the Switch Supervisor Card (HiPS 3.0, HiPS-LC8, SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Reinstall the SPS front panel assembly, being careful to align the guide pins on the P1 to the inner chassis cup guide.
– Replug the power cable (J1) and supervisor cable (J2) to the rear of the assembly.
– Put the circuit breaker in the On (‘1’) position?

(Step **050** continues)

050 (continued)
Does the PSxFail condition still exist?
Yes **No**

051

– Go to Step 030 on page 1-307.

052

–

HiPS 2.0, HiPS 3.0, or HiPS-LC8	Replace switch assembly (see "Procedures for Switch Assemblies" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*).
SPS or SPS-8	Replace inner chassis assembly (see "Procedures for Switch Assemblies" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*).

– Go to Step 030 on page 1-307.

053

– Remove power supply PS1. Refer to "Removing the Switch Power Card(s) (HiPS 3.0, HiPS-LC8, SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Reinstall the SPS front panel assembly, being careful to align the guide pins on the P1 connector to the inner chassis.
– Replug the power cable (J1) and supervisor cable (J2) at the rear of the assembly.
– Put the circuit breaker in the On (‘1’) position.
Does the failure condition still exist?
Yes **No**

054

– Put the circuit breaker in the Off (‘0’) position.
– Remove power cable (J1) and supervisor cable (J2) from the rear of the switch assembly. Then remove the front panel assembly.
– Replace power supply PS1. Refer to "Removing the Switch Power Card(s) (HiPS 3.0, HiPS-LC8, SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Replace switch from the service position. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 030 on page 1-307.

055

– Put the circuit breaker in the Off (‘0’) position.
– Remove power cable (J1) and supervisor cable (J2) from the rear of the switch assembly. Then remove the front panel assembly.
– Replug power supply PS1 and remove power supply PS2.
– Reinstall the SPS front panel assembly, being careful to align the guide pins on the P1 connector to the inner chassis.
– Replug the power cable (J1) and supervisor cable (J2) at the rear of the assembly.
– Put the circuit breaker in the On (‘1’) position.
(Step **055** continues)

055 (continued)
Does the failure condition still exist?
Yes **No**

056

– Put the circuit breaker in the Off (‘0’) position.
– Remove power cable (J1) and supervisor cable (J2) from the rear of the switch assembly. Then remove the front panel assembly.
– Replace power supply PS2. Refer to "Removing the Switch Power Card(s) (HiPS 3.0, HiPS-LC8, SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Replace switch from the service position. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 030 on page 1-307.

057

– Put the circuit breaker in the Off (‘0’) position.
– Remove power cable (J1) and supervisor cable (J2) from the rear of the switch assembly. Then remove the front panel assembly.
– Replug power supply PS2 and replace the switch supervisor card. Refer to "Removing the Switch Supervisor Card (HiPS 3.0, HiPS-LC8, SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Reinstall the SPS front panel assembly, being careful to align the guide pins on the P1 connector to the inner chassis.
– Replug the power cable (J1) and supervisor cable (J2) at the rear of the assembly.
– Put the circuit breaker in the On (‘1’) position.

Does the failure condition still exist?
Yes **No**

058

– Go to Step 030 on page 1-307.

059

–

HiPS 2.0, HiPS 3.0, or HiPS-LC8 Replace switch assembly (see "Procedures for Switch Assemblies" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*).

SPS or SPS-8 Replace inner chassis assembly (see "Procedures for Switch Assemblies" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*).

– Go to Step 030 on page 1-307.

MAP 0530: Switch Assembly Power

Note: Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing the high-performance switch in/from service position.

001

– From the system monitor on the control workstation or switch assembly, check the Power (green) LED for this switch assembly.

The definition of the Power (green) LED is as follows:

Power (Green)

Off	No 48 V dc power available at switch assembly.
Flashing	Power available at switch assembly, but switch logic is Off.
On	Power available at switch assembly, and logic is On.

Is Power (green) LED Off?

Yes **No**

002

Switch assembly getting 48 V dc power.

Is Power (green) LED flashing?

Yes **No**

003

Power (green) LED is On, indicating no problem with power supply.

– Verify that you have the proper switch assembly, then restart “MAP 0510: Switch Assembly” on page 1-294.

– If this is the proper switch assembly, call the next level of support.

004

Switch assembly is getting power.

– Power up switch logic from the virtual front panel on the control workstation.

Does Power (green) LED light and stay lit?

Yes **No**

005

Switch assembly not responding to the command.

– Go to “MAP 0110: Supervisor Subsystem” on page 1-10.

006

Switch logic getting power.

– Go to Step 101 on page 1-350.

007

– Check circuit breaker at front of switch assembly. Put this circuit breaker in the On (‘1’) position if it is not already.

(Step **007** continues)

007 (continued)

Does the circuit breaker go (trip) to the Off ('0') position?

Yes **No**

No:

008

– Go to Step 012 on page 1-315.

Yes:

009

– Have the customer remove the switch assembly from the active configuration and power off the switch assembly.
– Put the switch into service position. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– If this is an SPS or SPS-8, go to Step 036 on page 1-318
– If this is an HiPS or HiPS-LC8, check switch power harness (at power card P901 and circuit breaker) inside switch assembly for any obvious problems which might cause a short.

Does switch power harness appear okay?

Yes **No**

No:

010

– If this is an HiPS 2.0, replace the switch assembly.
– If this is an HiPS 3.0 or HiPS-LC8, fix obvious problems; if necessary, replace the switch power harness.
– Replace the switch from service position. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Reconnect switch assembly cables.
– Go to Step 007 on page 1-313.

Yes:

011

– Replace the switch from service position. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Using multimeter, check continuity between either tab of circuit breaker and a ground busbar (black wire attached) on the switch planar.
– Perform 'Actions' from table one-at-a-time until short disappears:

Order	Action	Replace
1	Unplug P102 from switch supervisor.	If this is an HiPS 2.0, replace switch assembly. If this is an HiPS 3.0 or HiPS-LC8, replace switch supervisor card. Refer to "Removing the Switch Supervisor Card (HiPS 3.0, HiPS-LC8, SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
2	Unplug P901 from power card.	S00-PC-P901 cable.
3	All unplugged.	If this is an HiPS 2.0, replace switch assembly. If this is an HiPS 3.0 or HiPS-LC8, replace switch power card.

– If "Action" removes short condition, replace the corresponding part in the "Replace" column.
– Reconnect switch assembly cables.
– Go to Step 007 on page 1-313.

012

(Step **012** continues)

012 (continued)
– From control workstation or switch assembly, check Power (green) LED for this node.
Is Power (green) LED Off?
Yes **No**

013

Switch assembly problem resolved.
– Go to Step 101 on page 1-350.

014

– Check processor node(s) or switch assemblies on any other dc power harness for any that are powered on. Ensure that the other processor node or switch assembly has its circuit breaker in the On ('1') position.
– Check the Power (green) LED for an On or Flashing condition.
– Processor node(s) and switch assemblies receive 48-volt power from one of five power harnesses. The sets are as follows:

```
PDU-BH-P1:   Frame slots  1, 2, 3, 4
PDU-BH-P2:   Frame slots  5, 6, 7, 8
PDU-BH-P3:   Frame slots  9, 10, 11, 12
PDU-BH-P4:   Frame slots 13, 14, 15, 16
PDU-BH-P5:   Frame slot  17
```

Is the Power (green) LED on other processor node(s) or switch assemblies On or Flashing?
Yes **No**

015

– Go to "MAP 0370: Main Power" on page 1-222.

016

– If there is only one switch assembly on the dc power harness, skip the next item and answer "Yes" to the question below.
– Check all other switch assemblies on the same dc power harness as the failing switch assembly to check for the same symptom - circuit breaker on but Power (green) LED not lit.
Is this the only switch assembly showing this symptom?
Yes **No**

017

Problem with 48 V dc power distribution.
– Go to "MAP 0480: Open in 48 V dc Distribution" on page 1-283.

018

– Check cable connections at PDU (see Step 014) and at switch assembly bulkhead (BH-J1) for good connections.
Are there good connections?
Yes **No**

019

– Fix cable connection problem.
– Go to Step 012.

020

– Have the customer remove the switch assembly from the active configuration and power off the switch assembly.

Is this an HiPS 2.0 or HiPS 3.0 switch assembly?

Yes **No**

021

– Go to Step 036 on page 1-318.

022

– Go to Step 023

023

– Put the switch assembly into the service position. Refer to "Removing a Switch Assembly into the Service Position" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Unplug 48 V dc harness from switch power card at S00-PC-P901.
– Using a digital multimeter, check for continuity from switch tailgate S00-BH-J1 pin 5 to plug S00-PC-P901 pin 2.

Is there continuity?

Yes **No**

024

– Check continuity between two tabs of switch assembly circuit breaker.

Is there continuity?

Yes **No**

025

– Replace switch assembly circuit breaker.
– Replug S00-PC-P901.
– Reinstall switch assembly in frame.
– Go to Step 007 on page 1-313 to verify replacement.

026

Problem with switch power harness inside switch assembly.
– Replace the switch power harness S00-PC-P901 inside this processor node.
– Replace the switch from service position. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 007 on page 1-313 to verify replacement.

027

– If this is an HiPS 2.0, replace switch assembly.
– If this is an HiPS 3.0 or HiPS-LC8, replace the switch power card.
– Replace the switch from service position (refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*), connecting only cables at S00-BH-J1 and S00-BH-J2.

(Step **027** continues)

027 (continued)
– Put circuit breaker at front of switch assembly in the On (‘1’) position.
– Check Power (green) LED for an OFF condition.
Is the Power (green) LED OFF?
Yes **No**

028

– Go to Step 033.

029

Problem not resolved.
Did you just replace the switch assembly or switch power card?
Yes **No**

030

– Put switch assembly into the service position again. (Refer to "Removing a Switch Assembly into the Service Position" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.)
– Replace the switch supervisor card.
– Replace the switch from service position (refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*), connecting only cables at S00-BH-J1 and S00-BH-J2.
– Put circuit breaker at front of switch assembly in the On (‘1’) position.
– Check Power (green) LED for an OFF condition.
Is the Power (green) LED OFF?
Yes **No**

031

– Go to Step 033.

032

– Put switch assembly into the service position again. (Refer to "Removing a Switch Assembly into the Service Position" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.)
– Replace the switch supervisor control cable. Refer to Figure 1-33 on page 1-305.
– Replace the switch from service position (refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*), connecting only cables at S00-BH-J1 and S00-BH-J2.
– Put circuit breaker at front of switch assembly in the On (‘1’) position.
– Check Power (green) LED for an OFF condition.
Is the Power (green) LED OFF?
Yes **No**

033

Problem resolved.
– Reconnect all cables at bulkhead of switch assembly.
– Go to Step 101 on page 1-350.

034

(Step **034** continues)

034 (continued)
Problem not resolved.
– Go to Step 035.

035

Problem with the 48 V dc power distribution to this switch assembly.
– Go to “MAP 0480: Open in 48 V dc Distribution” on page 1-283.

036

This is an SPS or SPS-8 assembly.
– Turn off the circuit breaker. Unplug cables connected to J1 and J2 at rear of the switch assembly. Then remove the front panel assembly from the inner chassis.
– Unplug inner chassis cable from the switch power card(s) S00-PC-P4, S00-PC-P6 and the switch supervisor card S00-SP-P5.
– Using a digital multimeter, check for inner chassis cable continuity from the switch tailgate and the connectors in the following table:

Table 1-9. Inner Chassis Cable Continuity

From	To
S00-BH_J1 pin 5&9	P6 pin 2
S00-BH-J1 pin 5&9	P4 pin 2
S00-BH-J1 pin 1&6	P3 pin 16
P3 pin 17	p6 pin 1
P3 pin 17	p4 pin 1

– On the fan assembly, with CB in the On (‘1’) position, check for front chassis cable continuity between the connectors in the following table:

Table 1-10. Front Chassis Cable Continuity

From	To
P1 pin 17	P1 pin 16

Is there continuity?
Yes **No**

037

Continuity check failed on a cable.
Did the front chassis cable fail the continuity check?
Yes **No**

038

Inner chassis cable failed test.
– Replace inner chassis cable. Refer to "Removing the Switch Inner Chassis Cable (SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
(Step **038** continues)

038 (continued)
– Go to Step 007 on page 1-313 to verify replacement.

039

Front chassis cable failed test.
– Ensure that the circuit breaker is in the On (‘1’) position. Then check for continuity between the tabs of the circuit breaker.

Is there continuity?

Yes **No**

040

– Replace the circuit breaker.
– Go to Step 007 on page 1-313 to verify replacement.

041

– Replace the front chassis cable. Refer to "Removing the Switch Front Chassis Cable (SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 007 on page 1-313 to verify replacement.

042

– If this is the first time through this step, replace the supervisor card. Refer to "Removing the Switch Supervisor Card (HiPS 3.0, HiPS-LC8, SPS, SPS-8)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. Then go to Step 007 on page 1-313 to verify replacement.
– If this is the second time through this step, replace the switch inner chassis. Refer to "Procedures for Switch Assemblies" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*. Then go to Step 007 on page 1-313 to verify replacement.
– Otherwise, go to “MAP 0480: Open in 48 V dc Distribution” on page 1-283

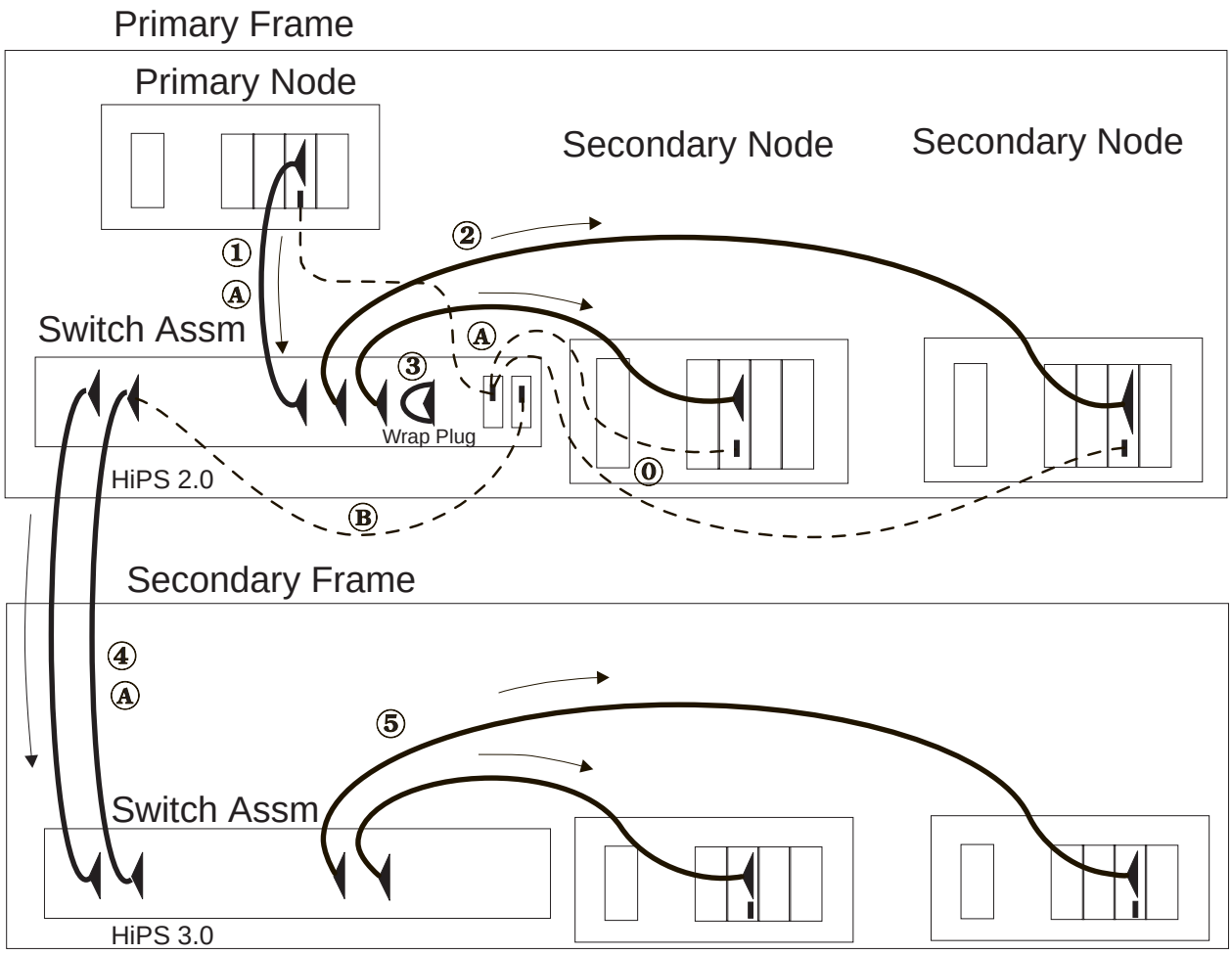


Figure 1-35. Switch Connectivity Diagram

Label A in diagram: Switch clocks may be distributed through discrete clock cables or within the switch data cables.

Label B in diagram: Clock interposer (P/N 93G1097) is used on HiPS 2.0 switch assemblies only. See Figure 1-36.

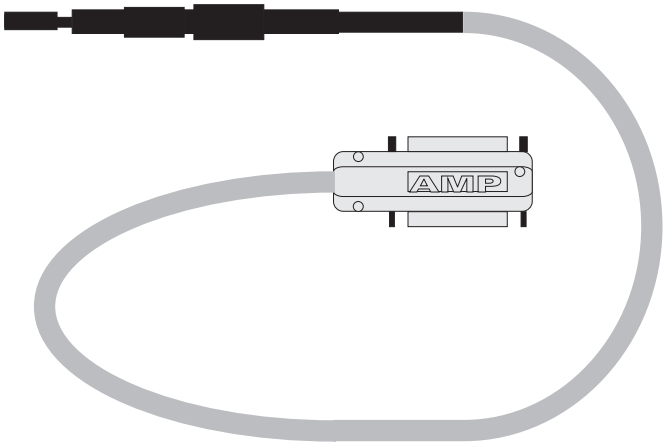


Figure 1-36. HiPS 2.0 Interposer

Switch initialization sequence

Label 0 in diagram:	Single clock source must be selected for the entire switch network. Refer to "Selecting Appropriate Switch Clocks" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, for additional information.
Label 1 in diagram:	Primary node communicates with switch assembly in primary frame.
Label 2 in diagram:	Connections to secondary nodes in primary frame are checked.
Label 3 in diagram:	Any wrap plugs/terminators in primary frame are checked.
Label 4 in diagram:	Switch assembly in primary frame communicates with switch assemblies in secondary frame(s) (if present).
Label 5 in diagram:	Connections to secondary nodes in secondary frame are checked.

MAP 0540: Switch Function

Notes:

1. Refer to “Appendix A” in *RS/6000 SP: Maintenance Information, Volume 1* for frame-to-frame or switch-to-switch cables. Logical frame to physical frame translation information can also be found in this appendix.
2. Refer to "HiPS 2.0/3.0 Node Data Cables" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for switch connections to primary and secondary processor nodes.
3. For the LC8, refer to "HiPS-LC8 Node Data Cables" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
4. Refer to "Service Position Procedures" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for placing or removing the high-performance switch in/from service position.

001

Possible functional problem with switch assembly.

Note: If **out.top** does not match the physical switch configuration, run **Eannotator**. (Refer to the Installation section of *IBM RS/6000 SP: Scalable POWERparallel Switch Support for the IBM PSSP for AIX* (GC23-3998).

– To complete the following procedures, you will need to have primary node root access. (Customer may enter root password when required.)
– If either of the following two conditions is true:

  - **Estart** has not been run by the customer
  - The CE has already replaced components that might affect the switch.

  then from the control workstation of the “primary” processor node, enter:

  Estart

  You should receive a message indicating successful initialization at the primary node. If you receive any other message, consult the “Diagnosing High Performance Switch Problems” section of *IBM Parallel System Support Programs for AIX: Diagnosis Guide*
– Determine the primary node number. From an AIX window on the control workstation, enter:

  Eprimary

– Determine the host name for this node by checking “reliable_hostname” for the node number with the command:

  splstdata -n | pg

– From the system file server, log into “primary” processor node as root using the **telnet** command:

  telnet *PrimaryNodename*

– Check **errpt -a -N Worm | pg** for any switch related problems. If any errors are listed, use the error information, with this MAP, to help isolate the problem.
– Check the functional state of the switch in the **out.top** file by issuing the following command on the “primary” processor node:

  pg /var/adm/SPlogs/css/out.top

  Notes:

  1. Verify that the timestamp on the **out.top** file is current (using **ls -l /var/adm/SPlogs/css/out.top**).

(Step **001** continues)

001 (continued)

2. Reference "MAP 0100: Start of Service Call" on page 1-4 for information on using the **pg** command.

– Problems are indicated at the end of a text line by the following sequence:

```
–# ErrorMessage
```

Examples of error messages:

```
-1    uninitialized
-3  R: faulty link from VOP
```

Does /var/adm/SPlogs/css/out.top file report any problems?

Yes **No**

002

No functional problems found.

Have you replaced component(s) or fixed problem(s)?

Yes **No**

003

Did Estart command start okay?

Yes **No**

004

– Consult the "Diagnosing High Performance Switch Problems" section of *IBM RS/6000 SP: Diagnosis and Messages Guide*.
– Go back to Step 001 on page 1-322

005

– Call next level of support.

006

All switch problems resolved.
– Go to "MAP 0570: End of Call" on page 1-357.

007

– Use the appropriate table of error conditions to continue service:

HiPS Error Conditions Table 1-11 on page 1-324

SPS Error Conditions Table 1-12 on page 1-327

Table 1-11 (Page 1 of 3). HiPS Error Conditions

Error #	Message/Condition	Description and Action
–1 (HiPS)	Uninitialized	Description: Switch adapter has not been initialized. Processor node may not recognize adapter due to hardware failure or bad software configuration. Action: 1. If there are any other errors in the **/var/adm/SPlogs/css/out.top** file, address those errors first. **Note:** If the problem is on all nodes in the frame, check for any hardware problems with the switch assembly. Also check for switch-to-switch problems on all jacks of the switch assembly. 2. If all the nodes are uninitialized except for the primary node, verify that the primary node is connected to the correct port. 3. Have customer verify that the correct switch software is installed and running on this node. **rc.switch** starts the **fault_service_Worm_RTG** daemon and the **fs_monitor** daemon. 4. Log into processor node and enter: **lscfg | grep css** 5. **If you get no result**, try swapping in another switch adapter. Repeat step 3. If you get a result, the problem is probably resolved; repeat Step 001 on page 1-322 for next problem or go to Step 101 on page 1-350 to verify fix. 6. Go to Step 008 on page 1-329.
–2 (HiPS)	Faulty link connected to input port, or device is powered off or has no clock.	Description: Outward link to input port has failure. Action: Go to Step 008 on page 1-329.
–3 (HiPS)	Faulty link from output port	Description: Return link from output port has failure. Action: Go to Step 008 on page 1-329.
–4 (HiPS)	Faulty link connected to both output and input ports	Description: Both outward and return links of the ports have failures. Action: Go to Step 008 on page 1-329.
–5 (HiPS)	Token timing test failed (probable switch element miswire)	Description: Initialization of this link failed. Action: 1. Check this connection against the actual hardware cabling. 2. **If this connection does match**, go to Step 008 on page 1-329. 3. Have the customer update the switch topology file or the hardware as appropriate. 4. Repeat Step 001 on page 1-322 for next problem or go to Step 101 on page 1-350 to verify fix.
–6 (HiPS)	Unexpected results from MSMU V dc scan service message	Description: Probable hardware problem. Action: Continue with Step 008 on page 1-329.

Table 1-11 (Page 2 of 3). HiPS Error Conditions

Error #	Message/Condition	Description and Action
–7 (HiPS)	Service phase worm dialog time-out	Description: Switch cannot contact fault_service daemon on processor node. Processor node may be hung or fault_service daemon not active. Action: 1. Have customer verify that the processor node is active and that the correct switch software (fault_service daemon) is active on this node. Example: Log into processor node and enter: **ps -ef | grep fault** 2. **If you get no result**, the fault_service daemon is not active. Contact next level of support, if necessary.
–8 (HiPS)	frame.slot mismatch (possible miswire)	Description: Initialization of this link detected a different switch node number than the one expected. Action: 1. Check this connection against the actual hardware cabling. 2. **If the cabling does not match**, correct the cabling problem, then go to step 5. 3. Check the processor node's hostname and switch node number against the configuration using the command: **splstdata -s | pg** 4. If this occurs on all nodes of a frame, check for a logical-to-physical frame number mismatch. 5. Have the customer update the configuration, or you can correct the cabling, as appropriate. 6. Go to Step 008 on page 1-329.
–9 (HiPS)	Software scan of switch element failed	Description: Probable hardware problem. Action: Go to Step 008 on page 1-329.
–10 through –15 (HiPS)	Switch ... RAM failed diagnostics	Description: Probable hardware problem. Action: Go to Step 008 on page 1-329.
–16 (HiPS)	Device may not be driven by the global oscillator (may be driven by internal clock)	Description: Initialization of this link failed due to possible clock synchronization problem. Action: Go to Step 008 on page 1-329.

Table 1-11 (Page 3 of 3). HiPS Error Conditions

Error #	Message/Condition	Description and Action
–17 (HiPS)	Node adapter has been replaced by wrap plug or cable	Description: Initialization detected a wrapped port where a processor node was expected. This may result from isolation procedures. Action: 1. **If this is an unexpected condition**, check cabling to processor node against the configuration file **/etc/SP/expected.top**. 2. **If the processor node can be reconnected**, remove the wrap plug and connect the data cable between the switch assembly and the processor node. 3. **If the processor node is to permanently removed**, have the customer update the configuration file **/etc/SP/expected.top**. 4. Repeat Step 001 on page 1-322 for next problem or go to Step 101 on page 1-350 to verify fix.
–18 (HiPS)	Link between devices is replaced by wrap plug or cable	Description: Initialization detected a wrap plug or cable rather than the expected cabling. Action: Same as for Error –17.
–19 (HiPS)	Dialog time-out during route table distribution	Description: Problem occurred during initialization which interfered with distribution route table to all processor nodes. Action: Same as for Error –7.
–20 (HiPS)	This link may have been wired improperly (see **/var/adm/SPlogs/css/cable_miswire** file	Description: Switch network not wired as specified in the switch topology. Action: 1. **If this is code level 1.00 - 1.01,** check for cabling problems. Go to step 4. 2. Check for cable errors from the primary processor node using the following command: **pg /var/adm/SPlogs/css/cable_miswire** 3. Check cables in order until a miswire is found, correcting any problems. 4. Repeat Step 001 on page 1-322 for next problem or go to Step 101 on page 1-350 to verify fix.

Table 1-12 (Page 1 of 3). SPS Error Conditions

Error #	Message/Condition	Description and Action
2 (SPS)	Initialized	Description: Initialization detected a wrapped port where a processor node or dependent node was expected (this may result from isolation procedures), or else a disconnected cable. Action: 1. **If this is an unexpected condition**, check cabling against the configuration file **var/adm/SPlogs/css/out.top**. 2. **If the processor node or dependent node can be reconnected**, remove the wrap plug and connect the data cable between the switch assembly and the processor node or dependent node. 3. **If the processor node or dependent node is to be permanently removed**, have the customer update the switch topology. 4. Repeat Step 001 on page 1-322 for next problem or go to Step 101 on page 1-350 to verify fix.
1 (SPS)	Link status: Operational	Description: Link status is operational. Action: Same actions as listed in Error # 2.
0 (SPS)	Uninitialized	Description: Switch adapter has not been initialized. Processor node may not recognize adapter due to hardware failure or bad software configuration. Action: 1. If there are any other errors in the **/var/adm/SPlogs/css/out.top** file, address those errors first. **Note:** If the problem is on all nodes in the frame, check for any hardware problems with the switch assembly. Also check for switch-to-switch problems on all jacks of the switch assembly. 2. If all the nodes are uninitialized except for the primary node, verify that the primary node is connected to the correct port. 3. Have customer verify that the correct switch software is installed and running on this node. **rc.switch** or **css_restart_node** starts the **fault_service_Worm_RTG_SP** daemon and the **fs_monitor** daemon. 4. Log into processor node and enter: **lscfg | grep css** 5. **If you get no result**, try swapping in another switch adapter. Repeat step 3. If you get a result, the problem is probably resolved; repeat Step 001 on page 1-322 for next problem or go to Step 101 on page 1-350 to verify fix. 6. The problem is probably the switch assembly. Go to Step 008 on page 1-329.

Table 1-12 (Page 2 of 3). SPS Error Conditions

Error #	Message/Condition	Description and Action
–1 (SPS)	Device status: Device not responding Link status: Link as been removed from network, other stage faulty	Description: Possible hardware problem. Action: Go to Step 008 on page 1-329.
–2 (SPS)	Link status: Wrap plug is installed	Description: Initialization detected a wrap plug or cable rather than the expected cabling. Action: Same as for Error 2.
–3 (SPS)	Device status: Device has been removed from network because of a bad signature Link status: Not operational	Description: Possible hardware problem. Action: Go to Step 008 on page 1-329.
–4 (SPS)	Device status: Device has been removed from network, faulty Link status: Link has been removed from network or mis-wired, faulty	Description: Switch network not wired as specified in switch topology or problem with connection between switch and device. **Note:** You may get this error number for a jack which could connect to a node, but instead has a wrap plug. In this case, this message is a warning only and can be ignored. Action: 1. Check this connection against the actual hardware cabling. 2. **If the cabling does not match**, correct the cabling problem, then go to step 5 below. 3. Check the processor node's hostname and switch node number against the configuration using the command: **splstdata -s | pg** **SDRGetObjects DependentNode** 4. If this occurs on all nodes of a frame, check for a logical-to-physical frame number mismatch. 5. If there is a mismatch, have the customer update the configuration, or you can correct the cabling, as appropriate. 6. Go to Step 008 on page 1-329.
–5 (SPS)	Send packet from local node failed	Description: Possible hardware problem. Action: Go to Step 008 on page 1-329.
–6 (SPS)	Device status: Device has been removed from network, no AUTOJOIN Link status: Link has been removed from network, no AUTOJOIN	Description: AUTOJOIN was not selected for node during removal. Action: 1. If there is an obvious problem, like node powered off or disconnected, fix that problem first. Then issue **Eunfence** for this processor node or dependent node. 2. If problem was resolved, repeat Step 001 on page 1-322 for next problem or go to Step 101 on page 1-350 to verify fix. 3. If problem was not resolved, go to Step 008 on page 1-329.

Table 1-12 (Page 3 of 3). SPS Error Conditions

Error #	Message/Condition	Description and Action
–7 (SPS)	Device status: Device has been removed from network for not responding Link status: Link has been removed from network, fenced	Description: Possible hardware problem. Action: Go to Step 008 on page 1-329.
–8 (SPS)	Device status: Device has been removed from network because of a miswire Link status: Link has been removed from network, probable miswire	Description: Initialization of this link detected a different switch node number than the one expected. Action: 1. Check this connection against the actual hardware cabling. 2. **If the cabling does not match**, correct the cabling problem, then go to step 5. 3. Check the node's hostname (or IP address) and switch node number against the configuration using the command: **splstdata -s | pg** (standard node) **SDRGetObjects DependentAdapter** (dependent node) 4. If this occurs on all nodes of a frame, check for a logical-to-physical frame number mismatch. 5. Have the customer update the configuration, or you can correct the cabling, as appropriate. 6. Repeat Step 001 on page 1-322 for next problem or go to Step 101 on page 1-350 to verify fix.
–9 (SPS)	Device status: Destination not reachable Link status: Link has been removed from network, not connected	Description: Possible hardware problem. Action: Go to Step 008 on page 1-329.

008

Functional problems reported in **/var/adm/SPlogs/css/out.top** file. This file lists all switch data connections with comment lines indicating the various types.

– Check the entire **/var/adm/SPlogs/css/out.top** file for errors before proceeding to the prioritized table.
– Use the following prioritized table to service problems reported in the **/var/adm/SPlogs/css/out.top** file. The messages are from comment lines preceding the error.

Notes:

1. Be aware that wrap plugs or terminators used in the following steps can potentially fail; therefore, exercise caution before performing major replacements to make sure that a diagnostic wrap plug or terminator is not faulty.
2. Where applicable, frame and switch assembly jack numbers are indicated on each line of the **out.top** file. (Refer to "Format Structure" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for more information on the nomenclature.)

   For example:

   L01-S00-BH-J18 identifies Logical frame 1, S00-BH-J18

   E02-S00-BH-J18 identifies Physical frame 2, S00-BH-J18

L03-N01	identifies Logical frame 3, Node 1
E02-N04	identifies Physical frame 2, Node 4
S01-S02-BH-J3	identifies Multi-switch frame 1, slot 2, BH-J3

Refer to notes at beginning of "MAP 0540: Switch Function" on page 1-322 for more information on cable connections and logical-to-physical frame translations.

3. Be aware that for logical frames consisting of two physical frames, all **out.top** even-numbered nodes represent nodes physically located in the expansion frame (F/C 1010) but at the next lower slot number. For example, L01-N04 (logical frame 1, node 4) could be physically located at E02-N03 (physical frame 2, slot 3).

Priority	Message/Condition	Action
1	• "On board connections..."	Go to Step 093 on page 1-349 to replace the switch assembly.
2	• "Primary node connection..." • "Node connections..." on same switch as primary node	• If this is a standard node, go to Step 009 to check "primary" or "secondary" processor node connection. • If this is a dependent node (connection to router), go to "MAP 0550: Dependent Node" on page 1-351.
3	• "Wrapped ports" • "frame # to frame #" • "switch # to switch #" • "Switch connections..."	Go to Step 042 on page 1-340 to check the wrapped port or external switch connection.
4	• "Node connections..." not on same switch as primary node.	• If this is a standard node, go to Step 009 to check "secondary" processor node connection. • If this is a dependent node (connection to router), go to "MAP 0550: Dependent Node" on page 1-351.
5	• All problems in **/var/adm/SPlogs/css/out.top** file have been addressed.	Go to Step 101 on page 1-350.

009

The **/var/adm/SPlogs/css/out.top** file indicates a problem with a "Primary node" or "Secondary node" connection.

– Open frame rear cover and check the cable connection from the indicated switch assembly jack to the processor node.

Is there a cable connected to the indicated jack on the switch assembly?

Yes **No**

010

No cable connected at the indicated jack. Refer to the table in "HiPS 2.0/3.0 Node Data Cables" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, as required.

(Step **010** continues)

010 (continued)

Should there be a cable connecting the indicated jack to a processor node?

Yes **No**

011

– Make sure a wrap plug is properly installed on the connector. Refer to Figure 1-31 on page 1-299 and Figure 1-32 on page 1-300 for views of the switch wrap plugs.
– Have customer check (and update if necessary) the switch configuration file appropriately before continuing:
  - For code levels 1.00 - 1.01, modify the **/etc/SP/expected.top** on the primary node.
  - For code level 1.02 and higher, use the **Etopology** command.

Did you just correct a problem with a wrap plug or correct the switch configuration?

Yes **No**

012

– Go to Step 093 on page 1-349 to service or replace the switch assembly.

013

– Go to Step 101 on page 1-350.

014

– Connect a switch data cable from this jack to the proper processor node.
– Go to Step 101 on page 1-350.

015

– Check cable connection at switch assembly and processor node.

Does the cable appear to be fully connected at the switch assembly and the processor node?

Yes **No**

016

– Fix cable connection problem.
– Go to Step 101 on page 1-350.

017

– From the front of the RS/6000 SP frame or from the control workstation, check the Power (green) LED on the processor node to make sure it is lit.

Is the Power (green) LED lit, indicating the processor node is powered on?

Yes **No**

018

Processor must be powered on for the switch to recognize the port.
– Power on this processor node, and check the Power (green) LED.
(Step **018** continues)

018 (continued)
Does the Power (green) LED stay lit, indicating the processor node is powered on?
Yes **No**

019

Processor node has a power problem.
– Go to “MAP 0130: Processor Node” on page 1-30 to fix problem.

020

– Go to Step 101 on page 1-350.

021

Processor node is powered on.
– Run advanced diagnostics in service mode on device “css0” on this processor node. Refer to "Running Diagnostics in a Processor Node" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, as required.
–

Notes:

1. Advanced cable wrap tests will not run successfully for 15- and 20-meter SPS data cables. If 15- or 20-meter data cables are used, swap/change the suspected cable.
2. Advanced “css0” diagnostics will require a male and a female wrap plug to perform the card wrap and cable wrap tests. When testing the SPS adapter, cable p/n 46H9699 will also be required to perform card diagnostics. This cable is part of the SPS feature bill of materials.
3. If unable to run diagnostics, reseat or replace the card.

Do you get a Service Request Number (SRN) from “css0” diagnostics?
Yes **No**

022

No problem detected by diagnostics; problem is in switch assembly.
– Go to Step 093 on page 1-349.

023

An SRN was obtained from diagnostics.
– Use the following SRN table to continue service:

Table 1-13 (Page 1 of 6). Service Request Number (SRN) Table for Switch Adapters

Service Request Number	SRN Source	Failing Component(s)	Description
762-100 through 762-199	D	SPS adapter software system or I/O planar	Problem detected with device or device data corrupted. You may need to reinstall “ssp.css” code.
762-200 through 762-299	D	external clock SPS adapter (wrap plug)	Problem detected with external clock.

Table 1-13 (Page 2 of 6). Service Request Number (SRN) Table for Switch Adapters

Service Request Number	SRN Source	Failing Component(s)	Description
762-2A0 through 762-2A9	D	SPS adapter	Problem detected with internal clock.
762-300 through 762-399	D	SPS adapter system or I/O planar	Problem detected with POS registers.
762-400 through 762-499	D	SPS adapter software	TBIC test failed.
762-500 through 762-599	D	SPS adapter	SRAM test failed.
762-600 through 762-699	D	SPS adapter	Microprocessor test failed.
762-700 through 762-799	D	SPS adapter	Interrupt test failed.
762-800 through 762-899	D	SPS adapter	FIFO test failed.
762-900 through 762-999	D	SPS adapter I/O planar data cable	DMA engine test failed.
762-Ax3 (See note)	D	SPS adapter (terminator)	Card wrap test failed.
762-Ax4 (See note)	D	SPS data cable (wrap plug)	Cable wrap test failed.
763-1xx (See note)	D	SPS MX adapter software system or I/O planar	Problem detected with a device or device data corrupted. **Note:** You may need to reinstall **ssp.css** software.
763-200 through 763-299 (except 763-282)	D	ext clock SPS MX adapter wrap plug	Problem detected with the external clock (SP switch).
763-282	D	switch cable	Adapter is good but switch cable is not attached.
763-2A0 through 763-2A9	D	SPS MX adapter	Problem detected with the internal clock.
763-3xx (See note)	D	SPS MX adapter system or I/O planar	Problem detected with POS registers.

Table 1-13 (Page 3 of 6). Service Request Number (SRN) Table for Switch Adapters

Service Request Number	SRN Source	Failing Component(s)	Description
763-4xx (See note)	D	SPS MX adapter software	TBIC test failed.
763-5xx (See note)	D	SPS MX adapter	SRAM test failed.
763-6xx (See note)	D	SPS MX adapter	Microprocessor test failed.
763-7xx (See note)	D	SPS MX adapter	Interrupt test failed.
763-8xx (See note)	D	SPS MX adapter	FIFO test failed.
763-9xx (See note)	D	SPS MX adapter switch cable system or I/O planar	DMA engine test failed.
763-Ax3 (See note)	D	SPS MX adapter (terminator)	Card wrap test failed.
763-Ax4 (See note)	D	switch cable (wrap plug)	Cable wrap test failed.
763-xx2 (See note)	D	SPS MX adapter	Bad adapter (except SRN 763-282).
763-xx3	D	SPS MX Adapter	Bad adapter.
763-xx4	D	SPS MX Adapter Switch Cable	Bad switch cable.
764-1xx (See note)	D	SP System Attachment Adapter software system or I/O planar	Problem detected with a device or device data corrupted. **Note:** You may need to reinstall **ssp.css** software.
764-200 through 764-299 (except 764-282)	D	ext clock SP System Attachment Adapter wrap plug	Problem detected with the external clock (SP switch).
764-282	D	switch cable	Adapter is good but switch cable is not attached.
764-2A0 through 764-2A9	D	SP System Attachment Adapter	Problem detected with the internal clock.
764-3xx (See note)	D	SP System Attachment Adapter system or I/O planar	Problem detected with POS registers.
764-4xx (See note)	D	SP System Attachment Adapter software	TBIC test failed.
764-5xx (See note)	D	SP System Attachment Adapter	SRAM test failed.

Table 1-13 (Page 4 of 6). Service Request Number (SRN) Table for Switch Adapters

Service Request Number	SRN Source	Failing Component(s)	Description
764-6xx (See note)	D	SP System Attachment Adapter	Microprocessor test failed.
764-7xx (See note)	D	SP System Attachment Adapter	Interrupt test failed.
764-8xx (See note)	D	SP System Attachment Adapter	FIFO test failed.
764-9xx (See note)	D	SP System Attachment Adapter switch cable system or I/O planar	DMA engine test failed.
764-Ax3 (See note)	D	SP System Attachment Adapter (terminator)	Card wrap test failed.
764-Ax4 (See note)	D	switch cable (wrap plug)	Cable wrap test failed.
764-xx2 (See note)	D	SP System Attachment Adapter	Bad adapter (except SRN 764-282).
764-xx3	D	SP System Attachment Adapter	Bad adapter.
764-xx4	D	SP System Attachment Adapter Switch Cable	Bad switch cable.
80x-762	D	Software SPS Adapter	Error occurred while running the diagnostics.
80x-83C	D	Software HiPS Adapter-2	Error occurred while running the diagnostics.
80x-890	D	Software HiPS Adapter-1	Error occurred while running the diagnostics.
83C-100 through 83C-199	D	HiPS Adapter-2 Software System or I/O planar	Problem detected with device or device data corrupted. You may need to reinstall “ssp.css” code.
83C-200 through 83C-299	D	External clock HiPS Adapter-2 (Wrap Plug)	Problem detected with external clock.
83C-300 through 83C-399	D	HiPS Adapter-2 System or I/O Planar	Problem detected with POS registers.
83C-400 through 83C-419	D	HiPS Adapter-2	MSMU read/write test failed.
83C-420 through 83C-429	D	HiPS Adapter-2 Software	MSMU test failed.
83C-430 through 83C-499	D	HiPS Adapter-2 Software	MSMU returned garbage data.

Table 1-13 (Page 5 of 6). Service Request Number (SRN) Table for Switch Adapters

Service Request Number	SRN Source	Failing Component(s)	Description
83C-500 through 83C-599	D	HiPS Adapter-2	DRAM test failed.
83C-600 through 83C-699	D	HiPS Adapter-2	Microprocessor test failed.
83C-700 through 83C-799	D	HiPS Adapter-2	Interrupt test failed.
83C-800 through 83C-899	D	HiPS Adapter-2	FIFO test failed.
83C-900 through 83C-999	D	HiPS Adapter-2 I/O planar	DMA engine test failed.
83C-Ax3 (See note)	D	HiPS Adapter-2 (Terminator)	Card wrap test failed.
83C-Ax4 (See note)	D	Data cable (Wrap plug)	Cable wrap test failed.
980-101	D	HiPS Adapter-1 Software System or I/O planar	Device driver open error.
980-102	D	HiPS Adapter-1 Software System or I/O planar	Device configuration error.
980-201 through 980-203	D	HiPS Adapter-1 System or I/O planar	POS read/write test failed.
980-210	D	HiPS Adapter-1 External clock	Card wrap network initialization failure.
980-211 through 980-213	D	HiPS Adapter-1 (Terminator)	Card wrap test failed.
980-214 980-215	D	HiPS Adapter-1 Data cable (Wrap plug)	Cable wrap test failed w/o running card wrap test.
980-216 980-217	D	Data cable (Wrap plug)	Cable wrap test failed only (card wrap test passed).
980-220 980-221	D	HiPS Adapter-1	Adapter hardware read/write test failed.
980-222	D	HiPS Adapter-1 External clock	Adapter hardware data read error.
980-223	D	HiPS Adapter-1	Adapter FIFO read/write test failed.
980-224	D	External clock HiPS Adapter-1	Adapter hardware read/write test failed on external clock.

Table 1-13 (Page 6 of 6). Service Request Number (SRN) Table for Switch Adapters

Service Request Number	SRN Source	Failing Component(s)	Description
980-225	D	HiPS Adapter-1	Adapter hardware read/write test failed on internal clock.
980-226	D	External clock HiPS Adapter-1 (Wrap plug)	Cable wrap network initialization failure.

Note:

An 'x' in an SRN indicates a "don't care" digit.

– Go to Step 024.

024

An SRN was obtained and Table 1-13 on page 1-332 was used to determine the list of possible failing components.

– From the list of possible failing components, use the following prioritized table to perform service.

Priority	Failing Component	Action
1	Software	1. Have customer verify that the software is configured and operating correctly for this processor node/system. 2. If no problem is found, continue with next highest priority item in the list for this SRN. 3. Otherwise, power off this processor node and continue service at Step 034 on page 1-339.
2	External clock	1. Check to see if a switch clock cable is connected at switch adapter of this processor node. 2. If clock cable exists, reseat switch clock cable; otherwise reseat switch data cable. 3. Run advanced diagnostics on the device "css0". 4. If diagnostics fail with the previous SRN, check at least one other processor node for indication of a clock problem. If necessary, run advanced diagnostics on this other node, using the device "css0". 5. If more than one node has a clock problem, go to Step 025 on page 1-338. 6. Replace the switch clock cable or switch data cable that was just reseated in step 2 above. 7. Continue service at Step 035 on page 1-339.
3	Data cable	1. Reseat switch data cable at switch adapter of this processor node. 2. Run advanced diagnostics on the device "css0". 3. If diagnostics fail with the previous SRN, replace switch data cable. 4. Continue service at Step 035 on page 1-339.

Priority	Failing Component	Action
4	HiPS Adapter-1 HiPS Adapter-2 SPS Adapter SP System Attachment Adapter	1. Replace the switch adapter card on this processor node. 2. Reconnect all cables to the processor node. 3. Continue service at Step 035 on page 1-339. **Note:** Before disconnecting cables or performing service actions on an SP-attached server, perform "Decoupling and Coupling Code for SP-Attached Servers" in *RS/6000 SP: Maintenance Information, Volume 3*.
6	System or I/O planar	1. Run advanced diagnostics on the “Base System” or I/O planar. If a problem is detected, use SRN to service. 2. Replace the system or I/O planar on this processor node. Make sure to reinstall all parts and cables. 3. Reconnect all cables to the processor node. 4. Continue service at Step 035 on page 1-339.
7	Wrap plug or Terminator	Check the wrap plug or terminator again to make sure that it is not at fault.
8	All components replaced.	Call next level of support.

025

Test indicates a clock problem.

– Check the switch clock selections on the “problem” switch(es). Reference "Selecting Appropriate Switch Clocks" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for more information.

Do the clock settings on the “problem” switch assemblies appear to be okay?

Yes **No**

026

– Change the clock selections on the appropriate switch(es). Reference "Selecting Appropriate Switch Clocks" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for more information.
– Go to Step 101 on page 1-350 to verify fix.

027

Is an external clock selected?

Yes **No**

028

Defective master clock card.

Is this the only switch in this system?

Yes **No**

029

– Have the customer select an alternate clock (via the **Eclock** command.
– Issue the **Estart** command.
(Step **029** continues)

029 (continued)
Does the switch run?
Yes **No**

030

– Continue service at Step 035.

031

– Go to Step 032.

032

– For HiPS 3.0, replace the switch clock card. Refer to "Removing the Switch Clock Card (HiPS 3.0)" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– For HiPS 3.0, HiPS 2.0, SPS, or SPS-8, replace the switch assembly. Refer to "Procedures for Switch Assemblies" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– Go to Step 101 on page 1-350 to verify fix.

033

– Go to Step 029 on page 1-338.

034

– From the node front panel on the control workstation, put the mode in the SERVICE position.
– Power-on this processor node.
– Go to Step 035.

035

– Run advanced diagnostics in service mode on the device “css0”.
Do you get an SRN from diagnostics?
Yes **No**

036

No problem detected by diagnostics.
Have you just reseated, repaired, or replaced a component?
Yes **No**

037

Problem must be switch assembly.
– Go to Step 093 on page 1-349 to service or replace switch assembly.

038

– Go to Step 101 on page 1-350 to verify fix.

039

(Step **039** continues)

039 (continued)
Problem detected by diagnostics.
Is this SRN the same as the previous SRN?
Yes **No**

040

– Go to Step 023 on page 1-332 to service the new SRN.

041

– Go to Step 024 on page 1-337 to perform service on the next highest priority component in the list for this SRN.

042

The **/var/adm/SPlogs/css/out.top** file indicated a problem with a switch-to-switch connection or wrapped port.
– Check the specified jack(s) at rear of switch assemblies for an obvious problem such as a loose connection. Pay special attention to cables that may have been moved recently.
Do connection(s) appear to be okay?
Yes **No**

043

– Fix the obvious connection problem.
– Go to Step 101 on page 1-350 to verify the fix.

044

– If this is a **multi-frame system**, check the indicated jacks against the wiring charts for multi-frame switch systems.

Note: Be aware that in large systems, connections for switch assemblies not in the multi-switch frame are usually scattered throughout the **out.top** file.

Is this a multi-frame system with problems reported on all switch data cables from one or more switches?
Yes **No**

045

– Depending on whether the problem is a **wrapped port** or a **switch-to-switch** connection, perform one of the following steps:

- **wrapped port** (wrap plug installed): Remove the existing wrap plug. Install a different wrap plug on the jack(s) indicated.
- **switch-to-switch** connection: Disconnect the switch data cable from both ports indicated. Install wrap plugs on the jacks indicated.

Note: When unplugging the two ends of the suspect cable, check **/var/adm/SPlogs/css/out.top** to verify only two (2) ports were lost. If four (4) ports were lost, then two cables were swapped across that switch to switch connection. Connect the cables correctly and check **/var/adm/SPlogs/css/out.top** for any other errors.

(Step **045** continues)

045 (continued)

– If this is a **switch-to-switch** connection, have customer update the switch configuration file appropriately (to show wrap plugs) before continuing:

  - For code levels 1.00 - 1.01, modify the **/etc/SP/expected.top** on the primary node.
  - For code level 1.02 and higher, use the **Etopology** command.

– Make sure processor node(s) that were put in “Service” mode are returned to “Normal” mode. Make sure all processor node(s) are IPLed completely.
– Have customer verify that the switch code is running on all processor nodes.
– From the control workstation of the “primary” processor node, type **Estart** followed by **ENTER**.
– Check **/var/adm/SPlogs/css/out.top** file for problems regarding the jack(s) indicated.

Does out.top file show a problem on any jack(s) indicated?

Yes **No**

046

– If this is a **switch-to-switch** connection, remove both wrap plugs from the switch assemblies. Replace the frame-to-frame switch data cable that was disconnected before.
– Go to Step 101 on page 1-350 to verify the fix.

047

Problem is in the switch assembly which is still reporting a problem.
– Go to Step 093 on page 1-349 to service or replace the switch assembly.

048

Possible problem caused by clocking or grounding between frames.
– Continue with Step 049

049

Problem reported with all switch data cables from one or more frames. This may be caused by a clocking or grounding problem between frames.

Note: The **“master-clock” switch** indicates the switch which is supplying the master clock for the system—the master clock will have the clock input multiplexor set to “internal clock” (0). A **“problem” switch** indicates any switch which is experiencing problems.

– Check the switch clock selections on the “problem” switch(es). Reference "Selecting Appropriate Switch Clocks" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for more information.

Do the clock settings on the “problem” switch assemblies appear to be okay?

Yes **No**

050

– Change the clock selections on the appropriate switch(es). Reference "Selecting Appropriate Switch Clocks" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for more information.
– Go to Step 101 on page 1-350 to verify fix.

051

(Step **051** continues)

051 (continued)
Is the problem switch in a frame with processor nodes?
Yes **No**

052

Problem switch is in a multi-switch frame.
– From the system monitor on the control workstation, open the “Switch Front Panel” window for this switch.
– Check the clock selection to see if it is set to “Internal” or to one of the following:

- **HiPS:** “External 1”, “External 2”, or “External 3”
- **SPS:** “Jack3”, “Jack4”, or “Jack5”.

Is the clock selection set to one of the External clocks?
Yes **No**

053

This switch is providing the master clock for the system.
– Have customer use the **Eclock** command to select a different master clock for the system.
– Go to Step 101 on page 1-350 to verify fix.

054

– Select a different external clock for this switch assembly.
– From the control workstation of the primary node, enter:

Estart

to reinitialize the switch.
– Check **/var/adm/SPlogs/css/out.top** file to see if problems are still reported on all data cables connected to this switch assembly.
Have some of the problems reported on data cables connected to this switch assembly been resolved?
Yes **No**

055

Probable problem with switch clock card or switch planar in this switch assembly.
– Replace the clock card in this switch assembly. Make sure to reconnect all cables connected to the clock card.
– Reconnect cables S00-BH-J1, S00-BH-J2, S00-BH-J3, S00-BH-J5, and S00-BH-J7 at tailgate of this switch assembly.
– Set the switch clock selection on this switch assembly to the original (correct) setting.
– From the control workstation of the primary node, enter:

Estart

to reinitialize the switch.
– Check **/var/adm/SPlogs/css/out.top** file to see if problems are still reported on all data cables connected to this switch assembly.
(Step **055** continues)

055 (continued)

Are there still problems reported on all data cables connected to this switch assembly?

Yes **No**

056

Clock problem resolved for this switch assembly.

– Go to Step 100 on page 1-350

057

Problem with switch planar.

– Go to Step 094 on page 1-349 to replace switch assembly.

058

– Go to Step 060.

059

– Go to Step 065 on page 1-344.

060

Probable problem with original external clock source.

– Based on the original external clock selection, locate the frame which was sourcing the switch clock. Locate a “test” processor node in this frame which can be used for service.
– Disconnect the switch data cable for this processor node at the tailgate of the switch assembly.
– Using switch cabling list, locate the switch data cable (S00-BH-J3, S00-BH-J5, S00-BH-J7, or S00-BH-J9) at the processor node frame that sources the clock to the failing switch assembly. Disconnect this cable at the tailgate of the processor node frame, then connect the end of the processor node data cable to the jack.
– Run advanced diagnostics on “css0” on the “test” processor node. Do not perform cable wrap test. Reference "Running Diagnostics in a Processor Node" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, as required.
– Look for an SRN indicating a clock problem (such as “External clock”) is one of the failing components.

Do the “css0” diagnostics fail with an indication of a clock problem?

Yes **No**

061

Problem is either cable or reported switch assembly.

– Replace switch data cable that originally supplied the switch clock to the failing switch assembly.
– Set the switch clock selection on this switch assembly to the original (correct) setting.
– From the control workstation of the primary node, enter:

Estart

to reinitialize the switch.

– Check the **/var/adm/SPlogs/css/out.top** file to see if problems are still reported on all data cables connected to this switch assembly.

(Step **061** continues)

061 (continued)

Are there still problems reported on all data cables connected to this switch assembly?

Yes **No**

062

Clock problem resolved for this switch assembly.

– Go to Step 100 on page 1-350

063

Clock problem isolated to reported switch assembly.

– Go to Step 055 on page 1-342

064

Problem with switch clock source switch assembly.

– Replace clock card in the clock source switch assembly. Make sure to reconnect all cables connected to the clock card.
– Set the switch clock selection on this switch assembly to the original (correct) setting.
– Go to Step 055 on page 1-342 to service the clock source switch assembly.

065

– Check the ground strap(s) connected to the “problem” frame(s). Ground strap(s) are connected at bolts near the cable escapes inside the bottom rear of each frame. Refer to “RS/6000 SP Installation Instructions”, in *IBM RS/6000 SP: Maintenance Information Volume 1, Installation and Relocation*, for a view of a ground strap connection.

Do all ground strap(s) connecting the frames make adequate contact at both ends?

Yes **No**

066

– Fix or replace ground strap between the frames.
– Go to Step 101 on page 1-350 to verify fix.

067

– Determine whether this is an HiPS 2.0 or HiPS 3.0 switch assembly. An HiPS 3.0 switch assembly has no connectors at HPS-BH-J35 and HPS-BH-J36.

Is this an HiPS 3.0 switch assembly?

Yes **No**

068

This is an HiPS 2.0 switch assembly; therefore, we need to check data cable interposer connections. External clock sources 1, 2, and 3 correspond to top (S00-BH-J361), middle (S00-BH-362), and bottom (S00-BH-J363) connections at S00-BH-J36, respectively.

– Either visually or by referencing Appendix A in *IBM RS/6000 SP: Maintenance Information Volume 1*, determine which bulkhead jack, S00-BH-J3, S00-BH-J5, S00-BH-J7, or S00-BH-J9, corresponds to the data cable interposer of the selected clock.
– Go to Step 070 on page 1-345.

069

(Step **069** continues)

069 (continued)
This is an HiPS 3.0 assembly.
– The switch clock selected for this frame is from one of the following sources (with corresponding switch data cables):

```
Internal   :   No cable
External 1 :   S00-BH-J3
External 2 :   S00-BH-J5
External 3 :   S00-BH-J7
```

– Go to Step 070

070

– Disconnect clock source data cable at S00-BH-J3, J5, J7, or J9, then reconnect to switch assembly. (This is done to eliminate clocking noise from cable.)
– Find a processor node in the “problem” frame which is usable for service. This will be used as the “test” processor node.
– Run advanced diagnostics on “css0” on the “test” processor node. Do not perform cable wrap test. Reference "Running Diagnostics in a Processor Node" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, as required.
– Look for an SRN indicating a clock problem, i.e. “External clock” is one of the failing components.

Note: Do not exit from diagnostics at this time, as it may be used in the following steps.

Do the “css0” diagnostics fail with indication of a clock problem?
Yes **No**

071

Diagnostics did not fail with indication of a clock problem.
Is this the first time at this step?
Yes **No**

072

– Go to Step 101 on page 1-350 to verify the fix.

073

– Disconnect the switch data cable corresponding to the selected clock at the switch assembly.
– Run advanced diagnostics on “css0” on the “test” processor node. Do not perform cable wrap test. Reference "Running Diagnostics in a Processor Node" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, as required.
– Look for an SRN indicating a clock problem, i.e., “External clock” is one of the failing components.

Note: Do not exit from diagnostics at this time, as it will be used in the following steps.

Do the “css0” diagnostics fail with indication of a clock problem?
Yes **No**

074

Problem is the clock selection in this switch assembly.
– Replace the clock card in this switch assembly. Make sure to connect all cables connected to the clock card.
– Reinstall only the two switch data cables which are not selected and the switch data cable to the “test” processor node. Do not connect the remaining switch data cables at this time.
(Step **074** continues)

074 (continued)
– Reconnect cables S00-BH-P1 and S00-BH-P2 at the rear of the switch assembly.
– Put the circuit breaker at the front of the switch assembly in the On (‘1’) position.
– Set the switch clock selections on the “problem” switch(es). Reference "Selecting Appropriate Switch Clocks" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for more information.
– Run advanced diagnostics on “css0” on the “test” processor node. Do not perform cable wrap test. Reference "Running Diagnostics in a Processor Node" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, as required.
– Look for an SRN indicating a clock problem, i.e., “External clock” is one of the failing components.

Note: Do not exit from diagnostics at this time, as it may be used in the following steps.

Do the “css0” diagnostics fail with indication of a clock problem?
Yes **No**

075

– Go to Step 093 on page 1-349 to replace the “problem” switch assembly.

076

Clock problem resolved.
– Go to Step 101 on page 1-350 to verify fix.

077

Problem is not in the switch assembly.
– Replace the switch data cable corresponding to the selected clock, reconnecting it at both switch assemblies.
– Go to Step 090 on page 1-348.

078

– Go to Step 079.

079

– Record current clock setting for the switch (internal/external).
– From the control workstation, select the internal clock for this switch assembly.
– Run advanced diagnostics on “css0” on the “test” processor node. Do not perform cable wrap test. Reference "Running Diagnostics in a Processor Node" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, as required.
– Look for an SRN indicating a clock problem, i.e., “External clock” is one of the failing components.

Do the “css0” diagnostics fail with indication of a clock problem?
Yes **No**

080

– Determine whether this is an HiPS 2.0 or HiPS 3.0 switch assembly. An HiPS 3.0 switch assembly has no connectors at HPS-BH-J35 and HPS-BH-J36.

(Step **080** continues)

080 (continued)

Is this an HiPS 3.0 switch assembly?

Yes **No**

081

This is an HiPS 2.0 switch assembly; therefore, we need to check data cable interposer connections. External clock sources 1, 2, and 3 correspond to top (S00-BH-J361), middle (S00-BH-362), and bottom (S00-BH-J363) connections at S00-BH-J36, respectively.

– Either visually or by referencing Appendix A in *RS/6000 SP: Maintenance Information Volume 1*, determine which bulkhead jack, S00-BH-J3, S00-BH-J5, S00-BH-J7, or S00-BH-J9, corresponds to the data cable interposer of the original clock selection recorded in Step 079 on page 1-346.
– Go to Step 083.

082

This is an HiPS 3.0 assembly.

– The switch clock selected for this frame is from one of the following sources (with corresponding switch data cables):

```
Internal   :   No cable
External 1 :   S00-BH-J3
External 2 :   S00-BH-J5
External 3 :   S00-BH-J7
```

– Go to Step 083.

083

– Check data cable interposer (if present) and switch data cable corresponding to the original external clock selection at this switch assembly for any obvious problem such as a loose cable connection or swapped cable(s).
– Referencing Appendix A in *RS/6000 SP: Maintenance Information Volume 1*, determine other end of switch data cable, then check switch data cable and data cable interposer (if present) at this other switch assembly for any obvious problem such as a loose cable connection or swapped cable(s).

Do the switch data cables and any data cable interposers appear to be okay?

Yes **No**

084

– Fix the obvious cable connection problem.
– Go to Step 101 on page 1-350 to verify fix.

085

Try swapping the cable carrying the current clock with another cable carrying a clock to isolate the problem.

– If this is an HiPS 2.0 switch assembly, swap the data cable interposer connection at S00-BH-J361, J362, or J363 with another data cable interposer at S00-BH-J361, J362, or J363 below.
– If this is an HiPS 3.0 switch assembly, swap the data cable with another one connected at S00-BH-J3, S00-BH-J5, or S00-BH-J7 below.
– If this is an SPS switch assembly, swap the data cable with another one at S00-BH-J3, S00-BH-J4, or S00-BH-J5 below.
– Swap the switch data cable (HiPS 3.0 or SPS) or data cable interposer (HiPS 2.0) at the switch assembly with another one. This should provide a good clock.

(Step **085** continues)

085 (continued)
– Reset the clock setting to that recorded in Step 079 on page 1-346.
– Run advanced diagnostics on “css0” on the “test” processor node. Do not perform cable wrap test. Reference "Running Diagnostics in a Processor Node" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, as required.
– Look for an SRN indicating a clock problem, for example “External clock” is one of the failing components.

Do the “css0” diagnostics fail with indication of a clock problem?

Yes **No**

086

Problem is not in this switch assembly.
– If this is an HiPS 3.0 or SPS switch assembly, skip to Step 088.
– If this is an HiPS 2.0 switch assembly, swap the corresponding data connections at S00-BH-J3, J5, J7, or J9.
– Run advanced diagnostics on “css0” on the “test” processor node. Do not perform cable wrap test. Reference "Running Diagnostics in a Processor Node" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, as required.
– Look for an SRN indicating a clock problem, for example “External clock” is one of the failing components.

Do the “css0” diagnostics fail with indication of a clock problem?

Yes **No**

087

– Return all cables and interposers to original positions.
– Replace the data cable interposer corresponding to the selected clock.
– Go to Step 090.

088

– Return all cables and interposers to original positions.
– Go to Step 077 on page 1-346.

089

Problem is the clock selection in this switch assembly.
– Go to Step 074 on page 1-345.

090

– Run advanced diagnostics on “css0” on the “test” processor node. Do not perform cable wrap test. Reference "Running Diagnostics in a Processor Node" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*, as required.
– Look for an SRN indicating a clock problem, for example “External clock” is one of the failing components.

Do the “css0” diagnostics fail with indication of a clock problem?

Yes **No**

091

Interframe clock problem resolved.
– Go to Step 101 on page 1-350 to verify fix.

092

– Go to Step 093 to replace the “master-clock” switch assembly.

093

Problem with switch assembly.
– Put the circuit breaker at the front of the switch assembly in the Off (‘0’) position.
– Disconnect all switch data cables (also clock cables and data cable interposers, if present) from the bulkhead of the switch assembly.

Is this an HiPS-LC8 switch assembly?

Yes **No**

094

– Replace the switch assembly. Refer to "Procedures for Switch Assemblies" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures*.
– If this is an HiPS 2.0 switch assembly, reconnect data cables.
– Go to Step 100 on page 1-350

095

This is an 8-port switch.

Is problem related to an individual switch port (processor node)?

Yes **No**

096

– Replace the switch planar.
– Reinstall all cables inside the switch assembly, then reinstall the top cover.
– Reinstall the switch assembly.
– Go to Step 100 on page 1-350

097

Problem may be tailgate cable inside switch assembly.
– Remove switch assembly from the frame, then remove cover.
– Locate tailgate cable corresponding to the failing port.
– Disconnect tailgate cable at switch planar, then install a wrap plug on this end of the tailgate cable.
– Reinstall the switch assembly in frame (do not install cover), then connect a switch data cable from an available processor node.
– Run advanced diagnostics on “css0” from this processor node, performing cable wrap test with cable from adapter card through the tailgate cable to the wrap plug.

Do diagnostics fail cable wrap test?

Yes **No**

098

– Go to Step 096 to replace switch planar.

099

– Replace the tailgate cable
– Reinstall top cover of switch assembly.

(Step **099** continues)

099 (continued)
– Go to Step 100

100

– Be careful to reconnect all cables according to the appropriate wiring chart or labels, and put wrap plugs on any unused data ports (S00-BH-J3 through S00-BH-J34).
– Put the circuit breaker at the front of the switch assembly in the On (‘1’) position.
– Go to Step 101 to verify replacement.

101

– Make sure any processor node(s) that was put in **SERVICE** mode is returned to **NORMAL** mode. Make sure all processor node(s) are IPLed completely in **NORMAL** mode.
– If any processor nodes that lost switch clocks before or during service (due to unplugging node data/clock cable, loss of clock at switch assembly connected to processor nodes, or so on), you will need to include them in the following command. From the control workstation, enter:

  dsh -w *nodelist* **/usr/lpp/ssp/css/css_restart_node**

  OR, if all processor nodes have lost switch clocks, enter:

  dsh -a /usr/lpp/ssp/css/css_restart_node

  where *nodelist* is a list of node names separated by commas.

  Example:

  ```
  dsh -w fr2n03,fr2n04,fr3n01 /usr/lpp/ssp/css/css_restart_node
  ```

  Attention: Issuing this command on processor nodes that did *not* lose a clock may cause unpredictable results, possibly requiring re-IPL.

– Have customer verify that the switch code is running on all processor nodes **OR** from the control workstation, enter:

  ```
  Estart
  ```

– Check **/var/adm/SPlogs/css/out.top** file.
– Go to Step 001 on page 1-322 to verify that there are no other switch problems.

MAP 0550: Dependent Node

A dependent node is a general term which refers to a switch adapter installed externally to the 9076 SP, but connected to the SP switch. In the current implementation, a dependent node refers to each RS/6000 SP Switch Router Adapter installed in the RS/6000 SP Switch Router (machine type 9077). There may be several SP Switch Router Adapters (dependent nodes) in each SP Switch Router, but each occurrence is called a dependent node.

This MAP resolves problems specific to switch communication between the SP Switch Router Adapter and the SP switch. For any other problem with the SP Switch Router, refer to the "SP Switch Router Adapter Guide" or other documentation supplied with the SP Switch Router.

Note: If there are multiple SP Switch Router Adapters in the system, you can find out configuration information and identify them by using the following commands:

SDRGetObjects DependentNode (returns more information)

SDRGetObjects DependentAdapter (returns IP address and netmask)

By referring to the dependent node_number, you can identify the location of the SP Switch Router Adapter as follows:

"reliable_hostname" indicates hostname of the SP Switch Router

"extension_node_identifier" indicates two-digit slot number of the SP Switch Router Adapter in the SP Switch Router.

001

Problem detected with switch communication to a dependent node.
- Check for an obvious problem with the switch cable between the switch assembly and the SP Switch Router Adapter card, such as a loose or broken cable.
- Fix any obvious problem.

Was there an obvious problem?

Yes **No**

002

No obvious problems exist.
- Make sure the system administrator has performed problem determination procedures in the *RS/6000 SP: Diagnosis and Messages Guide* and/or checked the configuration of the SP Switch Router Adapter.

Was the customer able to fix a configuration problem?

Yes **No**

003

Continue service with the SP Switch Router (or SP Switch Router Adapter).
- If you are responsible for the SP Switch Router, check connectivity to the SP using *SP Switch Router Adapter Guide*.

Was there a problem found and corrected with the SP Switch Router or SP Switch Router Adapter?

Yes **No**

004

- Go to Step 010 on page 1-352

005

Problem was resolved.
– Go to Step 007 to verify the fix.

006

Problem was resolved.
– Go to Step 007 to verify the fix.

007

Problem may have been resolved by a fix.
– Issue **Eunfence** command for the dependent node.
– Issue **SDRGetObjects switch_responds** to see if the value of "switch_responds" is "0" for this dependent node.

Does "switch_responds" show a value of "0" for this dependent node?

Yes **No**

008

Problem was resolved.
– If there are other switch problems, return to “MAP 0540: Switch Function” on page 1-322; otherwise, go to “MAP 0570: End of Call” on page 1-357.

009

Problem was not resolved.
– Go to Step 002 on page 1-351.

010

– Replace the SP switch cable between this SP Switch Router Adapter and the SP switch.
– Issue an **Eunfence** command for this dependent node to attempt to bring this adapter on-line.
– Issue **SDRGetObjects switch_responds** to see if the value of "switch_responds" is "0" for this dependent node.

Does "switch_responds" show a value of "0" for this dependent node?

Yes **No**

011

Problem was resolved.
– If there are other switch problems, return to “MAP 0540: Switch Function” on page 1-322; otherwise, go to “MAP 0570: End of Call” on page 1-357.

012

No problem was found with the SP Switch Router or SP Switch Router Adapter.
– Call next level of support. If the switch assembly must be replaced, go to Step 093 on page 1-349 to replace the SP switch assembly.

MAP 0560: Block Multiplexer Channel Adapter (BMCA)

Notes:

1. The cables and wrap plugs that are shipped with the BMCA feature are different than the standard RS/6000 cables and wrap plugs.
2. Ensure that customer jobs have been canceled on the BMCA feature and the associated I/O addresses are varied off-line before servicing.
3. If multiple nodes are failing on the same channel, that parallel channel on the mainframe should be varied off-line.
4. The maximum allowable adapters on a chain is eight.
5. Refer to *Diagnostic Information for Micro Channel Bus Systems* (SA38-0532), Map 0020 (Problem Determination Procedure), Step 3, for additional information on performing diagnostics.

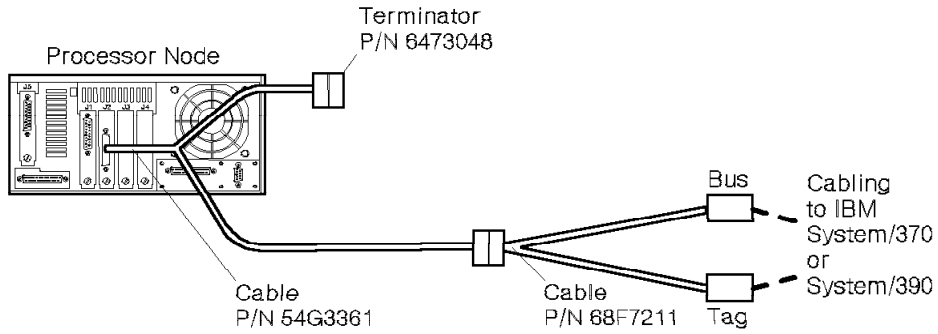


Figure 1-37. BMCA Cabling to Single Processor Node

001

Problem detected with the BMCA feature.

Are multiple processor nodes failing on this channel?

Yes **No**

002

Only one processor node failing.

– Put the cable connector's Select-out Bypass Switch of the suspect BMCA card in the Bypass (“B”) position.
– Remove cable from the suspect BMCA card connector.
– Install the BMCA card wrap plug P/N 71F1184 on the card connector.
– Run advanced diagnostics on this BMCA (“cat0”) through the card wrap test.

Did the card and card wrap diagnostics complete successfully?

Yes **No**

003

– Replace the BMCA card.
– Install the BMCA card wrap plug P/N 71F1184 on the new card connector.
– Run advanced diagnostics on this BMCA (“cat0”) through the card wrap test.

(Step **003** continues)

003 (continued)
Did the card and card wrap diagnostics complete successfully?
Yes **No**

004

– Call next level of support.

005

Problem resolved. Restore node to channel.
– Remove the card wrap plug P/N 71F1184 from the adapter connector.
– Install cable on the new BMCA card connector.
– Restore the Select-out Bypass Switch to the Select (“S”) position.
– Inform the Customer that the channel resource is available.
– Go to “MAP 0570: End of Call” on page 1-357.

006

Potential cable problem exists. Restore node to channel.
– Remove the card wrap plug P/N 71F1184 from the adapter connector.
– Install cable back on the BMCA card connector.
– Restore the Select-out Bypass Switch to the Select (“S”) position.
– Continue at Step 007.

007

Potential cable problem exists. Channel interface must be opened.
– Ensure that customer has no application on the failing channel, and the parallel channel on the mainframe is varied off-line.
– Trace and note the cabling connections of the BMCA cabling from the cable entering the frame (P/N 54G3361) to each succeeding node in the daisy chain until the terminator is reached. Make special note of which processor node is the “first” on the chain; it should be the one with cable P/N 54G3361 (Y-cable with one nine-foot leg) attached.
– Verify that the cable at each adaptor has the Select-out Bypass Switch (labeled S/B) in the Select (“S”) position.
– Check for obvious problems in the cabling chain, such as loose cable connections or missing terminator.

Were all the BMCA interface cables and terminators properly connected?
Yes **No**

008

– Fix the obvious problem.
Does this correct the customer reported problem?
Yes **No**

009

– Go to Step 011 on page 1-355 to test cabling.

010

Problem resolved.
– Inform the Customer that the channel resource is available.
(Step **010** continues)

010 (continued)
– Go to “MAP 0570: End of Call” on page 1-357.

011

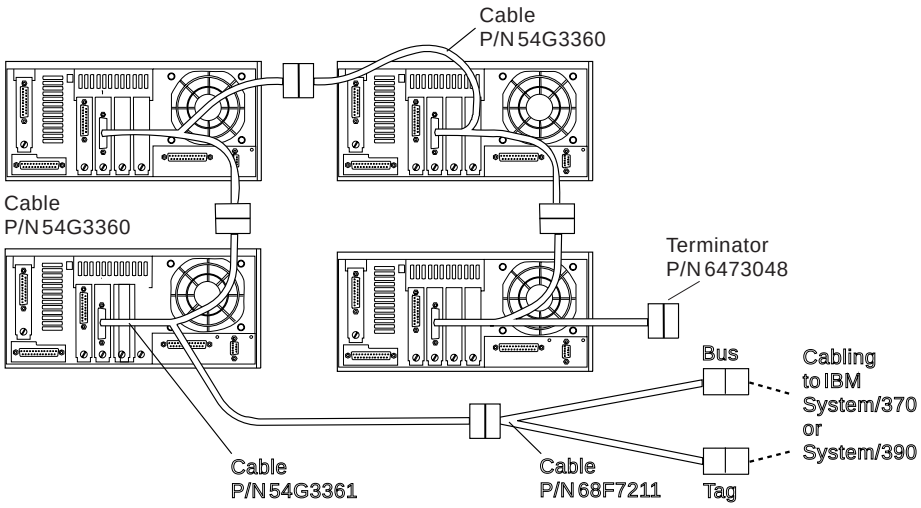


Figure 1-38. BMCA Cabling to Multiple Processor Nodes

No obvious cabling problem found. Prepare to test interface cables.
– Remove the channel-attach (mainframe) cables from the end of cable P/N 68F7211, which is farthest from the frame.
– Install wrap plugs, P/N 8575337 (Bus) and P/N 8575338 (Tag) on that end of the cable P/N 68F7211.
– Go to Step 012.

012

– Test all RS/6000 SP BMCA cables and terminator on this channel interface.
– Run advanced diagnostics on the suspect BMCA (“cat0”), including the cable wrap test.

Did the diagnostics fail?

Yes **No**

013

Have diagnostics been run from all failing nodes?

Yes **No**

014

– Select next failing BMCA node as the suspect node.
– Go to Step 012 to continue testing cables.

015

All RS/6000 SP adapters and cables test okay.
– If all processor nodes but one fail on this channel, suspect the good BMCA. It may be causing the others to show errors.
– Problem might exist with channel IOCDS or application defined BMCA addressing.
– Make sure all BMCA nodes on this channel are using different address ranges
(Step **015** continues)

015 (continued)
- Problem may exist with channel interface cables to host or attaching unit.
- Remove wrap plugs, P/N 8575337 (Bus) and P/N 8575338 (Tag) from end of the cable P/N 68F7211.
- Reconnect the channel-attach (mainframe) cables to the end of cable P/N 68F7211, which is farthest from the frame.
- Continue analysis from mainframe channel or call next level of support.

016

Problem was detected with the BMCA 78-pin cables or terminator connecting the BMCA cards.
- Isolate failing cable by moving terminator, swapping or deleting cables from string.
- Do not forget defective terminator or wrap plugs can cause failure.
- Refer to Figure 1-38 on page 1-355, while isolating fault.

Failing component isolated successfully?

Yes **No**

017

- Call next level of support.

018

- Replace defective component.
- Restore cables, wrap plugs, and terminator to original configuration.
- Rerun advanced diagnostics on the suspect BMCA (“cat0”) to verify repair.

Did the card and cable wrap diagnostics complete successfully?

Yes **No**

019

- Go to Step 016 to retest cables.

020

Problem resolved.
- Remove wrap plugs, P/N 8575337 (Bus) and P/N 8575338 (Tag) from end of the cable P/N 68F7211.
- Reconnect the channel-attach (mainframe) cables to the end of cable P/N 68F7211, which is farthest from the frame.
- Inform the Customer that the channel resource is available.
- Go to “MAP 0570: End of Call” on page 1-357.

MAP 0570: End of Call

This MAP is referenced upon completion of a service action. This MAP indicates the information to be logged, actions required by the customer to utilize fix, and actions required to verify that the hardware is left in a usable state.

001

– Check the following table for any further steps required to complete service actions.

Service Action	Steps to Complete Recovery
• Processor node fixed disk replaced • Processor node I/O planar replaced • Processor node Micro Channel adapter replaced • Node supervisor power was removed during service.	Have customer perform the appropriate steps in *IBM RS/6000 SP: Administration Guide* under “Recovery Procedures.”

– Continue at Step 002

002

Service action was taken.

Was a Field Replaceable Unit (FRU) replaced, or any service action taken (such as a cable/card reseated), and the fix verified?

Yes **No**

003

No FRU was replaced and verified.

Was service action an EC or regular upgrade?

Yes **No**

004

– Record action taken in account log.
– Open a Tracking Problem Management Record (PMR) through support center (RETAIN).
– Record time service action as appropriate service code **Incomplete** against Machine Type/Serial Number.
– Go to Step 009 on page 1-358 and refer to Table 1-14 on page 1-358 for proper serial number to record the service call against.

005

– Record action in account log against all appropriate nodes or the EC number.
– Go to Step 009 on page 1-358 and refer to Table 1-14 on page 1-358 for proper serial number to record the EC against.

006

– Verify the replaced FRU is functioning properly by performing "System Verification Tests" from the diagnostics menu.
– Record action completed in the account log.
– Properly account for parts utilized in this service call.

(Step **006** continues)

006 (continued)
– Record time as complete on Machine Type/Serial Number. Refer to Table 1-14 for proper serial number to record the service action against.
– Record hardware addresses for any Ethernet card(s) or I/O planar card(s) replaced for updating customer's **bootptab.info** and/or other file(s).
– Check conditions in table of Step 002 on page 1-5.

Are any of the conditions in table of Step 002 on page 1-5 present?

Yes **No**

007

Service call is complete.
– Unfence any node(s) that were fenced for service action. See "Viewing Switch Partitions" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for more information.
– Check "Preventive Maintenance" in *IBM RS/6000 SP: Maintenance Information, Volume 3, Locations and Service Procedures* for preventive maintenance procedures.

008

Further service action is required.
– Go to Step 002 on page 1-5.

009

–

Table 1-14. Proper Serial Number to Record

Fault Isolated To	Serial Number to Record
RS/6000 SP • Base Frame: – Power distribution – Frame supervisor – Supervisor harness – Frame cabling • Switch Feature: – Multi-Switch Frame (F/C 2030/1) – Switch assembly – Switch adaptors – Switch cables • Processor node components	Controlling frame serial number (see note)
Other: • Control workstation • File server (not included in RS/6000 SP frame network)	Do NOT record time against RS/6000 SP when trouble is isolated to another Machine Type.
Note: Controlling frame serial number is the RS/6000 SP Model 20X, 30X, or 40X frame of a multiple frame configuration.	

MAP 1520: Main Power

001

– If you came to this book looking for a 1520 Main Power MAP, go to one of the following MAPs:

Single node problem “MAP 0130: Processor Node” on page 1-30

Multiple node problem “MAP 0370: Main Power” on page 1-222

MAP 1540: Minimum Configuration

001

–

If you came to this book looking for a 1540 Minimum Configuration MAP, go to one of the following MAPs:

Thin/wide nodes “MAP 0130: Processor Node” on page 1-30

High nodes “MAP 0280: 604 or 604e High Node Minimum Configuration” on page 1-145

332 MHz SMP node “MAP 0320: 332 MHz SMP Node Minimum Configuration” on page 1-186

POWER3 SMP node “MAP 0360: POWER3 SMP Thin and Wide Node Minimum Configuration” on page 1-217

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Maintenance Analysis Procedures

Publication No. GA22-7376-01

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