

# Isolation Procedures



REFERENCE  
86 A1 97FA 01



# ESCALA

## Isolation Procedures

### Hardware

May 2009

BULL CEDOC  
357 AVENUE PATTON  
B.P.20845  
49008 ANGERS CEDEX 01  
FRANCE

REFERENCE  
86 A1 97FA 01

The following copyright notice protects this book under Copyright laws which prohibit such actions as, but not limited to, copying, distributing, modifying, and making derivative works.

Copyright © Bull SAS 2009

Printed in France

## **Trademarks and Acknowledgements**

We acknowledge the rights of the proprietors of the trademarks mentioned in this manual.

All brand names and software and hardware product names are subject to trademark and/or patent protection.

Quoting of brand and product names is for information purposes only and does not represent trademark misuse.

*The information in this document is subject to change without notice. Bull will not be liable for errors contained herein, or for incidental or consequential damages in connection with the use of this material.*

---

# Contents

<b>Safety notices</b> . . . . .	<b>ix</b>
<b>Isolation procedures</b> . . . . .	<b>1</b>
HSL/RIO 12X isolation procedures . . . . .	1
Bus, high-speed link (HSL/RIO/12X) isolation information . . . . .	1
PCI bus isolation using AIX, Linux, or the HMC . . . . .	2
Isolating a PCI bus problem while running AIX or Linux . . . . .	2
Isolating a PCI bus problem from the HMC . . . . .	3
Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair . . . . .	3
Analyzing a RIO/HSL/12X or PCI bus reference code . . . . .	5
DSA translation . . . . .	6
Card positions . . . . .	7
Converting the loop number to RIO/HSL/12X port location labels . . . . .	15
Fiber-optic cleaning procedures . . . . .	20
Status indications for RIO/HSL . . . . .	20
RIO/HSL/12X connection problems . . . . .	27
Additional RIO/HSL FRUs . . . . .	29
Powering on and powering off an I/O expansion unit . . . . .	29
HSL loop configuration and status form . . . . .	29
Installed features in a PCI bridge set form . . . . .	30
RIO/HSL/12X link status diagnosis form . . . . .	30
CONSL01 . . . . .	31
RIOIP01 . . . . .	32
Main task . . . . .	32
The ports on both ends of the failed link are in different system units on the loop. . . . .	33
The port on one end of the failed link is in a system unit and the port on the other end is in an I/O unit. . . . .	34
The ports on both ends of the failed link are in an I/O unit . . . . .	35
Cannot power on unit . . . . .	36
Manually detecting the failed link . . . . .	36
Refresh the port status. . . . .	37
RIOIP06 . . . . .	37
RIOIP08 . . . . .	38
RIOIP09 . . . . .	39
RIOIP10 . . . . .	40
RIOIP11 . . . . .	41
RIOIP12 . . . . .	42
RIOIP56 . . . . .	43
Multi-adapter bridge isolation procedures . . . . .	44
MABIP02 . . . . .	44
MABIP03 . . . . .	44
MABIP05 . . . . .	44
MABIP50 . . . . .	45
MABIP51 . . . . .	46
MABIP52 . . . . .	47
MABIP53 . . . . .	48
MABIP54 . . . . .	51
MABIP55 . . . . .	53
Communication isolation procedure . . . . .	56
COMIP01, COMPIP1 . . . . .	56
Disk unit isolation procedure . . . . .	58
DSKIP03 . . . . .	58
Intermittent isolation procedures . . . . .	61
INTIP03 . . . . .	62
INTIP05 . . . . .	63
INTIP07 . . . . .	63

INTIP08	. . . . .	64
INTIP09	. . . . .	65
INTIP14	. . . . .	67
INTIP16	. . . . .	67
INTIP18	. . . . .	67
INTIP20	. . . . .	67
INTIP24	. . . . .	68
I/O processor isolation procedures		69
IOPIP01	. . . . .	70
Using the product activity log	. . . . .	73
IOPIP13	. . . . .	73
IOPIP16	. . . . .	75
IOPIP17	. . . . .	78
IOPIP18	. . . . .	80
IOPIP19	. . . . .	82
IOPIP20	. . . . .	82
IOPIP21	. . . . .	84
IOPIP22	. . . . .	85
IOPIP23	. . . . .	85
IOPIP25	. . . . .	85
IOPIP26	. . . . .	87
IOPIP27	. . . . .	88
IOPIP28	. . . . .	90
IOPIP29	. . . . .	90
IOPIP30	. . . . .	91
IOPIP31	. . . . .	94
IOPIP32	. . . . .	95
IOPIP33	. . . . .	96
IOPIP34	. . . . .	97
IOPIP40	. . . . .	97
IOPIP41	. . . . .	98
Licensed internal code isolation procedures.		99
LICIP01	. . . . .	100
LICIP03	. . . . .	101
LICIP04	. . . . .	102
LICIP07	. . . . .	103
LICIP08	. . . . .	105
LICIP11	. . . . .	106
How to find the cause code	. . . . .	106
0001	. . . . .	106
0002	. . . . .	107
0004	. . . . .	110
0005	. . . . .	110
0006	. . . . .	110
0007	. . . . .	110
0008	. . . . .	110
0009	. . . . .	111
000A	. . . . .	111
000B	. . . . .	111
000C	. . . . .	111
000D	. . . . .	112
000E	. . . . .	112
0010	. . . . .	112
0011	. . . . .	112
0012	. . . . .	112
0015	. . . . .	112
0016	. . . . .	112
0017	. . . . .	113
0018	. . . . .	113
0019	. . . . .	113
001A	. . . . .	113

001C	114
001D	114
001E	114
001F	114
0020	114
0021	114
0022	115
0023	115
0024	115
0025	115
0026	115
0027	116
0031	116
0033	116
0034	116
0035	116
0037	116
0099	117
LICIP12	117
How to find the cause code	117
0002	117
0004	119
0007	119
0008	119
0009	119
000A	120
000B	120
000D	120
000E	120
002C	120
002D	120
002E	120
002F	121
0030	121
0032	121
0099	121
LICIP13	121
LICIP14	126
LICIP15	126
LICIP16	128
Logical partition isolation procedure.	130
LPRIP01	130
Operations console isolation procedures	134
OPCIP03	135
Power isolation procedures.	137
Power problems	137
Cannot power on system unit	138
Cannot power off system or SPCN-controlled I/O expansion unit	141
Cannot power on SPCN-controlled I/O expansion unit	145
PWR1900	151
PWR1904	151
Instructions for Model MMA	151
PWR1905	154
Instructions for Models 8203-E4A, 8204-E8A, 9407-M15, 9408-M25, or 9409-M50	154
PWR1906	156
PWR1906 Instructions for 5094 and 5294 expansion units.	156
PWR1907	158
PWR1908	160
PWR1908 instructions for 5088 or 0588 expansion units	160
PWR1909	162
Instructions for 5095, 0595, 5790, 5796, 5802 and 5877, 7311-D11, 7311-D20 and 7314-G30	162

PWR1911 . . . . .	164
PWR1912 . . . . .	170
PWR1917 . . . . .	171
PWR1918 . . . . .	173
PWR1920 . . . . .	176
PWR2402 . . . . .	176
Router isolation procedures . . . . .	178
RTRIP01 . . . . .	178
RTRIP02 . . . . .	178
RTRIP03 . . . . .	179
RTRIP04 . . . . .	179
PIOCARD . . . . .	179
SIIOADP . . . . .	180
RTRIP05 . . . . .	182
RTRIP06 . . . . .	183
RTRIP07 . . . . .	185
RTRIP08 . . . . .	185
Serial-attached SCSI isolation procedures . . . . .	186
SIP3110 . . . . .	186
SIP3111 . . . . .	188
SIP3112 . . . . .	189
SIP3113 . . . . .	191
SIP3120 . . . . .	193
SIP3121 . . . . .	194
SIP3130 . . . . .	194
SIP3131 . . . . .	196
SIP3132 . . . . .	198
SIP3134 . . . . .	200
SIP3140 . . . . .	202
SIP3141 . . . . .	202
SIP3142 . . . . .	204
SIP3143 . . . . .	205
SIP3144 . . . . .	207
SIP3145 . . . . .	210
SIP3146 . . . . .	211
SIP3147 . . . . .	213
SIP3148 . . . . .	214
SIP3149 . . . . .	215
SIP3150 . . . . .	215
SIP3152 . . . . .	218
SIP3153 . . . . .	220
Service processor isolation procedures . . . . .	221
FSPSP01 . . . . .	221
FSPSP02 . . . . .	226
FSPSP03 . . . . .	227
FSPSP04 . . . . .	227
FSPSP05 . . . . .	227
FSPSP06 . . . . .	227
FSPSP07 . . . . .	227
FSPSP09 . . . . .	227
FSPSP10 . . . . .	228
FSPSP11 . . . . .	229
FSPSP12 . . . . .	229
FSPSP14 . . . . .	229
FSPSP16 . . . . .	230
FSPSP17 . . . . .	230
FSPSP18 . . . . .	230
FSPSP20 . . . . .	230
FSPSP22 . . . . .	230
FSPSP23 . . . . .	231
FSPSP24 . . . . .	231

FSPSP25 . . . . .	232
FSPSP27 . . . . .	232
FSPSP28 . . . . .	235
FSPSP29 . . . . .	235
FSPSP30 . . . . .	236
FSPSP31 . . . . .	237
FSPSP32 . . . . .	237
FSPSP33 . . . . .	239
FSPSP34 . . . . .	240
FSPSP35 . . . . .	240
FSPSP36 . . . . .	240
FSPSP38 . . . . .	241
FSPSP42 . . . . .	243
FSPSP45 . . . . .	244
FSPSP46 . . . . .	246
FSPSP47 . . . . .	246
FSPSP48 . . . . .	247
FSPSP49 . . . . .	248
FSPSP50 . . . . .	249
FSPSP51 . . . . .	249
FSPSP52 . . . . .	249
FSPSP54 . . . . .	250
FSPSP55 . . . . .	250
FSPSP57 . . . . .	253
9119-FHA bulk power connection tables . . . . .	255
9125-F2A bulk power connection tables . . . . .	256
FSPSP58 . . . . .	258
FSPSP59 . . . . .	258
FSPSP60 . . . . .	258
FSPSP61 . . . . .	258
9119-FHA bulk power connection tables . . . . .	258
9125-F2A bulk power connection tables . . . . .	260
FSPSP62 . . . . .	261
9119-FHA bulk power connection tables . . . . .	262
9125-F2A bulk power connection tables . . . . .	263
FSPSP63 . . . . .	265
FSPSP64 . . . . .	265
FSPSP66 . . . . .	265
FSPSPC1 . . . . .	265
FSPSPD1 . . . . .	269
Tape unit isolation procedures . . . . .	269
TUPIP02 . . . . .	270
TUPIP03 . . . . .	272
TUPIP04 . . . . .	274
TUPIP06 . . . . .	278
Tape unit self-test procedure . . . . .	279
Running the self-test . . . . .	279
Interpreting the results . . . . .	280
Tape device ready conditions . . . . .	280
Twinaxial workstation I/O processor isolation procedure . . . . .	281
TWSIP01 . . . . .	282
Workstation adapter isolation procedure . . . . .	288
WSAIP01 . . . . .	289
Workstation adapter console isolation procedure . . . . .	291
Isolating problems on servers that run AIX or Linux . . . . .	293
MAP 0210: General problem resolution . . . . .	293
Problems with loading and starting the operating system (AIX and Linux) . . . . .	294
Storage I/O card modes and jumpers . . . . .	297
Setting or changing the mode of an I/O card . . . . .	298
How to set or change the mode of an I/O card . . . . .	298
Mode jumper has been overridden . . . . .	299

Mode jumper is missing . . . . .	299
SCSI service hints . . . . .	299
General SCSI Configuration Checks . . . . .	299
High Availability or Multiple SCSI System Checks . . . . .	299
SCSI-2 Single-Ended Adapter PTC Failure Isolation Procedure . . . . .	300
Determining Where to Start . . . . .	300
External SCSI-2 Single-Ended Bus PTC Isolation Procedure . . . . .	300
External SCSI-2 Single-Ended Bus Probable Tripped PTC Causes . . . . .	301
Internal SCSI-2 Single-Ended Bus PTC Isolation Procedure . . . . .	302
Internal SCSI-2 Single-Ended Bus Probable Tripped PTC Resistor Causes . . . . .	303
SCSI-2 Differential Adapter PTC Failure Isolation Procedure. . . . .	303
External SCSI-2 Differential Adapter Bus PTC Isolation Procedure. . . . .	304
SCSI-2 Differential Adapter Probable Tripped PTC Causes . . . . .	305
Dual-Channel Ultra SCSI Adapter PTC Failure Isolation Procedure . . . . .	305
64-bit PCI-X Dual Channel SCSI Adapter PTC Failure Isolation Procedure . . . . .	306
MAP 0220: Hot-Swap FRU problem resolution . . . . .	306
MAP 0020: Problem determination procedure. . . . .	311
MAP 0030: Additional problem determination . . . . .	317
MAP 0040: Intermittent problem isolation . . . . .	318
MAP 0050: SCSI bus problems. . . . .	320
Preparing for hot-plug SCSI device or cable deconfiguration. . . . .	325
Purpose of this procedure . . . . .	326
After hot-plug SCSI device or cable deconfiguration . . . . .	326
MAP 0054: PCI-X SCSI bus problems . . . . .	327
MAP 0070: 888 sequence in operator panel display . . . . .	329
MAP 0230: Platform error problem resolution . . . . .	330
MAP 0235: System Array Self-Repair Problem Resolution. . . . .	335
MAP 0260: System hangs during resource configuration . . . . .	336
MAP 0270: SCSI RAID problem resolution and verification . . . . .	338
MAP 0280: Console and keyboard problem resolution . . . . .	342
MAP 0285: Multipath I/O problem resolution . . . . .	343
MAP 0291: Missing device or bus problem resolution . . . . .	347
PFW1540: Problem isolation procedures . . . . .	348
PFW1542: I/O problem isolation procedure . . . . .	349
PFW1548: Memory and processor subsystem problem isolation procedure . . . . .	364
PFW1548: Memory and processor subsystem problem isolation procedure when an HMC is attached . . . . .	378
PFW1548: Memory and processor subsystem problem isolation procedure without an HMC attached . . . . .	385
<b>Appendix. Notices . . . . .</b>	<b>395</b>
Trademarks . . . . .	396
Electronic emission notices . . . . .	396
Class A Notices. . . . .	396
Terms and conditions. . . . .	399

---

## Safety notices

Safety notices may be printed throughout this guide:

- **DANGER** notices call attention to a situation that is potentially lethal or extremely hazardous to people.
- **CAUTION** notices call attention to a situation that is potentially hazardous to people because of some existing condition.
- **Attention** notices call attention to the possibility of damage to a program, device, system, or data.

### World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, a safety information booklet is included in the publications package shipped with the product. The booklet contains the safety information in your national language with references to the U.S. English source. Before using a U.S. English publication to install, operate, or service this product, you must first become familiar with the related safety information in the booklet. You should also refer to the booklet any time you do not clearly understand any safety information in the U.S. English publications.

### German safety information

Das Produkt ist nicht für den Einsatz an Bildschirmarbeitsplätzen im Sinne § 2 der Bildschirmarbeitsverordnung geeignet.

### Laser safety information

IBM® servers can use I/O cards or features that are fiber-optic based and that utilize lasers or LEDs.

#### Laser compliance

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

#### CAUTION:

**This product might contain one or more of the following devices: CD-ROM drive, DVD-ROM drive, DVD-RAM drive, or laser module, which are Class 1 laser products. Note the following information:**

- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of the controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

(C026)

#### CAUTION:

**Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. (C027)**

#### CAUTION:

**This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)**

**CAUTION:**

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information: laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)

**Power and cabling information for NEBS (Network Equipment-Building System) GR-1089-CORE**

The following comments apply to the IBM servers that have been designated as conforming to NEBS (Network Equipment-Building System) GR-1089-CORE:

The equipment is suitable for installation in the following:

- Network telecommunications facilities
- Locations where the NEC (National Electrical Code) applies

The intrabuilding ports of this equipment are suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding ports of this equipment *must not* be metallically connected to the interfaces that connect to the OSP (outside plant) or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.

**Note:** All Ethernet cables must be shielded and grounded at both ends.

The ac-powered system does not require the use of an external surge protection device (SPD).

The dc-powered system employs an isolated DC return (DC-I) design. The DC battery return terminal *shall not* be connected to the chassis or frame ground.

---

## Isolation procedures

Isolation procedures are used together with diagnostic programs that are part of server firmware.

If a server is connected to an HMC, these procedures are available on the HMC. Use the HMC procedures to continue isolating the problem. If the server does not have an HMC and you are directed to perform an isolation procedure, the procedures documented here are needed to continue isolating a problem.

---

### HSL/RIO 12X isolation procedures

Use RIO/HSL/12X isolation procedures if there is no HMC attached to the server. If the server is connected to an HMC, use the procedures that are available on the HMC to continue FRU isolation.

Use RIO/HSL/12X isolation procedures if there is no HMC attached to the server. If the server is connected to an HMC, use the procedures that are available on the HMC to continue FRU isolation.

---

### Bus, high-speed link (HSL/RIO/12X) isolation information

Symbolic FRUs, failing items, and bus isolation procedures use the terms partition and logical partition to indicate any single partition in a system that has multiple partitions. If the system you are working on does not have multiple partitions, then the terms refer to the primary partition.

Read all safety notices below before servicing the system and while performing a procedure.

**Note:** Unless instructed otherwise, always power off the system before removing, exchanging, or installing a field-replaceable unit (FRU).

## DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

## PCI bus isolation using AIX, Linux, or the HMC

Isolate a PCI bus problem from the HMC or while running in the AIX® or Linux® environment.

If you have an HMC, then this procedure should be performed from the HMC as part of the HMC directed service.

If you do not have an HMC, then you should perform this procedure when directed by the maintenance package.

### Isolating a PCI bus problem while running AIX or Linux

Can an IPL be run on the operating system?

- **No:** Perform "MABIP52" on page 47. **This ends the procedure.**
- **Yes:** Choose from the following:
  - If you are running AIX, go to Running the AIX online and standalone diagnostics log to isolate the PCI bus failure with online diagnostics in concurrent mode.

- If you are running Linux, go to Running the AIX online and standalone diagnostics log to isolate the PCI bus failure with stand-alone diagnostics.

**This ends the procedure.**

## Isolating a PCI bus problem from the HMC

To isolate a PCI bus problem from the HMC, check the serviceable event view for the server for FRU part locations associated with the serviceable event, then continue with this procedure:

1. Did the serviceable event view provide the locations for the failing FRUs?
  - Yes:** Use those locations to exchange the given FRUs one at a time until the problem is resolved.  
**This ends the procedure.**
  - No:** Continue with the next step.
2. Go to "DSA translation" on page 6 to determine the Direct Select Address (DSA).
3. Perform the following:
  - a. Record the bus number value (BBBB) from the DSA and convert it to decimal format.
  - b. Search for the decimal system bus number in the partition resources screens on the HMC.
  - c. Record the frame or unit type and continue with the next step.
4. Record the Cc value from the DSA. Is the Cc value greater than 00?
  - Yes:** Continue with the next step.
  - No:** The multi-adapter bridge number and the multi-adapter function number have not been identified, and so the card slot cannot be identified using the DSA. Look in the HMC partition resources for non-reporting or non-operational hardware. That will indicate which cards in which positions need to be replaced. Refer to System FRU locations for the model you are working on for information about the multi-adapter bridge that controls those card slots. That multi-adapter bridge is also a FRU. **This ends the procedure.**
5. Is the right-most character (c) F?
  - No:** Continue with the next step.
  - Yes:** Only the multi-adapter bridge number has been identified. Record the multi-adapter bridge number (left-most character of Cc) for later use. Because the card slot cannot be identified with the DSA, refer to System FRU locations for the model you are working on for information about the multi-adapter bridge that controls the card slots. Consider all card slots controlled by the multi-adapter bridge to be FRUs. **This ends the procedure.**
6. Refer to "Card positions" on page 7 and use the BBBB and Cc values that you recorded to identify the card position. Then return to the procedure that sent you here. **This ends the procedure.**

## Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair

Use this procedure to verify a repair for the high-speed link, a system PCI bus, or for a multi-adapter bridge.

Within this procedure, the terms "system" and "logical partition" are interchangeable when used individually.

1. Perform this procedure from the logical partition you were in when you were sent to this procedure, or from the HMC if this error was worked from the HMC.
2. If you previously powered off a system or logical partition, or an expansion unit during this service action, then you need to power it off again.
3. Install all cards, cables, and hardware, ensuring that all connections are tight. You can use the system configuration list to verify that the cards are installed correctly.
4. Power on any expansion unit, logical partition or system unit that was powered off during the service action. Is one of the following true?

- If the system or a logical partition was powered off during the service action, does the IPL complete successfully to the IPL or does Install the System display?
- If an expansion tower was powered off during the service action, does the expansion tower power on complete successfully?
- If any IOP or IOA card locations were powered off using concurrent maintenance during the service action, do the slots power on successfully?
- If you exchanged a FRU that should appear as a resource or resources to the system, such as an IOA, or I/O bridge, does the new FRU's resource appear in HSM as operational?

**Yes:** Continue with the next step.

**No:** Verify that you have followed the power off, remove and replace, and power-on procedures correctly. When you are sure that you have followed the procedures correctly, then exchange the next FRU in the list. If there are no more FRUs to exchange, then contact your next level of support. **This ends the procedure.**

5. Does the system or logical partition have mirrored protection? Select Yes if you are not sure.

**No:** Continue with the next step.

**Yes:** From the Dedicated Service Tools (DST) display, select **Work with disk units**, and resume mirrored protection for all units that have a suspended status.

6. Choose from the following options:

- If you are working from a partition, from the Start a Service Tool display, select **Hardware service manager** and look for the I/O processors that have a failed or missing status.
- If you are working from a HMC, look at the CEC properties.

a. Choose the I/O tab.

b. Look for IOAs or IOPs that have a failed or missing status.

Are all I/O processor cards operational?

**Note:** Ignore any IOPs that are listed with a status of not connected.

**Yes:** Go to step 10 on page 5.

**No:** Display the logical hardware resource information for the non-operational I/O processors. For all I/O processors and I/O adapters that are failing; record the bus number (BBBB), board (bb) and card information (Cc). Continue with the next step.

7. Perform the following:

a. Return to the Dedicated Service Tools (DST) display.

b. Display the Product Activity Log.

c. Select **All logs** and search for an entry with the same bus, board, and card address information as the non-operational I/O processor. Do not include informational or statistical entries in your search. Use only entries that occurred during the last IPL.

Did you find an entry for the SRC that sent you to this procedure?

**No:** Continue with the next step.

**Yes:** Ask your next level of support for assistance. **This ends the procedure.**

8. Did you find a B600 6944 SRC that occurred during the last IPL?

**Yes:** Continue with the next step.

**No:** A different SRC is associated with the non-operational I/O processor. Go to the Start of Call procedure and look up the new SRC to correct the problem. **This ends the procedure.**

9. Is there a B600 xxxx SRC that occurred during the last IPL other than the B600 6944 and informational SRCs?

**Yes:** Use the other B600 xxxx SRC to determine the problem. Go to the Start of Call and look up the new SRC to correct the problem. **This ends the procedure.**

**No:** You connected an I/O processor in the wrong card position. Use the system configuration list to compare the cards. When you have corrected the configuration, go to the start of this procedure to verify the bus repair. **This ends the procedure.**

10. If in a partition, use the hardware service manager function to print the system configuration list.

Are there any configuration mismatches?

**No:** Continue with the next step.

**Yes:** Ask your next level of support for assistance. **This ends the procedure.**

11. You have verified the repair of the system bus.
- a. If for this service action only an expansion unit was powered off or only the concurrent maintenance function was used for an IOP or IOA, then continue with the next step.
  - b. Otherwise, perform the following to return the system to the customer:
    - 1) Power off the system or logical partition. See Powering on and powering off the system for procedures on powering on or off your system.
    - 2) Select the operating mode with which the customer was originally running.
    - 3) Power on the system or logical partition.
12. If the system has logical partitions and the entry point SRC was B600 xxxx, then check for related problems in other logical partitions that could have been caused by the failing part. **This ends the procedure.**

## Analyzing a RIO/HSL/12X or PCI bus reference code

Use Word 7 of the reference code to determine the bus number, bus type, multi-adapter bridge number, multi-adapter bridge function number, and logical card number from the direct select address (DSA).

Physical card slot labels and card positions for PCI buses are determined by using the DSA and the appropriate system unit or I/O unit card positions. See “Card positions” on page 7 for details.

*Table 1. RIO/HSL/12X and PCI reference code analysis*

Word of the reference code	Control panel function	Panel function characters	Format	Description
1	11	1–8	B600 uuuu or B700 uuuu	uuuu = unit reference code (69xx)
1 – extended reference code information	11	9–16	iiii	Frame ID of the failing resource
1 – extended reference code information	11	17–24	ffff	Frame location
1 – extended reference code information	11	25–32	bbbb	Board position
2	12	1–8	MIGVEP62 or MIGVEP63	See System Reference Code (SRC) Format Description.
3	12	9–16	cccc cccc	Component reference code
4	12	17–24	pppp pppp	Programming reference code
5	12	25–32	qqqq qqqq	Program reference code high order qualifier
6	13	1–8	qqqq qqqq	Program reference code low order qualifier

Table 1. RIO/HSL/12X and PCI reference code analysis (continued)

Word of the reference code	Control panel function	Panel function characters	Format	Description
7	13	9–16	BBBB Ccbb	See “DSA translation”
8	13	17–24	TTTT MMMM	Type (TTTT) and model (MMMM) of the failing item (if not zero)
9	13	25–32	uuuu uuuu	Unit address (if not zero)

## DSA translation

The Direct Select Address (DSA) may be coded in word 7 of the reference code.

This DSA is either a PCI system bus number or a RIO/HSL/12X loop number, depending on the type of error. With the following information, and the information in either the card position table (for PCI bus numbers) or the information in the loop-number-to-NIC-port table (for RIO/HSL/12X loop numbers), you can isolate a failing PCI bus or RIO/HSL/12X loop. Use the following instructions to translate the DSA:

- Separate the DSA into the bus number, multi-adapter bridge number, and multi-adapter bridge function number. The DSA is of the form BBBB Ccxx, and separates into the following parts:
  - BBBB = bus number
  - C = multi-adapter bridge number
  - c = multi-adapter bridge function number
  - xx = not used
- Is the bus number less than 0684?

**Yes:** The bus number is a PCI bus number in hexadecimal. Convert the number to decimal, and then continue with the next step.

**No:** The bus number is a RIO/HSL/12X loop number in hexadecimal. Convert the number to decimal, and then go to step 4.
- Use one of the following guides to determine the type of system unit or expansion unit in which the bus is located:
  - If you are using a Hardware Management Console (HMC) interface, view the managed system’s properties on the HMC.
  - If you are using AIX or Linux, use the command line interface to determine the enclosure type. On the command line, type the following:

```
lshwres -r io --rsubtype bus
```

The result will be in the form:

```
unit_phys_loc=Uxxxx.yyy.zzzzzz,bus_id=a,  
.....
```

Find the bus ID “a” entry that matches the decimal bus number you determined in step 2. Using the corresponding Uxxxx value, look up the unit model or enclosure type using the Unit Type and Locations table in System FRU locations.
- Perform one of the following:
  - If you are working with a PCI bus number, refer to “Card positions” on page 7 to search for the bus number, the multi-adapter bridge number, and the multi-adapter bridge function number that matches the system unit or I/O tower type where the bus is located. **This ends the procedure.**
  - If you are working with a RIO/HSL/12X loop number, refer to “Converting the loop number to RIO/HSL/12X port location labels” on page 15 to determine the starting ports for the RIO/HSL/12X loop with the failed link. **This ends the procedure.**

## Card positions

The following information specifies card positions for the various server models.

Use the table for the model you are working on:

- Card positions for models 8203-E4A, 9407-M15, and 9408-M25
- Card positions for model 8204-E8A, and 9409-M50
- Card positions for models 9117 and 9406 MMA L4
- Card positions for models 9117 and 9406 MMA ML8 (L4+)
- Card positions for models 9117 and 9406 MMA ML12 (ML8+)
- Card positions for models 9117 and 9406 MMA ML16 (ML12+)
- Card positions for 5088, 0588, 5094, 5096, 5294, 5296, and 8094-002 expansion units
- Card positions for 5095, 0595, and 7311-D20 expansion units
- Card positions for 7040-61D expansion unit
- Card positions for 7311-D10, 7311-D11, and 5790 expansion units
- Card positions for 7314-G30 expansion unit
- Card positions for models 9125-F2A

*Table 2. Card positions for models 8203-E4A, 9407-M15, and 9408-M25*

Bus number in DSA (hexadecimal/decimal)	Item designated by the DSA	Position label and PCI data width
200/512	Embedded SAS controller	-P1
201/513	Embedded USB controller	-P1
202/514	PCI-X IOA card	-P1-C4
203/515	PCI-X IOA card	-P1-C5
204/516	PCI-E IOA card	-P1-C1
205/517	PCI-E IOA card	-P1-C2
206/518	Auxiliary cache adapter	-P1-C9
207/519	PCI-E IOA card	-P1-C3

*Table 3. Card positions for model 8204-E8A, and 9409-M50*

Bus number in DSA (hexadecimal/decimal)	Item designated by the DSA	Position label and PCI data width
200/512	Embedded SAS controller	-P1
201/513	Embedded USB controller	-P1
202/514	PCI-X IOA card	-P1-C4
203/515	PCI-X IOA card	-P1-C5
204/516	PCI-E IOA card	-P1-C1
205/517	PCI-E IOA card	-P1-C2
206/518	PCI-E IOA card	-P1-C10
207/519	PCI-E IOA card	-P1-C3

Table 4. Card positions for models 9117 and 9406 L4

Bus number in DSA (hexadecimal/decimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
200/512	2	0	Embedded SAS controller	-P1
	2	1		
	2	4	Embedded USB controller	-P1
	2	F	Multi-adapter bridge	-P1
201/513	N/A	N/A	PCI-X IOA card	-P1-C4
202/514	N/A	N/A	PCI-X IOA card	-P1-C5
204/516	N/A	N/A	PCI-E IOA card	-P1-C1
205/517	N/A	N/A	PCI-E IOA card	-P1-C2
206/518	N/A	N/A	PCI-E IOA card	-P1-C3
207/519	N/A	N/A	PCI-E IOA card	-P1-C6

Table 5. Card positions for models 9117 and 9406 ML8 (L4+)

Bus number in DSA (hexadecimal/decimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
220/544	2	0	Embedded SAS controller	-P1
	2	1		
	2	4	Embedded USB controller	-P1
	2	F	Multi-adapter bridge	-P1
221/545	N/A	N/A	PCI-X IOA card	-P1-C4
222/546	N/A	N/A	PCI-X IOA card	-P1-C5
224/548	N/A	N/A	PCI-E IOA card	-P1-C1
225/549	N/A	N/A	PCI-E IOA card	-P1-C2
226/550	N/A	N/A	PCI-E IOA card	-P1-C3
227/551	N/A	N/A	PCI-E IOA card	-P1-C6

Table 6. Card positions for models 9117 and 9406 ML12 (ML8+)

Bus number in DSA (hexadecimal/decimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
240/576	2	0	Embedded SAS controller	-P1
	2	1		
	2	4	Embedded USB controller	-P1
	2	F	Multi-adapter bridge	-P1
241/577	N/A	N/A	PCI-X IOA card	-P1-C4
242/578	N/A	N/A	PCI-X IOA card	-P1-C5
244/580	N/A	N/A	PCI-E IOA card	-P1-C1
245/581	N/A	N/A	PCI-E IOA card	-P1-C2

Table 6. Card positions for models 9117 and 9406 ML12 (ML8+) (continued)

Bus number in DSA (hexadecimal/decimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
246/582	N/A	N/A	PCI-E IOA card	-P1-C3
246/583	N/A	N/A	PCI-E IOA card	-P1-C6

Table 7. Card positions for models 9117 and 9406 ML16 (ML12+)

Bus number in DSA (hexadecimal/decimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
260/608	2	0	Embedded SAS controller	-P1
	2	1		
	2	4	Embedded USB controller	-P1
	2	F	Multi-adapter bridge	-P1
261/609	N/A	N/A	PCI-X IOA card	-P1-C4
262/610	N/A	N/A	PCI-X IOA card	-P1-C5
264/612	N/A	N/A	PCI-E IOA card	-P1-C1
265/613	N/A	N/A	PCI-E IOA card	-P1-C2
266/614	N/A	N/A	PCI-E IOA card	-P1-C3
267/615	N/A	N/A	PCI-E IOA card	-P1-C6

**Notes:**

1. Service 5294 expansion units as two independent 5094 units.

Table 8. Card positions for 5088, 0588, 5094, 5096, 5294, 5296, and 8094-002 expansion units

Bus number	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to:	Position label and PCI data width
xxxx (assigned by LIC)	2	0 and 1	PCI IOP or IOA card	C01
xxxx (assigned by LIC)	2	2 and 3	PCI IOP or IOA card	C02
xxxx (assigned by LIC)	2	4 and 5	PCI IOP or IOA card	C03
xxxx (assigned by LIC)	2	6 and 7	IOA card	C04
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1
xxxx (assigned by LIC)	2	0 and 1	PCI IOP or IOA card	C05
xxxx (assigned by LIC)	2	2	PCI IOP or IOA card	C06
xxxx (assigned by LIC)	2	3	PCI IOP or IOA card	C07
xxxx (assigned by LIC)	2	4 and 5	PCI IOP or IOA card	C08

Table 8. Card positions for 5088, 0588, 5094, 5096, 5294, 5296, and 8094-002 expansion units (continued)

Bus number	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to:	Position label and PCI data width
xxxx (assigned by LIC)	2	6 and 7	IOA card	C09
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1
xxxx (assigned by LIC)	2	0 and 1	PCI IOP or IOA card	C11
xxxx (assigned by LIC)	2	2	PCI IOP or IOA card	C12
xxxx (assigned by LIC)	2	3	PCI IOP or IOA card	C13
xxxx (assigned by LIC)	2	4 and 5	PCI IOP or IOA card	C14
xxxx (assigned by LIC)	2	6 and 7	IOA card	C15
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1

Table 9. Card positions for 5095, 0595, and 7311-D20 expansion units

Bus number	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to:	Position label and PCI data width
xxxx (assigned by LIC)	2	0 and 1	PCI IOP	C01
xxxx (assigned by LIC)	2	2 and 3	PCI IOP or IOA card	C02
xxxx (assigned by LIC)	2	4 and 5	PCI IOP or IOA card	C03
xxxx (assigned by LIC)	2	6 and 7	IOA card	C04
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1
xxxx (assigned by LIC)	2	Not used	Not used	C05
xxxx (assigned by LIC)	2	0 and 1	PCI IOP	C06
xxxx (assigned by LIC)	2	2 and 3	PCI IOP or IOA card	C07
xxxx (assigned by LIC)	2	6 and 7	IOA card	C08
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1

Table 10. Card positions for 7040-61D expansion unit

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
LEFT SIDE I/O PLANAR (-P1)				
Lower PCI bus number	2	0	PCI IOA card	-P1-I1 (64 bit)
Lower PCI bus number	2	1		

Table 10. Card positions for 7040-61D expansion unit (continued)

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
Lower PCI bus number	2	2	PCI IOA card	-P1-I2 (64 bit)
Lower PCI bus number	2	3		
Lower PCI bus number	2	4	PCI IOA card	-P1-I3 (64 bit)
Lower PCI bus number	2	5		
Lower PCI bus number	2	6	PCI IOA card	-P1-I4 (64 bit)
Lower PCI bus number	2	7		
Lower PCI bus number	2	F	Multi-adapter bridge	-P1
Middle PCI bus number	2	0	PCI IOA card	-P1-I5 (64 bit)
Middle PCI bus number	2	1		
Middle PCI bus number	2	2	PCI IOA card	-P1-I6 (64 bit)
Middle PCI bus number	2	3		
Middle PCI bus number	2	4	Embedded SCSI controller 1	n/a
Middle PCI bus number	2	5		
Middle PCI bus number	2	6	PCI IOA card	-P1-I7 (64 bit)
Middle PCI bus number	2	7		
Middle PCI bus number	2	F	Multi-adapter bridge	-P1
Higher PCI bus number	2	0	PCI IOA card	-P1-I8 (64 bit)
Higher PCI bus number	2	1		
Higher PCI bus number	2	2	PCI IOA card	-P1-I9 (64 bit)
Higher PCI bus number	2	3		
Higher PCI bus number	2	4	Embedded SCSI controller 2	n/a
Higher PCI bus number	2	5		

Table 10. Card positions for 7040-61D expansion unit (continued)

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
Higher PCI bus number	2	6	PCI IOA card	-P1-I10 (64 bit)
Higher PCI bus number	2	7		
Higher PCI bus number	2	F	Multi-adapter bridge	-P1
RIGHT SIDE I/O PLANAR (-P2)				
Lower PCI bus number	2	0	PCI IOA card	-P2-I1 (64 bit)
Lower PCI bus number	2	1		
Lower PCI bus number	2	2	PCI IOA card	-P2-I2 (64 bit)
Lower PCI bus number	2	3		
Lower PCI bus number	2	4	PCI IOA card	-P2-I3 (64 bit)
Lower PCI bus number	2	5		
Lower PCI bus number	2	6	PCI IOA card	-P2-I4 (64 bit)
Lower PCI bus number	2	7		
Lower PCI bus number	2	F	Multi-adapter bridge	-P2
Middle PCI bus number	2	0	PCI IOA card	-P2-I5 (64 bit)
Middle PCI bus number	2	1		
Middle PCI bus number	2	2	PCI IOA card	-P2-I6 (64 bit)
Middle PCI bus number	2	3		
Middle PCI bus number	2	4	Embedded SCSI controller 1	n/a
Middle PCI bus number	2	5		
Middle PCI bus number	2	6	PCI IOA card	-P21-I7 (64 bit)
Middle PCI bus number	2	7		
Middle PCI bus number	2	F	Multi-adapter bridge	-P2

Table 10. Card positions for 7040-61D expansion unit (continued)

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
Higher PCI bus number	2	0	PCI IOA card	-P2-I8 (64 bit)
Higher PCI bus number	2	1		
Higher PCI bus number	2	2	PCI IOA card	-P2-I9 (64 bit)
Higher PCI bus number	2	3		
Higher PCI bus number	2	4	Embedded SCSI controller 2	n/a
Higher PCI bus number	2	5		
Higher PCI bus number	2	6	PCI IOA card	-P2-I10 (64 bit)
Higher PCI bus number	2	7		
Higher PCI bus number	2	F	Multi-adapter bridge	-P2

Table 11. Card positions for 7311-D10, 7311-D11, and 5790 expansion units

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
Lower PCI bus number	2	0	PCI IOA card	-P1-C1 (64 bit)
Lower PCI bus number	2	1		
Lower PCI bus number	2	2	PCI IOA card	-P1-C2 (64 bit)
Lower PCI bus number	2	3		
Lower PCI bus number	2	4	Unused	n/a
Lower PCI bus number	2	5		
Lower PCI bus number	2	6	PCI IOA card	-P1-C3 (64 bit)
Lower PCI bus number	2	7		
Lower PCI bus number	2	F	Multi-adapter bridge	-P1
Higher PCI bus number	2	0	PCI IOA card	-P1-C4 (64 bit)
Higher PCI bus number	2	1		

Table 11. Card positions for 7311-D10, 7311-D11, and 5790 expansion units (continued)

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
Higher PCI bus number	2	2	PCI IOA card	-P1-C5 (64 bit)
Higher PCI bus number	2	3		
Higher PCI bus number	2	4	Unused	n/a
Higher PCI bus number	2	5		
Higher PCI bus number	2	6	PCI IOA card	-P1-C6 (64 bit)
Higher PCI bus number	2	7		
Higher PCI bus number	2	F	Multi-adapter bridge	-P1

Table 12. Card positions for 7314-G30 expansion unit

Bus number	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to:	Position label and PCI data width
xxxx (assigned by LIC)	0	0	PCI-X IOA card	-P1-C1 (64 bit)
xxxx (assigned by LIC)	0	0	PCI-X IOA card	-P1-C2(64 bit)
xxxx (assigned by LIC)	0	0	PCI-X IOA card	-P1-C3(64 bit)
xxxx (assigned by LIC)	0	0	PCI-X IOA card	-P1-C4(64 bit)
xxxx (assigned by LIC)	0	0	PCI-X IOA card	-P1-C5(64 bit)
xxxx (assigned by LIC)	0	0	PCI-X IOA card	-P1-C6(64 bit)

Table 13. Card positions for model 9125-F2A

Bus number in DSA (hexadecimal/decimal)	Item designated by the DSA	Position label and PCI data width
234/564	PCI-E IOA card (top)	-P1-C1-C1
235/565	PCI-E/PCI-X IOA card	-P1-C1-C2
250/592	Embedded SAS controller	-P1-T5
254/596	PCI-E/PCI-X IOA card	-P1-C3-C2
255/597	PCI-E IOA card (top)	-P1-C3-C1

## Converting the loop number to RIO/HSL/12X port location labels

Use this table to convert the RIO/HSL/12X loop number to port location labels.

Select the system you are servicing from the following list:

- 8203-E4A, 9407-M15, and 9408-M25
- 9117-MMA, and 9406-MMA
- 8204-E8A, and 9409-M50
- 9125-F2A
- 9119-FHA0684/1668 0686/1670

### 8203-E4A, 9407-M15, and 9408-M25

Table 14. Converting the loop number to port location labels for an 8203-E4A, 9407-M15, and 9408-M25

Loop number (hex / dec)	Model	FRU position	RIO/HSL/12X port labels on system unit or processor tower
0686 / 1670	8203-E4A, 9407-M15, and 9408-M25 with RIO	-P1-C8	-P1-C8-T1 -P1-C8-T2
0688 / 1672	8203-E4A, 9407-M15, and 9408-M25 with RIO	-P1-C6	-P1-C6-T1 -P1-C6-T2
0781 / 1921	8203-E4A, 9407-M15, and 9408-M25 with 12X	-P1-C8	-P1-C8-T1 -P1-C8-T2
0782 / 1922	8203-E4A, 9407-M15, and 9408-M25 with 12X	-P1-C6	-P1-C6-T1 -P1-C6-T2

### 9117-MMA, and 9406-MMA

**Note:** If you are working on a Model MMA with multiple processor enclosures, exchange the FRU on the correct unit (primary or secondary) by matching the serial number (if available in the FRU list on the serviceable event view) or by matching the loop number to the correct unit.

**Note:** To simplify this information, secondary units on the Model MMA server are numbered 1 through 3-secondary unit 1 being nearest to the primary unit and secondary unit 3 being furthest.

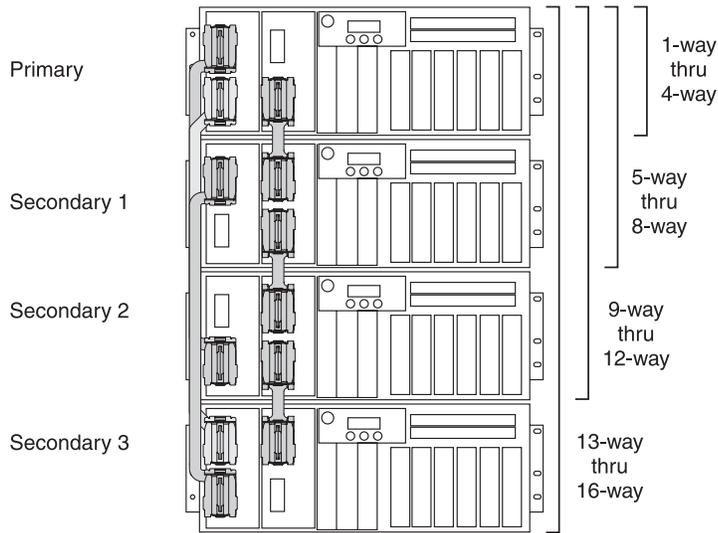


Table 15. Converting the loop number to port location labels for a 9117-MMA, and 9406-MMA

Loop number (hex / dec)	Model	FRU position	RIO/HSL/12X port labels on system unit or processor tower
0686 / 1670	MMA primary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2
0688 / 1672	MMA primary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2
0696 / 1686	MMA first secondary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2
0698 / 1688	MMA first secondary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2
06A6 / 1702	MMA second secondary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2
06A8 / 1704	MMA second secondary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2
06B6 / 1718	MMA third secondary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2
06B8 / 1720	MMA third secondary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2
0781 / 1921	MMA primary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2

Table 15. Converting the loop number to port location labels for a 9117-MMA, and 9406-MMA (continued)

Loop number (hex / dec)	Model	FRU position	RIO/HSL/12X port labels on system unit or processor tower
0782 / 1922	MMA primary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2
0789 / 1929	MMA first secondary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2
078A / 1930	MMA first secondary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2
0791 / 1937	MMA second secondary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2
0792 / 1938	MMA second secondary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2
0799 / 1945	MMA third secondary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2
079A / 1946	MMA third secondary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2

### 8204-E8A, and 9409-M50

Table 16. Converting the loop number to port location labels for an 8204-E8A and 9409-M50

Loop number (hex / dec)	Model	FRU position	RIO/HSL/12X port labels on system unit or processor tower
0686 / 1670	8204-E8A or 9409-M50 with RIO	-P1-C8	-P1-C8-T1 -P1-C8-T2
0688 / 1672	8204-E8A or 9409-M50 with RIO	-P1-C7	-P1-C7-T1 -P1-C7-T2
0781 / 1921	8204-E8A or 9409-M50 with 12X	-P1-C8	-P1-C8-T1 -P1-C8-T2
0782 / 1922	8204-E8A or 9409-M50 with 12X	-P1-C7	-P1-C7-T1 -P1-C7-T2

### 9125-F2A

Table 17. Converting the loop number to port location labels for a 9125-F2A

Loop number (hex / dec)	Model	FRU position	RIO/HSL/12X port labels on system unit or processor tower
069C/1692	9125-F2A with RIO	-P1	Internal
06AC/1708	9125-F2A with RIO	-P1	Internal

Table 17. Converting the loop number to port location labels for a 9125-F2A (continued)

Loop number (hex / dec)	Model	FRU position	RIO/HSL/12X port labels on system unit or processor tower
0782/1922	IH with 12X	-P2-C65	-P2-C65-T1 -P2-C65-T2
0788/1928	9125-F2A with 12X	-P2-C65	-P2-C65-T3 -P2-C65-T4
0790/1936	9125-F2A with 12X	-P2-C66	-P2-C66-T1 -P2-C66-T2
0795/1941	9125-F2A with 12X	-P1	-P1-T1 -P1-T2
079E/1950	9125-F2A with 12X	-P12-C66	-P2-C66-T3 -P2-C66-T4

## 9119-FHA

Table 18. Converting the loop number to port location labels for a 9119-FHA

Loop number (hex / dec)	Model	FRU position	RIO/HSL/12X port labels on system unit or processor tower
<b>Nodes with RIO</b>			
0684/1668	Node P9	-P9-C39	-P9-C39-T1 -P9-C39-T2
0686 / 1670	Node P7	-P7-C39	-P7-C39-T1 -P7-C39-T2
0688/1672	Node P9	-P9-C40	-P9-C40-T1 -P9-C40-T2
068A/1674	Node P7	-P7-C40	-P7-C40-T1 -P7-C40-T2
068C/1676	Node P9	-P9-C38	-P9-C38-T1 -P9-C38-T2
068E/1678	Node P7	-P7-C38	-P7-C38-T1 -P7-C38-T2
0690/1680	Node P9	-P9-C37	-P9-C37-T1 -P9-C37-T2
0692/1682	Node P7	-P7-C37	-P7-C37-T1 -P7-C37-T2
0694/1684	Node P5	-P5-C39	-P5-C39-T1 -P5-C39-T2
0696/1686	Node P8	-P8-C39	-P8-C39-T1 -P8-C39-T2
0698/1688	Node P5	-P5-C40	-P5-C40-T1 -P5-C40-T2
069A/1690	Node P8	-P8-C40	-P8-C40-T1 -P8-C40-T2
069C/1692	Node P5	-P5-C38	-P5-C38-T1 -P5-C38-T2
069E/1694	Node P8	-P8-C38	-P8-C38-T1 -P8-C38-T2
06A0/1696	Node P5	-P5-C37	-P5-C37-T1 -P5-C37-T2
06A2/1698	Node P8	-P8-C37	-P8-C37-T1 -P8-C37-T2
06A4/1700	Node P6	-P6-C39	-P6-C39-T1 -P6-C39-T2
06A6/1702	Node P3	-P3-C39	-P3-C39-T1 -P3-C39-T2
06A8/1704	Node P6	-P6-C40	-P6-C40-T1 -P6-C40-T2
06AA/1706	Node P3	-P3-C40	-P3-C40-T1 -P3-C40-T2
06AC/1708	Node P6	-P6-C38	-P6-C38-T1 -P6-C38-T2
06AE/1710	Node P3	-P3-C38	-P3-C38-T1 -P3-C38-T2
06B0/1712	Node P6	-P6-C37	-P6-C37-T1 -P6-C37-T2
06B2/1714	Node P3	-P3-C37	-P3-C37-T1 -P3-C37-T2
06B4/1716	Node P2	-P2-C39	-P2-C39-T1 -P2-C39-T2
06B6/1718	Node P4	-P4-C39	-P4-C39-T1 -P4-C39-T2

Table 18. Converting the loop number to port location labels for a 9119-FHA (continued)

Loop number (hex / dec)	Model	FRU position	RIO/HSL/12X port labels on system unit or processor tower
<b>Nodes with RIO</b>			
06B8/1720	Node P2	-P2-C40	-P2-C40-T1 -P2-C40-T2
06BA/1722	Node P4	-P4-C40	-P4-C40-T1 -P4-C40-T2
06BC/1724	Node P2	-P2-C38	-P2-C38-T1 -P2-C38-T2
06BE/1726	Node P4	-P4-C38	-P4-C38-T1 -P4-C38-T2
06C0/1728	Node P2	-P2-C37	-P2-C37-T1 -P2-C37-T2
06C2/1730	Node P4	-P4-C37	-P4-C37-T1 -P4-C37-T2
<b>Nodes with 12x</b>			
0780/1920	Node P9	-P9-C39	-P9-C39-T1 -P9-C39-T2
0781/1921	Node P7	-P7-C39	-P7-C39-T1 -P7-C39-T2
0782/1922	Node P9	-P9-C40	-P9-C40-T1 -P9-C40-T2
0783/1923	Node P7	-P7-C40	-P7-C40-T1 -P7-C40-T2
0784/1924	Node P9	-P9-C38	-P9-C38-T1 -P9-C38-T2
0785/1925	Node P7	-P7-C38	-P7-C38-T1 -P7-C38-T2
0786/1926	Node P9	-P9-C37	-P9-C37-T1 -P9-C37-T2
0787/1927	Node P7	-P7-C37	-P7-C37-T1 -P7-C37-T2
0788/1928	Node P5	-P5-C39	-P5-C39-T1 -P5-C39-T2
0789/1929	Node P8	-P8-C39	-P8-C39-T1 -P8-C39-T2
078A/1930	Node P5	-P5-C40	-P5-C40-T1 -P5-C40-T2
078B/1931	Node P8	-P8-C40	-P8-C40-T1 -P8-C40-T2
078C/1932	Node P5	-P5-C38	-P5-C38-T1 -P5-C38-T2
078D/1933	Node P8	-P8-C38	-P8-C38-T1 -P8-C38-T2
078E/1934	Node P5	-P5-C37	-P5-C37-T1 -P5-C37-T2
078F/1935	Node P8	-P8-C37	-P8-C37-T1 -P8-C37-T2
0790/1936	Node P6	-P6-C39	-P6-C39-T1 -P6-C39-T2
0791/1937	Node P3	-P3-C39	-P3-C39-T1 -P3-C39-T2
0792/1938	Node P6	-P6-C40	-P6-C40-T1 -P6-C40-T2
0793/1939	Node P3	-P3-C40	-P3-C40-T1 -P3-C40-T2
0794/1940	Node P6	-P6-C38	-P6-C38-T1 -P6-C38-T2
0795/1941	Node P3	-P3-C38	-P3-C38-T1 -P3-C38-T2
0796/1942	Node P6	-P6-C37	-P6-C37-T1 -P6-C37-T2
0797/1943	Node P3	-P3-C37	-P3-C37-T1 -P3-C37-T2
0798/1944	Node P2	-P2-C39	-P2-C39-T1 -P2-C39-T2
0799/1945	Node P4	-P4-C39	-P4-C39-T1 -P4-C39-T2
079A/1946	Node P2	-P2-C40	-P2-C40-T1 -P2-C40-T2
079B/1947	Node P4	-P4-C40	-P4-C40-T1 -P4-C40-T2
079C/1948	Node P2	-P2-C38	-P2-C38-T1 -P2-C38-T2
079D/1949	Node P4	-P4-C38	-P4-C38-T1 -P4-C38-T2

Table 18. Converting the loop number to port location labels for a 9119-FHA (continued)

Loop number (hex / dec)	Model	FRU position	RIO/HSL/12X port labels on system unit or processor tower
<b>Nodes with RIO</b>			
079E/1950	Node P2	-P2-C37	-P2-C37-T1 -P2-C37-T2
079F/1951	Node P4	-P4-C37	-P4-C37-T1 -P4-C37-T2

## Fiber-optic cleaning procedures

Use the fiber-optic cleaning kit and the fiber-optic cleaning procedures in "SY27-2604 Fiber-Optic Cleaning Procedures" for all fiber channel connections such as those used in optical high speed link (HSL) connections or fibre channel attached devices.

See System parts.

**This ends the procedure.**

## Status indications for RIO/HSL

A status indication for a RIO/HSL loop is identified in the reference code.

Use the table below to determine if the status indication requires a service action. Record the rightmost four characters of word 4 of the reference code. These characters are the program return code (PRC), which indicates the RIO/HSL status. The leftmost four characters of word 7 indicate the RIO/HSL loop number (in hexadecimal format).

Table 19. Status indicated by the PRC

PRC	Indicated status
3204	A RIO error was detected, indicating that a RIO link failed. <ol style="list-style-type: none"> <li>To diagnose the error read through the transport manager flight recorder.</li> <li>Check the failing link. If the link shows not to have failed, check the devices connected to either end of the link.</li> </ol>
3205	During IPL, LIC determined that the loop was not complete. <ul style="list-style-type: none"> <li>This is expected if there are no I/O units on the loop.</li> <li>This error can also occur when an I/O unit, shared I/O unit, or another system on the loop did not complete powering on by the time this system's LIC checked the loop for completeness. As a result, you may see this error in the serviceable event view you are working with.</li> <li>When you find the same reference code logged from the same IPL against the same resource with a PRC of 3206 or 3208, the problem no longer exists. This can happen because the error was recovered when RIO/HSL hardware came on line, was properly configured, or the diagnostic code determined that there was not a problem based on the combination of machine types, features, configuration, and topology. In this case, you may close the problem entry.</li> <li>In IBM i, this error may also appear in the serviceable event view if any I/O units were removed from the loop without deleting the RIO/HSL I/O bridge resources of those units from Hardware Service Manager (HSM). The service procedure identified with the reference code that sent you here will help you determine if the loop is functioning correctly or if service is required.</li> <li>This error may also be caused by a problem in a rack, frame, or unit connected to the RIO/HSL loop if the problem prevents the unit from powering on or being detected by LIC. Follow the service procedures for this reference code. When necessary, you may be directed to work on other reference codes before returning to this procedure.</li> </ul>
3206	During normal operation an RIO/HSL loop recovered its redundant path. The loop is now complete.
3208	During normal operation an RIO/HSL I/O bridge recovered a failed link on the loop.

Table 19. Status indicated by the PRC (continued)

PRC	Indicated status
3209	See "Indicated status for PRC 3209" below.
3210	An RIO/HSL link switched to a slower speed. The link is designed to run at a faster speed based on the link's hardware and LIC levels at both ends. If there is a FRU list in the serviceable event view, use it to complete the repair action. If not, perform the following sections of this procedure below: <ol style="list-style-type: none"> <li>1. "Determining the RIO/HSL port label"</li> <li>2. "Replacing the link's failing end point FRUs" on page 26 (replace only the "From Frame ID" end point FRU)</li> </ol>

## Indicated status for PRC 3209

Recoverable CRC (cyclical redundancy check) errors have occurred on the loop. This error requires service action. An RIO/HSL cable or connection must be exchanged. Exchange only the cable that appears in the FRU list of this reference code in this document. If you are working from the serviceable event view, then only the FRU(s) required for this error will be displayed.

Choose from the following scenarios:

- If there is a serviceable event view entry with a cable FRU listed with a loop number, enclosure/unit ID, and port label identified with the cable FRU, then perform one of the following:
  - If the cable is optical, it is possible the optical connections need cleaning. You can choose either to clean the cable connections at each end without exchanging the cable, or to exchange the cable.
  - If the cable is copper, examine the screws that hold the connector at the end of the cable identified in the reference code or the first cable location listed in the serviceable event view entry. It is possible to get CRC errors when the connector screws are not tight. You can choose to tighten the cable connector screws without exchanging the cable only if they are loose. Otherwise, you must exchange the cable.
  - If neither of these actions resolves the problem, replace the FRUs in the serviceable event view one at a time.

**This ends the procedure.**

- If the serviceable event view entry does not list any cable FRUs, then exchange the failing items listed in the serviceable event view entry by following the normal service procedures for those FRUs. This will be the case when the RIO/HSL connection is embedded.

**This ends the procedure.**

- If the serviceable event view entry has cable FRU(s) listed, but the loop number, enclosure/unit ID, and port label are not all listed with the cable FRU, go to "Determining the RIO/HSL port label" below.

## Determining the RIO/HSL port label

Retrieve and record the following information:

- **Loop number.** The loop number is displayed in hexadecimal format as the four leftmost digits of word 7 in the reference code. Convert the loop number to decimal format using "DSA translation" on page 6. Record both the hexadecimal and decimal formats of the loop number. If the loop is an internal loop on a 515, 520, 525, or 570 (loops 0680, 0683, 0686, 0689 hexadecimal or 1664, 1667, 1670, 1673 decimal), then record "Internal".
- **Frame ID.** The frame ID is displayed in hexadecimal format as the four leftmost digits of word 5 of the reference code. You must convert the frame ID to decimal format to match what is displayed in user interfaces and problem views. Record both the hexadecimal and decimal formats of the frame ID. If the frame ID is not zero, then translate the frame ID into the correct machine type, model, and serial number by performing the following:

1. Log on to SST/DST.  
**Attention:** Do not IPL to DST.
2. Select **Hardware Service Manager**.
3. Select **Packaging resources**.
4. Selecting **Display details** for each unit listed until the frame ID matches the ID you are working with. Once you find the matching frame ID, record the unit's machine type, model, and serial number.

**Note:** The frame has an ID of 0000 at this point in the procedure. A frame ID of zero is indicating the NIC/RIO controller in a system unit.

- **Port number indicator.** The port number indicator is the four rightmost digits of word 5 of the reference code.

Use the frame ID and port number indicator in the following table to determine the RIO/HSL port label. If you are referred to "Converting the loop number to RIO/HSL/12X port location labels" on page 15, the failing item is in a system unit. You will need the RIO/HSL loop number to determine the FRU.

The following tables provide hub, port, and location code information for each of the currently supported models. This data is used to determine which RIO loop to use for the B7006981. The asterisk in the "Port indicator number" column indicates the leading port of the port pair.

*Table 20. Determining which RIO/HSL port label to use on a 8203-E4A, 9407-M15, 9408-M25, 8204-E8A, and 9409-M50,*

Model number	Loop number	Hub	Port indicator number	Location code
8203-E4A, 9407-M15, and 9408-M25	1668	0	0*	"Internal"
			1	"Internal"
	1669		2*	P1-T4
	3		P1-T3	
8204-E8A and 9409-M50	1668	0	0*	"Internal"
			1	"Internal"
	1669		2*	P1-T12
	3		P1-T11	
	1676		4	0
1	P1-C6-T1 (In an expansion card not-onboard)			

*Table 21. Determining which RIO/HSL port label to use on a 9117-MMA, and 9406-MMA*

Model number	Loop number	CEC	Hub	Port indicator number	Location code
9117-MMA, and 9406-MMA	1668	0	0	0*	"Internal" (Top CEC)
				1	"Internal"
	1669	0	0	2*	P1-T8
				3	P1-T9
	1676	0	4	0*	P1-C7-T2
1				P1-C7-T1	

Table 21. Determining which RIO/HSL port label to use on a 9117-MMA, and 9406-MMA (continued)

Model number	Loop number	CEC	Hub	Port indicator number	Location code
9117-MMA, and 9406-MMA	1684	1	8	0*	"Internal" (Second down)
				1	"Internal"
	1685	1	8	2*	P1-T8
				3	P1-T9
	1692	1	12	0	P1-C7-T2
				1	P1-C7-T1
9117-MMA, and 9406-MMA	1700	2	16	0*	"Internal" (Third down)
				1	"Internal"
	1701	2	16	2*	P1-T8
				3	P1-T9
	1708	2	20	0	P1-C7-T2
				1	P1-C7-T1
9117-MMA, and 9406-MMA	1716	3	24	0*	"Internal" (Fourth down)
				1	"Internal"
	1717	3	24	2*	P1-T8
				3	P1-T9
	1724	3	28	0	P1-C7-T2
				1	P1-C7-T1

Table 22. Determining which RIO/HSL port label to use on a 9125-F2A

Model number	Loop number	Hub	Port indicator number	Location code
9125-F2A	1668	0	0*	"Internal"
			1	"Internal"
	1669		2*	P1-T7
			3	P1-T8

Table 23. Determining which RIO/HSL port label to use on a 9119-FHA

Model number	Loop number	Hub	Port indicator number	Location code
9119-FHA	1668	0	0*	"Internal" FSPA
			1	"Internal"
	1669	0	2*	P1-C1-T1
			3	P1-C1-T2
	1670	1	0*	"Internal" FSPB
			1	"Internal"
	1671	1	2*	P1-C3-T1
			3	P1-C3-T2
	1672	2	2*	P1-C5-T1
			3	P1-C5-T2
	1674	3	2*	P1-C6-T1
			3	P1-C6-T2
	1676	4	2*	P1-C8-T1
			3	P1-C8-T2
	1678	5	2*	P1-C9-T1
			3	P1-C9-T2
	1680	6	2*	P1-C11-T1
			3	P1-C11-T2
1682	7	2*	P1-C13-T1	
		3	P1-C13-T2	

Table 23. Determining which RIO/HSL port label to use on a 9119-FHA (continued)

Model number	Loop number	Hub	Port indicator number	Location code
9119-FHA	1684	8	0*	"Internal" FSB (Second node position)
			1	"Internal"
	1685	8	2*	P1-C1-T1
			3	P1-C1-T2
	1686	9	0*	"Internal" FSPA
			1	"Internal"
	1687	9	2*	P2-C3-T1
			3	P2-C3-T1
	1688	10	2*	P2-C5-T1 (Optional card, no HSL)
			3	P2-C5-T2
	1690	11	2*	P2-C6-T1 (Required empty airflow)
			3	P2-C6-T2
	1692	12	2*	P2-C8-T1
			3	P2-C8-T2
	1694	13	2*	P2-C9-T1
			3	P2-C9-T2
1696	14	2*	P2-C11-T1	
		3	P2-C11-T2	
1698	15	2*	P2-C13-T1	
		3	P2-C13-T2	
9119-FHA	1700	16	2*	P3-C1-T1 (Third position)
			3	P3-C1-T2
	1702	17	2*	P3-C3-T1
			3	P3-C3-T2
	1704	18	2*	P3-C5-T1
			3	P3-C5-T2
	1706	19	2*	P3-C6-T1
			3	P3-C6-T2
	1708	20	2*	P3-C8-T1
			3	P3-C8-T2
	1710	21	2*	P3-C9-T1
			3	P3-C9-T2
	1712	22	2*	P3-C11-T1
			3	P3-C11-T2
	1714	23	2*	P3-C13-T2
			3	P3-C13-T2

Table 23. Determining which RIO/HSL port label to use on a 9119-FHA (continued)

Model number	Loop number	Hub	Port indicator number	Location code
9119-FHA	1716	24	2*	P4-C1-T1
			3	P4-C1-T2
	1718	25	2*	P4-C3-T1
			3	P4-C3-T2
	1720	26	2*	P4-C5-T1
			3	P4-C5-T2
	1722	27	2*	P4-C6-T1
			3	P4-C6-T2
	1724	28	2*	P4-C8-T1
			3	P4-C8-T2
	1726	29	2*	P4-C9-T1
			3	P4-C9-T2
	1728	30	2*	P4-C131-T1
			3	P4-C11-T2
	1730	31	2*	P4-C13-T1
			3	P4-C13-T2

**Note:** For 570, exchange the FRU on the correct unit (primary or secondary) by matching the serial number (if available in the FRU list on the serviceable event view) or by matching the loop number to the correct unit using “Converting the loop number to RIO/HSL/12X port location labels” on page 15.

## Determining if the cable is the cause of the problem

If there is a cable attached to the failing port:

- If the cable is optical, it is possible the optical connections need cleaning. You can choose either to clean the cable connections at each end without exchanging the cable, or to exchange the cable.
- If the cable is copper, examine the screws that hold the connector at the end of the cable identified in the reference code or the first cable location listed in the serviceable event view entry. It is possible to get CRC errors when the connector screws are not tight. You can choose to tighten the cable connector screws without exchanging the cable only if they are loose. Otherwise, you must exchange the cable.
- If neither of these actions resolves the problem, replace the cable. Perform “RIOIP08” on page 38 to determine the frame ID and RIO/HSL port label of the other end of the cable you will be exchanging (if you do not already know). Does this correct the problem?

**Yes: This ends the procedure.**

**No:** Continue with replacing the FRUs that the cable is connected to, starting with the FRU listed first.

## Replacing the link’s failing end point FRUs

Use the following table to determine the end point FRUs on the “From Frame ID” port. Replace the FRUs one at a time.

If replacing the end point FRUs for the “From Frame ID” port does not resolve the error, use the table below to replace the end point FRUs at the other end of the cable. Perform “RIOIP08” on page 38 to determine the system or I/O unit frame ID and RIO/HSL port label of the other end of the cable (if you

do not already know).

Table 24. End point FRUs

Model	Loop number (hexadecimal / decimal)	End point FRUs
8203-E4A, 9407-M15, 9408-M25, 9117-MMA and 9406-MMA	0680 / 1664	The loop is embedded in the system unit planar. Exchange the system unit planar.
8203-E4A, 9407-M15, 9408-M25, 9117-MMA and 9406-MMA	0681 / 1665	For all port number values, the loop's NIC/RIO controller is embedded in the system unit planar. Exchange the system unit planar.
9117-MMA and 9406-MMA	0682 / 1666	For all port number values, the loop's NIC/RIO controller is in the NIC/RIO controller card. Exchange the NIC/RIO controller.
9117-MMA and 9406-MMA	0683 / 16670686 / 16700689 / 1673	The loop is embedded in the system unit planar. Exchange the system unit planar. <b>Note:</b> Exchange the FRU on the correct unit (primary or secondary) by matching the serial number (if available in the FRU list on the serviceable event view) or by matching the loop number to the correct unit using "Converting the loop number to RIO/HSL/12X port location labels" on page 15.

This ends the procedure.

## RIO/HSL/12X connection problems

The failing component is the RIO/HSL/12X connection

When a RIO/HSL cable is disconnected, it may result in a lost connection between the units even after the cable is reconnected.

**Attention:** To fix this problem, you need to cycle power on the unit with the locked RIO/HSL connection. See Powering on and powering off the system . This problem does not occur with 12X cables.

**Note:** If question marks (???) appear at the end of the location code, then the port could not be determined. Use the location code associated with the other end of the cable. If question marks appear for both port locations, use the isolation procedures suggested in the reference code table for this SRC.

1. Choose from the following:

- If you were sent to this procedure from another symbolic FRU, locate that FRU in Table 25 on page 28 to see the description of the RIO/HSL/12X FRU. Then continue with the next step for more information about the FRU.
- If you are working with this symbolic FRU in the FRU list, the failing component is an RIO/HSL/12X connection. Diagnostic code could not determine what kind of hardware was involved. The RIO/HSL/12X hardware can be any of the following:
  - Cable
  - Embedded RIO/HSL/12X link in a FRU (a planar, for example)
  - RIO/HSL/12X interposer card

The RIO/HSL/12X link is on or between the other FRU or FRUs listed for the reference code. Continue with the next step.

Table 25. RIO/HSL symbolic FRUs

RIO/HSL FRU	Description
HSL_OPT	<p>This is an optical RIO/HSL cable.</p> <p>When exchanging optical RIO/HSL cables, use the optical cleaning kit and procedures. See “Fiber-optic cleaning procedures” on page 20 for details.</p> <p>If an interposer card is called for, be sure the interposer type matches the cable type (optical or copper).</p>
HSL1	There is a standard copper RIO/HSL cable at both ends (yellow connectors).
HSL1_UN	There is a standard copper RIO/HSL cable (yellow connector) at the detecting end, and an unknown connector type at the other end.
HSL2	There is a copper HSL2/RIO-G cable at both ends (black connectors), but the length of the cable could not be sensed.
HSL2_xx	<p>There is a copper HSL2/RIO-G cable at both ends (black connectors). Use the xx value to determine the cable length from this list:</p> <ul style="list-style-type: none"> <li>• HSL2_01 = 1 meter HSL2 cable</li> <li>• HSL2_03 = 3 meter HSL2 cable</li> <li>• HSL2_08 = 8 meter HSL2 cable</li> <li>• HSL2_10 = 10 meter HSL2 cable</li> <li>• HSL2_15 = 15 meter HSL2 cable</li> <li>• HSL2_17 = 1.75 meter HSL2 cable</li> <li>• HSL2_25 = 2.5 meter HSL2 cable</li> </ul>
HSLH	There is a hybrid RIO/HSL to HSL2/RIO-G cable (yellow connector at one end and black connector at the other end), but the length of the cable could not be sensed.
HSL_IB	This is an 12X cable (green connectors).
HSLH_xx	<p>There is a hybrid RIO/HSL to HSL2/RIO-G cable (yellow connector at one end and black connector at the other end). Use the xx value to determine the cable length from this list:</p> <ul style="list-style-type: none"> <li>• HSLH_06 = 6 meter HSL/RIO to HSL2/RIO-G cable</li> <li>• HSLH_15 = 15 meter HSL/RIO to HSL2/RIO-G cable</li> </ul>
HSL_I	There is a RIO/HSL interposer card for HSL/RIO cables (yellow connectors), HSL2/RIO-G cables (black connectors), or optical cables. The interposer card type could not be sensed.
HSL_I2 HSL_I3 HSL_I4	<p>There is a RIO/HSL interposer card for HSL/RIO cables (yellow connectors), HSL2/RIO-G cables (black connectors), or optical cables. Use the x value to determine the interposer card type from this list:</p> <ul style="list-style-type: none"> <li>• HSL_I2 = Copper HSL2/RIO-G interposer card for HSL2/RIO-G cable connectors (black) in the system unit backplane position C08 or C09 of machine type 9406 model 825.</li> <li>• HSL_I3 = Optical HSL/RIO interposer card for optical RIO/HSL cables in system unit backplane position C08 or C09 of machine type 9406 model 825.</li> <li>• HSL_I4 = HSL2/RIO-G interposer/riser card on a 7040-61D I/O unit in location -P1-Riser or -P2-(Riser).</li> </ul>

2. Choose from the following options:

- If you are working from the serviceable event view, the location code or FRU description in the view will help determine the actual RIO/HSL/12X hardware to exchange. Continue with the next step.
- If you are not working from the serviceable event view, or the view does not have a location code or better FRU description, then determine the location code of other FRUs in the FRU list for the error. Then continue with the next step.

3. Use the location code and the information from the preceding table to determine the machine type, model, or unit feature involved in the error. If necessary, use the location code for other FRUs listed in

the FRU list for this error to determine the failing RIO/HSL/12X connection and any related FRUs that are part of that connection. Use System FRU locations to find links to the locations information. Refer to the *Parts Information* chapter of the Service Guide for the failing machine type/model for part number information.

**Note:** If you exchange all of the FRUs in the FRU list, but the problem still exists, contact your next level of support. You may be directed to exchange additional RIO/HSL/12X FRUs. “Additional RIO/HSL FRUs” has more information about RIO/HSL/12X FRUs on specific models and I/O units.

## Additional RIO/HSL FRUs

The following are RIO/HSL/12X FRUs by model and/or unit type. For the model or unit type you are working on, there may be additional RIO/HSL/12X FRUs which were not listed in the FRU list of the error. Under the direction of your next level of support, you can try exchanging the additional FRUs.

1. In the following table, locate the unit type(s) on which you are working. Exchange the indicated RIO/HSL/12X loop connections (external or embedded) or RIO/HSL/12X interposer card.
2. Did the exchange correct the error?
  - **Yes:** The FRU you just replaced was the failing item. Go to Verify a repair.  
**This ends the procedure.**
  - **No:** Call your next level of support.  
**This ends the procedure.**

*Table 26. RIO/HSL/12X cable or connections.* To find locations information, refer to System FRU locations or the service guide for the I/O enclosure.

System model or unit type	Description	Location code
5094, 5096, 5294, 5296	HSL (optical) I/O bridge adapter	Un-CB1-C10
5094, 5096, 5294, 5296	HSL I/O bridge card	Un-CB1-C10
5094, 5096, 5294, 5296	HSL-2 I/O bridge adapter	Un-CB1-C10
7311-D11, 5790	RIO/HSL adapter	Un-P1-C7
0595, 5095	HSL (optical) I/O bridge adapter	Un-P1-C5
7311-D20, 0595, 5095	RIO/HSL I/O bridge adapter	Un-P1-C5
7311-D20, 0595, 5095	RIO/HSL-2 I/O bridge adapter	Un-P1-C5
7314-G30, 5796	Dual-port 12X adapter	Un-P1-C7
1519	Integrated xSeries® Adapter	

## Powering on and powering off an I/O expansion unit

Follow these steps if you disconnected an RIO/HSL cable from an I/O expansion unit, and the RIO/HSL link on the unit did not recover when you reconnected the cable:

1. From the Hardware Service Manager screen, select **Packaging hardware resources**.
2. Select the frame that has just accidentally lost its RIO/HSL connection and select **Concurrent maintenance**. Then press **Enter**.
3. Select **Power off domain**.
4. After reconnecting the unit into the RIO/HSL loop, select **Power on domain**.

## HSL loop configuration and status form

Use this HSL loop configuration and status form to record the status of the HSL ports in the loop.

**Note:** You may copy this form as necessary.



	Column A (starting status)		Column B	Column C (column A is failed and column B is failed)	Column D	Column E (column B is failed and column D is failed)
Resource with failing link	Port info	Port status	Port status		Port status	
First	Frame ID _____	Port _0 (or internal)	Port _0 (or internal)		Port _0 (or internal)	
	Card Position _____					
	Port # _____	Port _1 (or internal)	Port _1 (or internal)		Port _1 (or internal)	
Second	Frame ID _____	Port _0 (or internal)	Port _0 (or internal)		Port _0 (or internal)	
	Card Position _____					
	Port # _____	Port _1 (or internal)	Port _1 (or internal)		Port _1 (or internal)	

## CONSL01

Use this procedure to exchange the I/O processor (IOP) for the system or partition console of i5/OS®.

1. Is the system managed by an HMC?

**No:** Go to step 6 on page 32.

**Yes:** The HMC will be required for this procedure. Move to the HMC and continue with the next step only if the HMC is functional.

2. Can the customer power off the partition at this time?

**Yes:** Power off the partition from the operating system console or the HMC. Then, continue with the next step.

**No:** The IOP controlling the partition's console may be controlling other critical resources. The partition must be powered off to exchange this IOP. Perform this procedure when the customer is able to power off the partition. Then, continue with the next step.

3. Perform the following to determine the unit machine type, model, and serial number where the console IOP is located and the location of the console IOP:
  - a. From the *Navigation Area* of the HMC, select the **Management Environment**.
  - b. Select and expand the HMC environment for this HMC.
  - c. Select and expand **Server and Partition**.
  - d. Select **Server Management**.
  - e. Double-click the i5/OS partition you are working on.
  - f. Select the **Settings** tab.

- g. Record the location of the load source IOP. The unit type, model, and serial number are the first three parts of the location code and are separated by periods.
  - h. Continue with the next step.
4. Record the frame type or feature by using the frame ID and system configuration listing or by locating the frame with that ID and recording the frame type or feature.
  5. Perform the following to exchange the IOP in that card position:
    - a. Go to System FRU locations and select the unit type and model that you recorded.
    - b. Locate the card position in the FRU locations table and use the exchange procedure that is identified.
    - c. Power on the partition.

**This ends the procedure.**

6. The problem is in the i5/OS partition of a system with one or more partitions that is not managed by an HMC. Use the table below to determine the location of the load source IOP and the appropriate exchange procedure.

Model	Load source IOP location	Load source IOA location	Link to locations information
MMA	-P1-C1	embedded SCSI in -P1	System FRU locations

**This ends the procedure.**

## RIOIP01

Use this procedure to isolate a failure in a RIO/HSL/12X loop using IBM i service tools.

Follow the steps in the “Main task” and you will be directed to the proper subtasks.

**Note:** During this procedure, you will be disconnecting and reconnecting cables. If errors concerning missing resources (such as disk units and RIO/HSL/12X failures) occur, ignore them. Missing resources will report in again when the loop reinitializes.

### Main task

1. Were you sent here from a B600 xxxx reference code?
  - No:** Continue with the next step.
  - Yes:** Use the serviceable event view and the system service documentation to search for a B700 xxxx reference code with the same last four characters reported at approximately the same time. If you find one, perform service on that reference code first, and when you close that problem, close this one as well. If you do not find one, continue with the next step.
2. Before powering down any system unit or expansion unit, work with the customer to end all subsystems in all of the partitions using each partition’s console.
3. From the partition control panel, IPL the system or partition to Dedicated Service Tools (DST).
  - Attention:** Do not use function 21!
4. Are all system and expansion units on the loop powered on?
  - Yes:** Go to step 6 on page 33.
  - No:** Continue with the next step.
5. Perform the following:
  - a. Power on all system and expansion units on the loop. If a frame cannot be powered on, perform the “Cannot power on unit” on page 36 subtask below, and then continue with step 6 on page 33.
  - b. Was the RIO/HSL/12X link error cleared up when the frames were powered back on?
    - **No:** Continue with the next step.
    - **Yes:** Go to Verify a repair.

**This ends the procedure.**

6. Perform the following:
  - a. Access the Service Action Log (SAL) entry for this error; the field replaceable units (FRUs) should be listed there. Look for part numbers and descriptions for the FRUs containing the RIO/HSL/12X port for two frames. There should also be a FRU for the cable between them. The locations information for the FRUs is the location of the failed ports on the failed link.
  - b. Record the loop number from the SAL (if it is displayed there in one of the FRU descriptions) or from the first four characters of word 7 of the reference code. Go to "Converting the loop number to RIO/HSL/12X port location labels" on page 15 to determine which RIO/HSL/12X cables on the system you are working with.

Is this information in the SAL?

**Yes:** Continue with the next step.

**No:** Perform "Manually detecting the failed link" on page 36 below, and then continue with the next step of the main task.
7. Is the cable connecting the failed ports an optical cable?

**No:** Go to step 9.

**Yes:** Continue with the next step.
8. Perform the following:
  - a. Clean the RIO/HSL/12X cable connectors and ports using the fiber optic cleaning kit and the fiber-optic cleaning procedures in "SY27-2604 Fiber Optic Cleaning Procedures".
  - b. To determine if cleaning the connectors and ports solved the problem, perform "Manually detecting the failed link" on page 36 below and return to this point. Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verify a repair. **This ends the procedure.**

**Yes:** Continue with the next step.
9. There are now three cases to consider. Continue with the appropriate subtask of this procedure:
  - "The ports on both ends of the failed link are in different system units on the loop."
  - "The port on one end of the failed link is in a system unit and the port on the other end is in an I/O unit" on page 34.
  - "The ports on both ends of the failed link are in an I/O unit" on page 35.

**The ports on both ends of the failed link are in different system units on the loop**

1. There may be failed hardware that will report a different error on the other system units. Perform the following:
  - a. Resolve any other RIO/HSL/12X problems in the serviceable event view on the other system units.
  - b. Perform "Manually detecting the failed link" on page 36 below and return to this point. Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verify a repair. **This ends the procedure.**

**Yes:** Continue with the next step.
2. Is the cable an optical RIO/HSL/12X cable?

**Yes:** Go to step 4 on page 34.

**No:** Continue with the next step.
3. Perform the following:
  - a. Verify that the cables are connected securely. For any cable that was loose, disconnect the cable at that end, wait 30 seconds, and reconnect the cable securely. If there are thumbscrews, you must tighten both thumb screws within 30 seconds of when the cable makes contact with the port.

- b. If you disconnected and reconnected the cable at either end, perform “Manually detecting the failed link” on page 36 below and return to this point. Did the ports you were working on have a status of “failed”?

**No:** Then the problem is fixed, go to Verify a repair. **This ends the procedure.**

**Yes:** Continue with the next step.

4. Replace the cable between the two system unit ports on the failed link. To determine if replacing the cable resolved the problem, perform “Manually detecting the failed link” on page 36 below and return to this point. Did the ports you were working on have a status of “failed”?

**No:** Then the problem is fixed, go to Verify a repair. **This ends the procedure.**

**Yes:** Continue with the next step.

5. Exchange the FRU with the RIO/HSL/12X port in one of the system units. If you are working with a serviceable event view and the RIO/HSL/12X FRUs are listed, exchange the FRU corresponding to the first RIO/HSL/12X cable port listed. Otherwise, exchange the FRU that is quickest and easiest to replace). To determine if replacing the FRU resolved the problem, perform “Manually detecting the failed link” on page 36 below and return to this point. Did the ports you were working on have a status of “failed”?

**No:** Then the problem is fixed, go to Verify a repair. **This ends the procedure.**

**Yes:** Continue with the next step.

6. Exchange the remaining FRU with the RIO/HSL/12X port on the other system unit. To determine if replacing the FRU resolved the problem, perform “Manually detecting the failed link” on page 36 below and return to this point. Did the ports you were working on have a status of “failed”?

**No:** Then the problem is fixed, go to Verify a repair. **This ends the procedure.**

**Yes:** Continue with the next step.

7. Use the procedure “RIO/HSL/12X connection problems” on page 27 to determine if there are any additional RIO/HSL/12X cable-related FRUs, such as interposer cards and internal ribbon cables, that may be on either unit. Did you exchange any additional RIO/HSL/12X FRUs?

**No:** Call your next level of support for further instruction. **This ends the procedure.**

**Yes:** Continue with the next step.

8. To determine if replacing the FRU resolved the problem, perform “Manually detecting the failed link” on page 36 below and return to this point. Did the ports you were working on have a status of “failed”?

**No:** Then the problem is fixed, go to Verify a repair. **This ends the procedure.**

**Yes:** Call your next level of support for further instruction. **This ends the procedure.**

### **The port on one end of the failed link is in a system unit and the port on the other end is in an I/O unit**

1. Switch the two RIO/HSL/12X cables on the I/O unit with the failed port, so that each cable is connected to the port where the other cable was previously connected. Disconnect both cables at the same time, wait 30 seconds, and then reconnect the cables one at a time.

**Attention:** For copper cables with thumbscrews, you must fully connect the cable and tighten the connector’s screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.

2. Refresh the port status for the first failing resource by performing “Refresh the port status” on page 37 below. Then continue with the next step.

3. Is the port on the system unit that was failed now working?

**No:** Continue with the next step.

**Yes:** Exchange the RIO/HSL/12X bridge FRU in the I/O unit. Go to Verify a repair. **This ends the procedure.**

4. Switch the cables back to their original positions by disconnecting both cables at the same time, waiting 30 seconds, and then reconnecting the cables one at a time.  
**Attention:** For copper cables with thumbscrews, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.
5. Exchange the cable between the two ports on the failed link. To determine if replacing the cable resolved the problem, perform "Manually detecting the failed link" on page 36 below and return to this point. Did the ports you were working on have a status of "failed"?  
**No:** Then the problem is fixed, go to Verify a repair. **This ends the procedure.**  
**Yes:** Continue with the next step.
6. Use the procedure "RIO/HSL/12X connection problems" on page 27 to determine if there are any additional RIO/HSL/12X cable-related FRUs, such as interposer cards and internal ribbon cables, that may be on either unit. Did you exchange any additional RIO/HSL/12X FRUs?  
**No:** Call your next level of support for further instruction. **This ends the procedure.**  
**Yes:** Continue with the next step.
7. Exchange the RIO/HSL/12X FRU that contains the failing port in the system unit. To determine if replacing the FRU resolved the problem, perform "Manually detecting the failed link" on page 36 below and return to this point. Did the ports you were working on have a status of "failed"?  
**No:** Then the problem is fixed, go to Verify a repair. **This ends the procedure.**  
**Yes:** Continue with the next step.
8. To determine if replacing the FRU resolved the problem, perform "Manually detecting the failed link" on page 36 below and return to this point. Did the ports you were working on have a status of "failed"?  
**No:** Then the problem is fixed, go to Verify a repair. **This ends the procedure.**  
**Yes:** Call your next level of support for further instruction. **This ends the procedure.**

### The ports on both ends of the failed link are in an I/O unit

1. Switch the two RIO/HSL/12X cables on the first (or "From") cable's I/O unit with the failed port so that each cable is connected to the port where the other cable was previously connected.  
**Attention:** For copper cables with thumbscrews, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.
2. Refresh the port status for the first failing resource by performing "Refresh the port status" on page 37 below. Then continue with the next step.
3. Is the port on the I/O unit on which you did not switch the cables now working?  
**No:** Go to step 5  
**Yes:** Exchange the RIO/HSL/12X I/O bridge card in the I/O unit where you just switched the cables. The continue with the next step.
4. To determine if replacing the FRU resolved the problem, perform "Manually detecting the failed link" on page 36 and return to this point. Did the ports you were working on have a status of "failed"?  
**No:** Then the problem is fixed, go to Verify a repair. **This ends the procedure.**  
**Yes:** Continue with the next step.
5. Switch the cables back to their original positions.  
**Attention:** For copper cables with thumbscrews, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.

6. Switch the two RIO/HSL/12X cables on the second (or "To") I/O unit with the failed port so that each cable is connected to the port where the other cable was previously connected.  
**Attention:** For copper cables with thumbscrews, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.
7. Refresh the port status for the first failing resource by performing "Refresh the port status" on page 37. Then continue with the next step.
8. Is the port on the I/O unit on which you did not switch cables now working?  
**No:** Go to step 10.  
**Yes:** Exchange the RIO/HSL/12X I/O bridge card in the I/O unit where you just switched the cables. Then continue with the next step.
9. To determine if replacing the FRU resolved the problem, perform "Manually detecting the failed link" below and return to this point. Did the ports you were working on have a status of "failed"?  
**No:** Then the problem is fixed, go to Verify a repair. **This ends the procedure.**  
**Yes:** Continue with the next step.
10. Switch the cables back to their original positions.  
**Attention:** For copper cables with thumbscrews, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.
11. Exchange the RIO/HSL/12X cable between the two ports on the failed link. To determine if replacing the cable resolved the problem, perform "Manually detecting the failed link," then return to this point.  
 Did the ports you were working on have a status of "failed"?  
**No:** Then the problem is fixed, go to Verify a repair. **This ends the procedure.**  
**Yes:** Continue with the next step.
12. Use the procedure "RIO/HSL/12X connection problems" on page 27 to determine if there are any additional RIO/HSL/12X cable-related FRUs, such as interposer cards and internal ribbon cables, that may be on either unit. Did you exchange any additional RIO/HSL/12X FRUs?  
**No:** Call your next level of support for further instruction. **This ends the procedure.**  
**Yes:** Continue with the next step.
13. To determine if replacing the FRU resolved the problem, perform "Manually detecting the failed link" below and return to this point. Did the ports you were working on have a status of "failed"?  
**No:** Then the problem is fixed, go to Verify a repair. **This ends the procedure.**  
**Yes:** Call your next level of support for further instruction. **This ends the procedure.**

### Cannot power on unit

1. Work the errors related to powering on the unit(s), and then continue with the next step. If a unit still cannot be powered on, re-cable the RIO/HSL/12X loop without the I/O units and system units that cannot be powered on, allowing the loop to be complete (no disconnected cables).
2. To determine if re-cabling the loop resolved the problem, perform "Manually detecting the failed link" below and return to this point.

### Manually detecting the failed link

1. Get the loop number from the reference code if you do not already have it. The loop number is a hexadecimal number in word 7 of the reference code.
  - If you are working from the Product Activity Log (PAL), then the loop number is the 4 leftmost characters of the DSA in word 7 (BBBB). The loop number is in hexadecimal. Convert the hexadecimal loop number to decimal format before continuing with this procedure.

- If you are working from the Service Action Log (SAL), the loop number should be displayed in the FRU description area in decimal format.
2. Sign on to SST or DST (if you have not already done so). Select **Start a service tool** → **Hardware service manager** → **Logical hardware resources** → **High-speed link (HSL) resources**.
  3. Select **Resources associated with loop** for the RIO/HSL/12X loop with the failed link. The RIO/HSL/12X bridges will be displayed under the loop.
  4. Select **Display detail** for the loop with the failed link.
  5. Record the name of the NIC/RIO controller resource you are starting from on the display. You will need to know this name to determine if you have followed the loop around and back to this resource.
  6. If the leading port does not have a status of *"failed"*, select **Follow leading port** until a leading port with a *"failed"* status is found, or the display is showing information for the starting NIC/RIO resource you recorded. Did you find a leading port with a status of *"failed"*?
    - No:** The loop is functioning properly. Return to the subtask that sent you here.
    - Yes:** Record the resource name at the leading port with a *"failed"* status, and the type, model, and serial number for the resource with the failed status. Continue with the next step.
  7. Select **Follow leading port** one more time and note all the information for the resource name with a failed trailing port.
  8. Select **Display system information** and note the power controlling system's type, model, and serial number (and name, if available). This info may be needed for FRU replacement at a later time.
  9. Select **Cancel** twice to return to the previous screen.
  10. Go to each resource name (found above) and select **Associated packaging resource(s)**. This gives the description of the failing item and the unit ID.
  11. Select **Display detail** to find the part number and location associated with the possible failing item. Then return to the step that sent you here.

## Refresh the port status

1. Wait one minute, and then sign on to SST or DST (if you have not already done so).
2. Select **Start a service tool** → **Hardware service manager** → **Logical hardware resources** → **High-speed link (HSL) resources**.
3. Move the cursor to the RIO/HSL/12X loop that you want to examine and select **Display detail** → **Include non-reporting resources**.
4. If the display is not already showing the ports for one of the units you are working on, then select **Follow leading port**. Continue to select **Follow leading port** until the display is showing the ports for one of the units you are working on. Note the status of the port you were working on. Select **Follow leading port** until the display is showing the ports for the other unit you are working on, and note the status of the port you were working on.
5. Select **Cancel** → **Refresh** → **Display detail** for the failing resource you are checking. Note any change in the status for the resource. Then return to the step that sent you here.

## RIOIP06

Use HSM to examine the RIO/HSL/12X Loop to determine if other systems are connected to the loop.

1. Sign on to SST or DST (if you have not already done so).
2. Select **Start a service tool** → **Hardware service manager** → **Logical hardware resources** → **High-speed link (HSL) resources**.
3. Move the cursor to the RIO/HSL/12X loop that you want to examine, and select **Resources associated with loop**.
4. Search for Remote RIO/HSL/12X NICs on the loop.  
Are there any Remote RIO/HSL/12X NICs on the loop?

**Yes:** You have determined that there **are** other systems connected to this loop. **This ends the procedure.**

**No:** You have determined that there are **not** any other systems connected to this loop. **This ends the procedure.**

## RIOIP08

Starting with the unit ID and RIO/HSL/12X port for one end of an RIO/HSL/12X cable, determine the unit ID and port location for the other end.

1. Sign on to SST or to DST if you have not already done so.
2. Select **Start a Service Tool** → **Hardware Service Manager** → **Logical Hardware Resources** → **High Speed Link (HSL) Resources**.
3. Move the cursor to the RIO/HSL/12X loop that you want to examine, and select **Resources associated with loop** → **Include non-reporting resources**. The display that appears shows the loop resource and all the "HSL I/O Bridge" and all the "Remote HSL NIC" resources connected to the loop.
4. Perform the following for each of the HSL I/O Bridge resources listed until you are directed to do otherwise.
  - a. Move the cursor to the HSL I/O Bridge resource and select **Associated packaging resource(s)**.
  - b. Compare the unit ID on the display with the unit ID (in hexadecimal format) that you started with.

Are the unit IDs the same?

**Yes:** Continue with the next step.

**No:** Select **Cancel** to return to the Logical Hardware Associated with HSL Loops display. Repeat this for each HSL I/O Bridge under the loop, until you are directed to do otherwise.
5. Perform the following:
  - a. Select **Associated logical resource(s)**.
  - b. Move the cursor to the HSL I/O Bridge resource and select **Display detail**.
  - c. Examine the *Leading port* and *Trailing port* information. Search the display for the RIO/HSL/12X port location label that you recorded prior to starting this procedure. If the label is part of the information for the *Leading port*, then select **Follow leading port**. If the label is part of the information for the *Trailing port*, then select **Follow trailing port**.
  - d. Perform the step below that matches the function you selected in the previous step:
    - If you selected **Follow leading port**, then examine the display for the *Trailing port* information. Record, on the worksheet that you are using, the RIO/HSL/12X port location label shown on the "*Trailing port from previous resource*" line. Record this information as the "*To HSL Port Label*".
    - If you selected **Follow trailing port**, then examine the display for the *Leading port* information. Record, on the worksheet that you are using, the RIO/HSL/12X port location label on the "*Leading port to next resource*" line. Record this information as the "*To HSL Port Label*".
  - e. Record the "*Link type*" (Copper or Optical) on the worksheet that you are using in the field describing the cable type.
  - f. Select **Cancel** → **Cancel** → **Cancel** to return to the *Logical Hardware Associated With HSL Loops* display.
  - g. Record the resource name on the display.
  - h. Move the cursor to the resource with the resource name you recorded in step 5g.
  - i. Select **Associated packaging resource(s)**.
  - j. Record the unit ID.
  - k. Return to the procedure that sent you here. **This ends the procedure.**

## RIOIP09

This procedure offers a description and service action for RIO/HSL/12X reference code B600 6982.

**Note:** A fiber-optic cleaning kit may be required for optical RIO/HSL/12X connections.

**Note:** This reference code can occur on an RIO/HSL/12X loop when an I/O expansion unit on the loop is powered off for a concurrent maintenance action.

1. Is the reference code in the Service Action Log (SAL) or serviceable event view you are using?  
**Yes:** There is a connection failure on an RIO/HSL/12X link. A B600 6984 reference code may also appear in the Product Activity Log (PAL) or error log view you are using. Both reference codes are reporting the same problem. Continue with the next step.  
**No:** The reference code is only informational, and requires no service action. **This ends the procedure.**
2. Multiple B600 6982 errors may occur due to retry and recovery activity. Is there a B600 6985 with "xxxx 3206" in word 4 logged after all B600 6982 errors for the same RIO/HSL/12X loop in the PAL?  
**Yes:** The recovery efforts were successful. Close all of the B600 6982 entries for the same loop in the SAL. No service is required. **This ends the procedure.**  
**No:** Continue with the next step.
3. Is there a B600 6987 reference code in the SAL, or serviceable event view you are using, logged at about the same time?  
**Yes:** Close this problem and work the B600 6987. **This ends the procedure.**  
**No:** Continue with the next step.
4. Is there a B600 6981 reference code in the SAL, or serviceable event view you are using, logged at approximately the same time?  
**Yes:** Go to step 9 on page 40.  
**No:** Continue with the next step.
5. Perform "RIOIP06" on page 37 to determine if this loop connects to any other systems and then return here.

**Note:** The loop number can be found in the SAL in the description for the HSL\_LNK FRU.

Is this loop connected to other systems?

**Yes:** Continue with the next step.

**No:** Go to step 9 on page 40.

6. Check for RIO/HSL/12X failures in the serviceable event views on the other systems. RIO/HSL/12X failures are indicated by entries with RIO/HSL/12X I/O bridge and Network Interface Controller (NIC) resources. Ignore B600 6982 and B600 6984 entries.

Are there RIO/HSL/12X failures on other systems?

**Yes:** Continue with the next step.

**No:** Go to step 9 on page 40.

7. Repair the problems on the other systems and return to this step. After making repairs on the other systems check the PAL of this system. Is there a B600 6985 reference code, with this loop's resource name, that was logged after the repairs you made on the other systems?

**Yes:** Continue with the next step.

**No:** Go to step 9 on page 40.

8. For the B600 6985 reference code you found, use "Status indications for RIO/HSL" on page 20 to determine if the loop is now complete.

Is the loop complete?

**Yes:** The problem has been resolved. Use "RIOIP01" on page 32 to verify that the loop is now working properly. **This ends the procedure.**

**No:** Continue with the next step.

9. The FRU list displayed in the SAL, or serviceable event view you are using, may be different from the failing item list given here. Use the FRU list in the serviceable event view if it is available.

Does the reference code appear in the serviceable event view with HSL\_LNK or HSLxxxx listed as a symbolic FRU?

**Yes:** Perform “RIOIP01” on page 32. **This ends the procedure.**

**No:** Exchange the FRUs in the serviceable event view according to their part action codes. **This ends the procedure.**

## RIOIP10

Use this procedure to determine if the RIO/HSL/12X loop is complete (with both primary and redundant paths functioning for each unit on the loop).

1. Is the system managed by a Hardware Management Console?

**Yes:** Continue with the next step

**No:** Go to step 3.

2. The RIO/HSL/12X loop number found in the first 4 characters of word 7 of the SRC that sent you here is in hexadecimal. Convert this number to decimal. If your loop number is greater than or equal to 0781 in hexadecimal format or 1921 in decimal format, then go to RIO/HSL/12X Topology screen, otherwise, go to View RIO Topology screen. Locate the decimal loop number’s information on the HMC. Are all links in this loop operational?

**Yes:** The RIO/HSL/12X loop recovered. Return to the procedure that sent you here. **This ends the procedure.**

**No:** The RIO/HSL/12X loop did not recover. Return to the procedure that sent you here. **This ends the procedure.**

3. Does the system have an i5/OS partition?

**Yes:** Go to step 6

**No:** Continue with the next step.

4. Search in Advanced System Management Interface (ASMI) for a B700 6985 informational SRC logged after the RIO/HSL/12X SRC you are working on. Did you find a B7000 6985 SRC?

**Yes:** Continue with the next step.

**No:** The status of the RIO/HSL/12X loop is unknown. Return to the procedure that sent you here. **This ends the procedure.**

5. Compare the first half of word 7 in the B700 6985 informational log to the value that caused you to be sent to this procedure. Are the two values the same?

**Yes:** The RIO/HSL/12X loop recovered. Return to the procedure that sent you here. **This ends the procedure.**

**No:** The status of the RIO/HSL/12X loop is unknown. Return to the procedure that sent you here. **This ends the procedure.**

6. Search for a B700 6985 SRC informational log (not in the serviceable event view) logged after the RIO/HSL/12X SRC you were working on. You can find informational logs in the i5/OS Product Activity Log. Compare the first half of word 7 in the B700 6985 informational log to the value that caused you to be sent to this procedure. Are the two values the same?

**Yes:** Use the informational log and “Status indications for RIO/HSL” on page 20 to determine if the loop has recovered. This ends the procedure.

**No:** Continue with the next step.

7. Is this system in an RIO/HSL/12X loop with other systems, where any of the systems on the loop is running i5/OS Opticonnect?

**No:** The loop did not recover. Return to the procedure that sent you here. This ends the procedure.

**Yes:** Continue with the next step.

8. Use the Hardware Service Manager (HSM) in i5/OS to examine the RIO/HSL/12X loop number that caused you to be sent to this procedure.
  - a. Use SST (on an i5/OS partition in the system with the error) to start the HSM and display the logical resources for HSL loops.
  - b. Convert the hexadecimal RIO/HSL/12X loop number to decimal. Locate the decimal loop number in the HSM display and determine the status of the loop number. Is "Operational" the status of the loop number?
 

**No:** The loop did not recover. Return to the procedure that sent you here. This ends the procedure.

**Yes:** The loop has recovered. This ends the procedure.

## RIOIP11

Use this procedure to recover from a B7xx 6982 RIO/HSL/12X failure.

1. Record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 40.
2. Did the RIO/HSL/12X loop recover?
 

**No:** Continue with the next step

**Yes:** Close the problem. **This ends the procedure.**
3. Work with the customer to determine if a processor enclosure or I/O enclosure on the RIO/HSL/12X loop has powered down normally.
4. Was a processor enclosure or I/O enclosure on the loop powered down normally?
 

**No:** Go to 6.

**Yes:** The loop remains in a failed state until all processor enclosures and I/O enclosures on the loop are powered on and functioning. Work with the customer to determine if all the powered down enclosures on the loop can be powered on. After all enclosures on the loop are powered on, continue with the next step.
5. Did the RIO/HSL/12X loop recover?
 

**No:** Continue with the next step.

**Yes:** Close the problem. **This ends the procedure.**
6. Search for a serviceable event with a 1xxx xxxx SRC logged at approximately the same time and with one or more FRUs in the same unit as those in the FRU list for the SRC you are currently working.
7. Did you find a serviceable event with a 1xxx xxxx SRC?
 

**No:** Go to 9

**Yes:** Work to resolve the problem. After you have repaired that error, the RIO/HSL/12X loop may be recovered. After you finish working on the problem, return to this procedure and check to determine if correcting that problem also corrected the RIO/HSL/12X error. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 40.
8. Did the RIO/HSL/12X loop recover?
 

**No:** Continue with the next step.

**Yes:** Close the problem. **This ends the procedure.**
9. In the serviceable event view, search for a B700 6981 error logged at approximately the same time and on the same RIO/HSL/12X loop (the first four characters of word 7 are the same).
10. Did you find a serviceable event with a B700 6981 SRC at approximately the same time and on the same RIO/HSL/12X loop?
 

**No:** Go to 12 on page 42.

**Yes:** Work to resolve the problem. After you have repaired that error, the RIO/HSL/12X loop may be recovered. After you finish working on the problem, return to this procedure and check to determine if correcting that problem also corrected the RIO/HSL/12X error. To determine if

the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 40.

11. Did the RIO/HSL/12X loop recover?

**No:** Continue with the next step.

**Yes:** Close the problem. **This ends the procedure.**

12. Using the FRU list that you are working with for this SRC, exchange one FRU at a time. After you exchange each FRU, determine if the loop has recovered. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 40. After the loop recovers or after you have exchanged all the FRUs, continue with the next step. To replace a FRU, refer to System FRU locations.

13. Did the RIO/HSL/12X loop recover?

**No:** Contact your next level of support. **This ends the procedure.**

**Yes:** Close the problem. **This ends the procedure.**

## RIOIP12

Use this procedure to recover from a B7xx 6985 RIO/HSL/12X failure.

1. Work with the customer to determine if a processor enclosure or I/O enclosure on the RIO loop has powered down normally.

2. Was a processor enclosure or I/O enclosure on the loop powered down normally?

**No:** Go to 4.

**Yes:** The loop remains in a failed state until all processor enclosures and I/O enclosures on the loop are powered on and functioning. Work with the customer to determine if all the powered down enclosures on the loop can be powered on. After all processor enclosures and I/O enclosures on the loop are powered on, check to determine if the RIO/HSL/12X loop is complete. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 40.

3. Did the RIO/HSL/12X loop recover?

**No:** Continue with the next step.

**Yes:** Close the problem. **This ends the procedure.**

4. In the serviceable event view, search for a serviceable event with a 1xxx xxxx SRC logged at approximately the same time and with one or more FRUs in the same enclosure as those in the FRU list for the SRC you were currently working with.

5. Did you find a serviceable event with a 1xxx xxxx SRC?

**No:** Go to 7

**Yes:** Work to resolve the problem. After you have repaired that error, the RIO/HSL/12X loop may be recovered. After you finish working on the problem, return to this procedure and check to determine if correcting that problem also corrected the RIO/HSL/12X error. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 40.

6. Did the RIO/HSL/12X loop recover?

**No:** Continue with the next step.

**Yes:** Close the problem. **This ends the procedure.**

7. In the serviceable event view, search for a B700 6981 or B700 6986 error logged at approximately the same time and on the same RIO/HSL/12X loop (the first four characters of word 7 are the same).

8. Did you find a B700 6981 or a B700 6986 error logged at approximately the same time and on the same RIO/HSL/12X loop?

**No:** Go to step 10 on page 43.

**Yes:** Work to resolve the problem. After you have repaired that error, the RIO/HSL/12X loop may be recovered. After you finish working on the problem, return to this procedure and check

to determine if correcting that problem also corrected the RIO/HSL/12X error. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 40.

9. Did the RIO/HSL/12X loop recover?

**No:** Continue with the next step.

**Yes:** Close the problem. **This ends the procedure.**

10. Search for a processor enclosure or I/O enclosure on the RIO/HSL/12X loop that has not powered up as expected.

11. Did you find a processor enclosure or I/O enclosure on the RIO/HSL/12X loop that has not powered up as expected?

**No:** Go to 13.

**Yes:** Go to "Cannot power on SPCN-controlled I/O expansion unit" on page 145 and work that power symptom. Use the first half of word 7 to determine the loop number for later use. After you have repaired that error, the RIO/HSL/12X loop may be recovered. After you finish working that power symptom, return to this procedure and check to determine if correcting that problem also corrected the RIO/HSL/12X error. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 40.

12. Did the RIO/HSL/12X loop recover?

**No:** Continue with the next step.

**Yes:** Close the problem. **This ends the procedure.**

13. Using the FRU list that you are working with for this SRC, exchange one FRU at a time. After you exchange each FRU, determine if the loop has recovered. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 40. After the loop recovers or after you have exchanged all the FRUs, continue with the next step. To replace a FRU, refer to System FRU locations.

14. Did the RIO/HSL/12X loop recover?

**No:** Contact your next level of support. **This ends the procedure.**

**Yes:** Close the problem. **This ends the procedure.**

## RIOIP56

Use this procedure to restore the RIO 12X link to optimal bandwidth.

1. Record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC. The loop number is in hexadecimal format and must be converted to decimal.

2. Is the system managed by a Hardware Management Console?

**Yes:** Continue with the next step.

**No:** Go to step 6 on page 44.

3. Perform the following from the Hardware Management Console:

- a. Select the system you are working on.
- b. Navigate to **Hardware (information)** and expand it.
- c. Select **View RIO -12X Topology**.
- d. In the current topology area, scroll until you find the data for the RIO/HSL/12X decimal loop number you identified in step 1.

Is the link width 12X?

**Yes:** The RIO 12X cable connection is now operating at the optimal bandwidth. No further action is required. **This ends the procedure.**

**No:** Continue with the next step.

- Unplug both ends of the cable indicated in the FRU list for at least 30 seconds and then reconnect it. Refresh the **View RIO-12X Topology** view on the Hardware Management Console and verify that the width is now 12X for the decimal loop number you identified in step 1.

Is the link width 12X?

**Yes:** The RIO 12X cable connection is now operating at the optimal bandwidth. No further action is required. **This ends the procedure.**

**No:** Continue with the next step.

- Replace the cable. Refresh the *View RIO-12X Topology* view on the Hardware Management Console and verify that the width is now 12X for the decimal loop number you identified in step 1.

Is the link width 12X?

**Yes:** The RIO 12X cable connection is now operating at the optimal bandwidth. No further action is required. **This ends the procedure.**

**No:** Continue replacing the items in the FRU list until the problem is resolved. **This ends the procedure.**

- Unplug both ends of the cable indicated in the FRU list for at least 30 seconds and then reconnect the cable. It is not possible to concurrently verify that the RIO 12X link has been restored to optimal bandwidth. If the same SRC occurs for this RIO 12X link after the next IPL, the problem has not been resolved. Replace the cable and check for the error condition after the next IPL. Continue replacing the items in the FRU list, and perform an IPL the system each time until the problem has been resolved. **This ends the procedure.**

---

## Multi-adapter bridge isolation procedures

Use multi-adapter bridge (MAB) isolation procedures if there is no HMC attached to the server. If the server is connected to the HMC, use the procedures that are available on the HMC to continue FRU isolation.

### MABIP02

Use this procedure to resolve a problem with a multi-adapter bridge.

Perform "MABIP51" on page 46.

### MABIP03

Use this procedure to isolate a failing PCI adapter under a multi-adapter bridge.

Perform "MABIP50" on page 45.

### MABIP05

Use this procedure to reset an IOP.

**Attention:** When the IOP reset is performed, all resources controlled by the IOP will be reset. Perform this procedure only if the customer has verified that the IOP reset can be performed at this time.

- Go to the SST/DST display in the partition which reported the problem. Use STRSST if IBM i is running; use function 21 if STRSST does not work; or IPL the partition to DST.
- On the Start Service Tools Sign On display, type in a user ID with service authority and password.
- Select **Start a service tool** → **Hardware service manager** → **Logical hardware resources** → **System bus resources**.
- Page forward until you find the IOP that you want to reset. For help in identifying the IOP from the Direct Select Address (DSA) in the reference code, see "DSA translation" on page 6.
- Verify that the IOP are correct by matching the resource name(s) on the display with the resource name(s) in the Service Action Log (SAL) for the problem you are working on.

6. Move the cursor to the IOP that you want to reset, and select **I/O Debug → Reset IOP → IPL IOP**. **This ends the procedure.**

## MABIP50

Use this procedure to isolate a failing PCI I/O adapter under a multi-adapter bridge.

This procedure iterates through any IOPs under the multi-adapter bridge and any PCI cards operating without an IOP. It powers off each one, and then resets the multi-adapter bridge. This process repeats until it isolates the failing part.

1. **Is the failing item located in an 8203-E4A, 9407-M15, 9408-M25, 8204-E8A, 9409-M50, 8234-EMA, 9117-MMA, 9406-MMA, 9125-F2A, or 5796 expansion unit?**  
**No:** Continue with the next step.  
**Yes:** Continue with the next failing item in the failing item list. **This ends the procedure.**
2. **Is the failing item located in a 5797 or 5798 expansion unit and is the location code of the other failing items in the failing item list Un-P1-C4 through Un-P1-C10, or Un-P2-C4 through Un-P2-C10?**  
**No:** Continue with the next step.  
**Yes:** Continue with the next failing item in the failing item list. **This ends the procedure.**
3. **Is the partition an AIX partition or a Linux partition, or is an HMC attached?**  
**No:** Continue with the next step.  
**Yes:** Go to “PCI bus isolation using AIX, Linux, or the HMC” on page 2 to isolate a PCI bus problem from AIX, Linux, or the HMC.
4. **Does the partition IPL to DST?**  
**No:** Perform “MABIP52” on page 47. **This ends the procedure.**  
**Yes:** Go to the SST/DST display in the partition that reported the problem. If i5/OS is running, use STRSST; if STRSST does not work, use function 21. If i5/OS is not running, IPL the partition to DST. Then, continue with the next step.
5. On the Start Service Tools Sign On display, type in a user ID with QSRV authority and password.
6. Select **Start a service tool → Hardware service manager → Logical hardware resources → System bus resources**.
7. Page forward until you find the multi-adapter bridge where the problem was reported. For help in identifying the multi-adapter bridge from the Direct Select Address (DSA) in the reference code, see “DSA translation” on page 6. Verify that the multi-adapter bridge is the correct one by matching the resource name on the display with the resource name in the Service Action Log (SAL) for the problem that you are working on.
8. Select **Include non-reporting resources**.
9. Move the cursor to the first IOP under the multi-adapter bridge.
10. If the IOP is virtual, go to step 14. Otherwise, for each IOP that is under the multi-adapter bridge that you are working on, select **Associated packaging resource(s) → Display detail**.
11. Record the location of the IOP, except for virtual IOPs.
12. Select **Cancel → Cancel**.
13. Select **Resources associated with IOP**.
14. For each I/O adapter under the IOP, perform the following:
  - a. Select **Associated packaging resource(s) → Display detail**.
  - b. Record the location.

**Note:** There will be one IOA resource under each virtual IOP.

15. Perform the following:
  - a. Power off the frame or tower. See Powering on and powering off the system .
  - b. Remove one of the IOPs and all of its IOAs, or the one IOA resource under a virtual IOP.
  - c. Power on the frame or tower. Continue with the next step.
16. Check for the same failure that brought you to this procedure. Check the system control panel, the SAL for the partition that reported the problem, or the Work with partition status display for the partition that reported the problem.
17. **Did the same reference code appear?**

**No:** Go to step 20.

**Yes:** Power on the frame or tower. Then continue with the next step.
18. Return to the System bus resources display showing the multi-adapter bridge and the associated resources.
19. **Is there another IOP under the multi-adapter bridge?**

**No:** Go to step 22.

**Yes:** Return to step 15.
20. If the IOP is virtual, then replace the IOA. **This ends the procedure.** Otherwise, the failing item is either the IOP or one of the I/O adapters that it controls. Reinstall the IOP and I/O adapters that you just removed. Perform “MABIP55” on page 53. If this procedure does not help you to identify a failing I/O adapter, then return here and continue with the next step in this procedure.
21. Perform the following:
  - a. Exchange the IOP that you identified in step 15.
  - b. **Power on the frame or tower. Does the same reference code that sent you to this procedure occur?**

**No:** The failing item was the IOP that you just exchanged. Reinstall all of the other IOPs and I/O adapters that you removed during this procedure. Go to Verify a repair. **This ends the procedure .**

**Yes:** Continue with the next step.
22. The failing item is the FRU containing the multi-adapter bridge which controls this IOP, or an IOA that is not under an IOP. Perform the following:
  - a. Power off the unit that you are working on.
  - b. Exchange the FRU containing the multi-adapter bridge.
  - c. Power on the unit that you are working on.
  - d. **Does the same reference code that sent you to this procedure occur?**

**No:** The failing item was the multi-adapter bridge FRU that you just exchanged. Reinstall all of the other IOPs and I/O adapters that you removed during this procedure. Go to Verify a repair. **This ends the procedure .**

**Yes:** Contact your next level of support. **This ends the procedure.**

## MABIP51

Use this procedure to resolve a problem with a multi-adapter bridge.

This procedure will determine if the multi-adapter bridge is failing when the symbolic FRU PIOCARD is in the failing item list. It will also determine if the symbolic FRU PIOCARD can be removed from the FRU list.

1. **Is the failing item located in an 8203-E4A, 9407-M15, 9408-M25, 8204-E8A, 9409-M50, 8234-EMA, 9117-MMA, 9406-MMA, 9125-F2A, or a 5796 expansion unit?**

**No:** Continue with the next step.

**Yes:** Continue with the next failing item in the failing item list. **This ends the procedure.**

2. **Is the failing item located in a 5797 or 5798 expansion unit and is the location code of the other failing items in the failing item list Un-P1-C4 through Un-P1-C10, or Un-P2-C4 through Un-P2-C10?**

**No:** Continue with the next step.

**Yes:** Continue with the next failing item in the failing item list. **This ends the procedure.**

3. **Is the partition an AIX partition or a Linux partition, or is an HMC attached?**

**No:** Continue with the next step.

**Yes:** Go to "PCI bus isolation using AIX, Linux, or the HMC" on page 2 to isolate a PCI bus problem from AIX, Linux, or the HMC.

Use the Service Action Log (SAL) to check for other errors under the same multi-adapter bridge using the following steps:

1. **Were you able to obtain a location for the PIOCARD FRU from the SAL?**

**No:** Find the reference code in the SAL and record the Direct Select Address (DSA), which is in word 7. See "DSA translation" on page 6, then continue with the next step.

**Yes:** Go to step 6.

2. Record the bus number (BBBB) and the multi-adapter bridge number (C) of the DSA.
3. Go to isolation procedure "MABIP53" on page 48 and determine the location of the PCI I/O card in the failing item list. Then return here and continue with the next step.
4. Determine which of the card positions are controlled by the same multi-adapter bridge that is controlling the PCI I/O card. (Use the card position table for the frame or I/O tower type you recorded in MABIP53.)

**Note:** A card position is controlled by the same multi-adapter bridge if it has the same bus number and multi-adapter bridge number as the PCI I/O Card that you previously located.

5. Record the card position and the DSA from the card position table for each card position that is controlled by the same multi-adapter bridge.
6. Look in the SAL. See Using the Service Action Log for other failures in the same frame that are either located in the card positions that you recorded in step 4 or are listed with the PIOCARD FRU.
7. **Are any such failures listed in the SAL?**

**No:** Use the failing item list that you were using when you started this procedure. **This ends the procedure.**

**Yes:** The multi-adapter bridge is failing. Remove symbolic FRU PIOCARD from the list of failing items, as it is not the failing FRU. **This ends the procedure.**

## MABIP52

This procedure will isolate a failing PCI adapter from a reference code when an IPL is not successful on the system or logical partition.

**Attention:** The removal and replacement procedure of all FRUs in this procedure are performed using dedicated maintenance (partition powered off). If not, the problem cannot be fixed.

1. Determine the PCI bridge set (multi-adapter bridge domain) by performing the following:
  - a. Record the bus number (BBBB), the multi-adapter bridge number (C) and the multi-adapter bridge function number (c) from the Direct Select Address (DSA) in word 7 of the reference code. See "DSA translation" on page 6 for help in determining these values.
  - b. Use the bus number that you recorded and the System Configuration Listing (or ask the customer) to determine what frame the bus is in.
  - c. Record the frame type where the bus is located.

- d. Use the System Configuration Listing, the card position table for the frame type that you recorded, the bus number, and the multi-adapter bridge number to determine the PCI bridge set where the failure occurred. The PCI bridge set is the group of card positions controlled by the same multi-adapter bridge on the bus that you recorded.
  - e. Use the card position table to record the PCI bridge set card positions.
  - f. Examine the PCI bridge set in the frame, and record all the positions with IOA cards installed in them.
2. Perform the following:
- a. Power off the partition.
  - b. Remove all the IOA cards in the PCI bridge set identified in step 1. Be sure to record the card position of each IOA so that you can reinstall it in the same position later. To determine the location of all the IOA cards in the PCI bridge set, go to System FRU locations.
  - c. Power on the partition.
- Does the reference code or failure that sent you to this procedure occur?
- No:** Continue with the next step.
- Yes:** The problem is the multi-adapter bridge. Continue with step “MABIP52” on page 47.
3. Reinstall one of the IOAs and power on the partition. Does the reference code or failure that sent you to this procedure occur?
- Yes:** The IOA that you just installed is the failing FRU. Replace the IOA. **This ends the procedure.**
- No:**
- If a different SRC occurs, return to Start of Call and follow the service procedures for the new reference code. **This ends the procedure.**
  - If no SRC occurs and there are more IOAs to install, power off the partition and repeat this step.
  - If no SRC occurs and there are no more IOAs to install, the problem is intermittent; contact your next level of support. **This ends the procedure.**
4. Power off the partition. Determine which FRU contains the multi-adapter bridge. Locate the card position table for the frame type that you recorded. Perform the following:
- a. Using the multi-adapter bridge number that you recorded, search for the multi-adapter bridge function number “F” in the card position table to determine the card position of the multi-adapter bridge’s FRU.
  - b. Exchange the multi-adapter bridge’s FRU at the card position that you determined for it. See System FRU locations to determine the correct card location for removal.
  - c. Install all IOAs in their original positions.
  - d. Power on the partition.
- Does the reference code or failure that sent you to this procedure occur?
- No:** Go to Verify a repair. **This ends the procedure.**
- Yes:** Call your next level of support. **This ends the procedure.**

## MABIP53

Use this procedure to determine a card position when no location is given for a PCI adapter FRU.

This procedure uses the Direct Select Address given in the reference code because no location was given for a PCI adapter FRU.

1. Is the partition an AIX partition or a Linux partition, or is an HMC attached?
- No:** Continue with the next step.

- Yes:** Go to “PCI bus isolation using AIX, Linux, or the HMC” on page 2 to isolate a PCI bus problem from AIX, Linux, or the HMC.
2. If you were sent to this procedure with a specific Direct Select Address (DSA), then use it. Otherwise, use the DSA in the reference code. Refer to “DSA translation” on page 6 to find the DSA in the reference code and translate it into the BBBB Cc values that you use in later steps of this procedure.
  3. Perform the following:
    - a. Record the bus number value, BBBB, in the DSA and convert it to decimal format.
    - b. Search for the decimal bus number in HSM or the System Configuration Listing to determine which frame or I/O unit contains the failing item. From the HSM screen select **Logical Hardware Resources > System Bus resources**. Move the cursor to a system bus object and select **Display Detail**. Do this for each bus until you find the bus on which you are working.
    - c. Record the frame or unit type.
  4. Record the Cc value in the DSA. Is the Cc value greater than 00?
 

**No:** The multi-adapter bridge and the multi-adapter function number are not identified. Record that the multi-adapter bridge is not identified in the DSA. The card slot cannot be identified using the DSA. Go to step 9.

**Yes:** Continue with the next step.
  5. Is the right-most character of the Cc value ‘F’?
 

**No:** Continue with the next step.

**Yes:** Only the multi-adapter bridge number is identified. Record the multi-adapter bridge number (the leftmost character of the Cc value) for later use. The card slot cannot be identified using the DSA. Go to step 9.
  6. Are you working with a B7xx reference code?
 

**No:** Go to step 8.

**Yes:** Continue with the next step.
  7. Is SST/DST available?
 

**No:** Continue with the next step.

**Yes:** Go to step 13 on page 50.
  8. Use the “Card positions” on page 7 with the BBBB and Cc values that you recorded to identify the card position. Then return to the procedure, failing item, or symbolic FRU that sent you here. This ends the procedure.
  9. Perform the following:
    - a. Sign onto SST or DST if you have not already done so.
    - b. Select **Start a service tool > Hardware service manager > Logical Hardware Resources > System bus resources**.
    - c. Put the bus number in the System bus(es) to work with field. Then select Include non-reporting resources and examine the display. Is there more than one multi-adapter bridge connected to the bus resource you are working with?
 

**No:** Continue with the next step.

**Yes:** Go to step 12 on page 50.
  10. Was there a multi-adapter bridge number identified in the Cc value of the DSA?
 

**Yes:** Continue with the next step.

**No:** From the Logical Hardware Resources on System Bus display, examine the status of all the resources under the bus, looking for a “failed” resource.

    - To examine the status of the IOAs, select **Resources associated with IOP** for each IOP under the bus.
    - To determine the card position of a failed resource, select **Associated packaging resource(s) > Display detail** and record the unit ID and part number.

Return to the procedure that sent you here. **This ends the procedure.**

11. Search for the multi-adapter bridge number that is identified in the DSA by moving the cursor to each multi-adapter bridge resource and selecting **Display detail**. Convert the *system card* value to hexadecimal (it is displayed in decimal format). The hexadecimal *system card* value is the Cc address of the multi-adapter bridge. When you find the multi-adapter bridge resource, where the multi-adapter bridge number (the leftmost character of the hexadecimal Cc value) matches the multi-adapter bridge number that you recorded from the DSA, then you have located the multi-adapter bridge identified in the DSA.
12. From the Logical Hardware Resources on System Bus display, examine the status of all the resources under the multi-adapter bridge, looking for a "failed" resource.
  - To examine the status of the IOAs, select **Resources associated with IOP** for each IOP under the multi-adapter bridge.
  - To determine the card position of a failed resource, select **Associated packaging resource(s) > Display detail** and record the unit ID and part number.

Did you find any failed resources?

**Yes:** One of the failing resources that you located is the problem. Return to the procedure that sent you here. **This ends the procedure.**

**No:** Use the System Configuration Listing and "Card positions" on page 7 for the frame type that you recorded to determine which card positions may have the failing card. If you recorded that the multi-adapter bridge was identified in the leftmost character of the Cc value, then "Card positions" on page 7 will help you identify which card slots (PCI bridge set) are controlled by the multi-adapter bridge that is identified in the Cc value. If the multi-adapter bridge was not identified in the Cc value (indicated by a value of '0' in the leftmost character) then "Card positions" on page 7 will identify which card slots are controlled by the bus (BBBB) that is identified in the DSA. Return to the procedure that sent you here. **This ends the procedure.**

13. Perform the following:
  - a. Convert the hexadecimal Cc value in the DSA into a decimal value. You will be searching for the decimal value in HSM where it will be called "*System card*".
  - b. Sign on to SST or DST if you have not already done so.
  - c. Select **Start a Service Tool > Hardware Service Manager > Logical Hardware Resources > System Bus Resources**.
  - d. Search for the "System Bus" resource identified in BBBB of the DSA by moving the cursor to each system bus resource and selecting **Display detail**. Do this until you locate the bus number that matches the decimal bus number value that you recorded from the DSA. Record the resource name of the bus for later use. From the Logical Hardware Resources on System Bus display, select **Include non-reporting resources**.
14. From the Logical Hardware Resources on System Bus display, examine all of the IOP and IOA resources under the bus. Look for a "*System card*" value that matches the decimal value of the Cc that you converted to decimal in step 12. Perform the following to display the "*System card*" value for each of the IOP and IOA resources:

**Note:** Do not examine virtual IOP resources.

  - To examine the IOP resources:
    - a. Select **Associated packaging resource(s) > Display detail**. The "*System card*" value of the IOP will be shown on the display.
    - b. If the "*System card*" value matches the decimal value of the Cc, then you have located the failing resource. Record the unit ID and part number, and then return to the procedure that sent you here. Otherwise, continue to examine all the IOP and IOA resources on the bus.
  - To examine the IOA resources:
    - a. Move the cursor to an IOP or a virtual IOP resource and select **Resources associated with IOP > Associated packaging resource(s) > Display detail**. The "*System card*" value of the IOA will be shown on the display.

- b. If the "System card" value matches the decimal value of the Cc, then you have located the failing resource. Record the unit ID and part number, and then return to the procedure that sent you here. Otherwise, continue to examine all the IOP and IOA resources on the bus.

Have you examined all the IOP and IOA resources under the bus?

**No:** Repeat this step.

**Yes:** Continue with the next step.

15. Did you locate a resource with a "System card" value that matches the decimal Cc value from step 13 on page 50?

**Yes:** Record the unit ID and part number of the resource. Return to the procedure that sent you here. This ends the procedure.

**No:** You will not be able to locate the card using DST. Go to step 8 on page 49 to locate the card.

## MABIP54

Use this procedure to isolate the failing PCI I/O adapter card from a reference code with a Direct Select Address when the serviceable event view does not indicate a location for the PCI card.

The removal and replacement of all FRUs in this procedure must be performed using dedicated maintenance.

1. Is the partition an AIX partition or a Linux partition, or is an HMC attached?

**No:** Continue with the next step.

**Yes:** Go to "PCI bus isolation using AIX, Linux, or the HMC" on page 2 to isolate a PCI bus problem from AIX, Linux, or the HMC.

2. Determine the PCI bridge set (multi-adapter bridge domain) by performing the following:

- a. Record the bus number (BBBB), the multi-adapter bridge number (C), and the multi-adapter bridge function number (c) from the Direct Select Address (DSA) (see "Analyzing a RIO/HSL/12X or PCI bus reference code" on page 5 for help in determining these values).

- b. Using the bus number and the System Configuration Listing, or by asking the customer, determine which unit the bus is located in and record that unit type.

- c. The PCI bridge set is the group of card positions controlled by the same multi-adapter bridge on the bus that you recorded. Use the System Configuration Listing, the "Card positions" on page 7 table for the unit type that you recorded, the bus number, and the multi-adapter bridge number to determine in which PCI bridge set the failure occurred.

- d. Using the card position table, record the PCI bridge set card positions, and the multi-adapter bridge function numbers.

- e. Examine the PCI bridge set and record the information on the form for all of the positions with IOP and IOA cards installed in them.

3. Perform the following:

- a. Power off the system or partition.

- b. Remove all the IOAs in the PCI bridge set identified in step 1. Be sure to record the card position of each IOA so that you can reinstall it in the same position later. To determine the remove and replace procedures for the IOAs, locate the IOA card positions in System FRU locations for the frame type that you recorded.

- c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**No:** Power off the system or partition. Go to step 7 on page 52.

**Yes:** Continue with the next step.

4. Perform the following:

- a. Power off the system or partition.

- b. Exchange the IOP that is indicated in the DSA. Be sure to record the card position of the IOP so that you can reinstall it in the same position later. To determine the exchange procedure for the IOP, locate the IOP's card position in System FRU locations for the frame type you recorded.
- c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**No:** Power off the system or partition. Go to step 11 on page 53.

**Yes:** Continue with the next step.

5. Perform the following:
  - a. Power off the system or partition.
  - b. Install all of the IOAs that you removed in step 2. Be sure to install them in their original positions.
  - c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**No:** Perform "Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair" on page 3. **This ends the procedure.**

**Yes:** Continue with the next step.

6. Perform the following:
  - a. Power off the system or partition.
  - b. Remove all of the IOAs in the PCI bridge set identified in step 1. Be sure to record the card position of each IOA so that you can reinstall it in the same position later.
  - c. Remove the IOP that you exchanged and install the original IOP in its original position. Continue with the next step.
7. Perform the following:
  - a. Reinstall, in its original position, one of the IOAs that you removed.
  - b. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**No:** Power off the system or partition. Repeat this step for another one of the IOAs that you removed. If you have reconnected all of the IOAs and the reference code or failure that sent you to this procedure does not occur, the problem is intermittent; contact your next level of support. **This ends the procedure.**

**Yes:** The IOA that you just installed is the failing FRU. Continue with the next step.

8. Perform the following:
  - a. Power off the system or partition.
  - b. Replace the I/O adapter card that you last installed. Be sure to install the new I/O adapter card in the same position.
  - c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**Yes:** Contact your next level of support. **This ends the procedure.**

**No:** Continue with the next step.

9. Perform the following:
  - a. Power off the system or partition.
  - b. Reinstall, in their original positions, the remaining I/O adapter cards that you removed.
  - c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**Yes:** Contact your next level of support. **This ends the procedure.**

**No:** Continue with the next step.

10. Does a different reference code occur?  
**Yes:** Perform Problem Analysis for the new reference code.  
**No:** Perform “Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair” on page 3. **This ends the procedure.**
11. The problem is the multi-adapter bridge. Perform the following:
- Power off the system or partition.
  - If you have not already done so, replace the I/O backplane in the failing enclosure.
  - Install the original IOP in its original position.
  - Install all of the other IOPs and IOAs into their original positions. Do not install the IOAs that you were instructed to remove in step 3 on page 51.
  - Power on the system or partition.
- Does the reference code or failure that sent you to this procedure occur?  
**Yes:** Contact your next level of support. **This ends the procedure.**  
**No:** Continue with the next step.
12. Perform the following:
- Power off the system or partition.
  - Install all of the IOAs that you removed in step 3 on page 51. Be sure to install them in their original positions.
  - Power on the system or partition.
- Does the reference code or failure that sent you to this procedure occur?  
**Yes:** Contact your next level of support. **This ends the procedure.**  
**No:** The problem has been resolved. **This ends the procedure.**

## MABIP55

Use this procedure to isolate a failing I/O adapter.

**Attention:** Go to “PCI bus isolation using AIX, Linux, or the HMC” on page 2 to isolate a PCI bus problem from AIX, Linux, or the HMC.

- If the system is not IPLed, will it IPL to DST?  
**No:** Perform “MABIP54” on page 51. **This ends the procedure.**  
**Yes:** From the SAL display for the reference code, record the count. Continue with the next step.
- Go to the SST/DST display in the partition which reported the problem. Use STRSST if i5/OS is running; use function 21 if STRSST does not work; or IPL the partition to DST.
- On the Start Service Tools Sign On display, type in a user ID with QSRV authority and password.
- Select **Start a service tool > Hardware service manager > Logical hardware resources > System bus resources.**
- Is there a resource name logged in the SAL entry?  
**No:** Continue with the next step.  
**Yes:** Go to step 12 on page 54
- Do you have a location for the I/O processor?  
**No:** Record the Direct Select Address (DSA), word 7 of the reference code, from the SAL display. Then continue with the next step.  
**Yes:** Go to step 10 on page 54
- Return to the HSM System bus resources display.
- Locate the I/O processor by performing the following:

- a. Select **Display detail**.
- b. Compare the DSA with the bus, card, and board information for the IOP.

**Note:** The card information on the HSM display is in decimal format. You must convert the decimal card information to hexadecimal format to match the DSA format.

- c. Repeat this step until you find the IOP with the same DSA.
9. Select Cancel, and then go to step 13.
10. Locate the I/O processor in HSM by performing the following for each IOP:
  - a. Select **Associated packaging resource(s) > Display detail**.
  - b. Repeat until you find the IOP with the same location.
11. Select Cancel > Cancel and go to step 13.
12. Page forward until you find the multi-adapter bridge and IOP where the problem exists. Verify that the multi-adapter bridge and IOP are correct by matching the resource name(s) on the display with the resource name(s) in the SAL for the problem you are working on.
13. For the IOP you are working on, select **Resources associated with IOP** (if the I/O adapters are not already displayed).
14. If there is an IOA that is listed in any state other than *"operational"*, then perform steps 15 through 18 on page 55, starting with the disabled IOA by moving the cursor to the disabled IOA. Otherwise, move the cursor to the first IOA that is assigned to the IOP.
15. Select **Associated packaging resource(s) > Concurrent maintenance > Power off domain**. Record the unit ID of the slot you are powering off. Did the domain power off successfully?

**No:** Choose from the following options:

- If only one IOA was listed as failing, power down the system and replace the IOA. Re-IPL the system. If a different reference code occurred, perform problem analysis and work that reference code. If there was no reference code, go to Verify a repair. **This ends the procedure.**
- If there were multiple failed IOAs and concurrent maintenance did not work on one, then move to the next failed IOA and repeat steps 15 through 18 on page 55.
- If concurrent maintenance does not work for multiple failed IOAs, this procedure will not be able to identify a failing I/O adapter. Return to the procedure that sent you here. **This ends the procedure.**

**Yes** Perform "MABIP05" on page 44 and then return here and continue with the next step.

16. Did the IOP reset and IPL successfully?

**No:** This procedure will not be able to identify a failing I/O adapter. Return to the procedure that sent you here. **This ends the procedure.**

**Yes:** Check for the same failure that sent you to this procedure. Check the system control panel, the SAL for the partition that reported the problem, or the Work with partition status display for the partition that reported the problem. In the SAL, the count will increase if the reference code occurred again. Continue with the next step.

17. Did the same reference code occur after the IOP was reset and IPL'd?

**No:** Go to step 19 on page 55.

**Yes:** Perform the following:

- a. Go to the Hardware Service Manager display.
- b. Go to Packaging Hardware Resources.
- c. Power on the IOA by selecting Power on domain.
- d. Reassign the IOA to the IOP
- e. Return to the HSL resource display, showing the IOP and associated resources.

- f. Continue with the next step.
18. Is there any other IOA, assigned to the IOP, that you have not already powered off and on?
- No:** Go to step 21.
- Yes:** Move the cursor to another IOA assigned to the IOP, choosing IOAs with a status of "*unknown*" or "*disabled*" before moving on to IOAs with a status of "operational". Go to step 15 on page 54.
19. The failing IOA is located. Exchange the I/O adapter that you just powered off. Use the location you recorded in step 15 on page 54 to locate the IOA.
20. Power on the IOA that you just exchanged. Does the same reference code that sent you to this procedure still occur?
- No:** You have exchanged the failing IOA. Go to Verify a repair. **This ends the procedure.**
- Yes:** The IOA is not the failing item. Remove the IOA and reinstall the original IOA. Continue with the next step.
21. No failing IOAs were identified. Return to the procedure that sent you here. **This ends the procedure.**

---

## Communication isolation procedure

Isolate a communications failure.

Read and observe the following warnings when using this procedure.

### DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

## COMIP01, COMPIP1

This procedure helps you to isolate problems with the communications input/output adapter (IOA) or input/output processor (IOP).

Please read and observe the danger notices in “Communication isolation procedure” before proceeding with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions.

2. To determine which communications hardware to test, use the SRC from the problem summary form, or problem log, For details on line description information, see the Starting a Trace section of Work with communications trace.
3. Perform the following:
  - a. Vary off the resources.
  - b. On the Start a Service Tool display, select **Hardware service manager** → **Logical hardware resources** → **System bus resources** → **Resources associated with IOP** for the attached IOPs in the list until you display the suspected failing hardware.
  - c. Select **Verify** on the hardware you want to test. The **Verify** option may be valid on the IOP, IOA, or port resource. When it is valid on the IOP resource, any replaceable memory will be tested. Communications IOAs are tested by using the **Verify** option on the port resource.
4. Run the IOA/IOP test(s). This may include any of the following:

- Adapter internal test
- Adapter wrap test (requires adapter wrap plug - available from your hardware service provider).
- Processor internal test
- Memory test
- System port test

Does the IOA/IOP test(s) complete successfully?

**No:** The problem is in the IOA or IOP. If a verify test identified a failing memory module, replace the memory module. On multiple card combinations, exchange the IOA card before exchanging the IOP card. Exchange the failing hardware. See System FRU locations. **This ends the procedure.**

**Yes:** The IOA/IOP is good. Do NOT replace the IOA/IOP. Continue with the next step.

5. Before running tests on modems or network equipment, the remaining local hardware should be verified Since the IOA/IOP test(s) have completed successfully, the remaining local hardware to be tested is the external cable.

Is the IOA adapter type 2838, with a UTP (unshielded twisted pair) external cable?

**Yes:** Continue with the next step.

**No:** Go to step 8.

6. Is the RJ-45 connector on the external cable correctly wired according to the EIA/TIA-568A standard? That is,

- Pins 1 and 2 using the same twisted pair,
- Pins 3 and 6 using the same twisted pair,
- Pins 4 and 5 using the same twisted pair,
- Pins 7 and 8 using the same twisted pair.

**Yes:** Continue with the next step.

**No:** Replace the external cable with correctly wired cable. **This ends the procedure.**

7. Do the Line Speed and Duplex values of the line description (DSPLINETH) match the corresponding values for the network device (router, hub or switch) port?

**No:** Change the Line Speed and/or Duplex value for either the line description or the network device (router, hub or switch) port. **This ends the procedure.**

**Yes:** Go to step 9 on page 58.

8. Is the cable wrap test option available as a *Verify* test option for the hardware you are testing?

- **Yes:** Verify the external cable by running the cable wrap test. A wrap plug is required to perform the test. This plug is available from your hardware service provider.

Does the cable wrap test complete successfully?

**Yes:** Continue with the next step.

**No:** The problem is in the cable. Exchange the cable. **This ends the procedure.**

- **No:** The communications IOA/IOP is not the failing item. One of the following could be causing the problem.

- External cable.
  - The network.
  - Any system or device on the network
  - The configuration of any system or device on the network.
  - Intermittent problems on the network.
  - A new SRC - perform problem analysis or ask your next level of support for assistance.
- Work with the customer or your next level of support to correct the problem. **This ends the procedure.**

9. All the local hardware is good. This completes the local hardware verification. The communications IOA/IOP and/or external cable is not the failing item.

One of the following could be causing the problem:

- The network
- Any system or device on the network
- The configuration of any system or device on the network
- Intermittent problems on the network
- A new SRC - perform problem analysis or ask your next level of support for assistance

Work with the customer or your next level of support to correct the problem. **This ends the procedure.**

## Disk unit isolation procedure

Provides a procedure to isolate a failure in a disk unit.

Please read and observe all safety procedures before servicing the system and while performing the disk unit isolation procedure.

**Attention:** Unless instructed otherwise, always power off the system or expansion tower where the FRU is located, (see Powering on and powering off) before removing, exchanging, or installing a field-replaceable unit (FRU).

### DSKIP03

Use this procedure to determine the reference code, which is used to isolate a problem and to determine the failing device.

**Note:** When exchanging a disk unit, go to disk unit recovery procedures.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to determining if the system has logical partitions.
2. Look in the Service action log for other errors logged at or around the same time as the 310x SRC. If no entries appear in the service action log, use the product activity log . Use the other SRCs to correct the problem before performing an IPL. Contact your next level of support as necessary for assistance with SCSI bus problem isolation. If the problem is not corrected, continue with the next step.
3. Perform an IPL to dedicated service tool (DST). See dedicated service tools.
 

Does an SRC appear on the control panel?

  - **Yes:** Go to step 6 on page 59.
  - **No:** Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear?
    - Yes:** Continue with the next step.
    - No:** Go to step 5 on page 59.

4. Does one of the following messages appear in the list?
  - Missing disk units in the configuration
  - Missing mirror protection disk units in the configuration
  - Device parity protected units in exposed mode
    - **No:** Continue with the next step.
    - **Yes:** Select option **5**, press **F11**, and then press **Enter** to display the details.  
If any of the reference codes are not 0000, go to step 6 and use the reference code that is not 0000.

**Note:** Use the characters in the *Type* column to find the correct reference code table.
5. Does the Display Failing System Bus display appear?
  - **No:** Look at all the Product activity logs by selecting **Product activity log** under DST (see dedicated service tools). If there is more than one SRC logged, use an SRC that is logged against the IOP or IOA.  
Is an SRC logged as a result of this IPL?  
**Yes:** Continue with the next step.  
**No:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. If the failing item list contains FI codes, see using failing item codesto help determine part numbers and location in the system.  
**This ends the procedure.**
  - **Yes:** Use the reference code that is displayed under *Reference Code* to correct the problem. **This ends the procedure.**
6. Record the SRC.  
Is the SRC the same one that sent you to this procedure?  
**Yes:** Continue with the next step.  
**No:** Perform problem analysis to correct the problem. **This ends the procedure.**
7. Perform the following:
  - a. Power off the system or expansion tower.
  - b. See using failing item codesto find the devices identified by FI code FI01106.
  - c. Disconnect one of the disk units, (other than the load-source disk unit), the tape units, or the optical storage units that are identified by FI code FI01106. Slide it partially out of the system.  
  
**Note:** Do not disconnect the load-source disk unit, although FI code FI01106 may identify it.
8. Power on the system or the expansion tower that you powered off.  
Does an SRC appear on the control panel?  
**No:** Continue with the next step.  
**Yes:** Go to step 12 on page 60.
9. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear with one of the following listed?
  - Missing disk units in the configuration
  - Missing mirror protection disk units in the configuration
  - Device parity protected units in exposed mode
    - Yes:** Continue with the next step.
    - No:** Go to step 11 on page 60.
10. Select option **5**, press **F11**, and then press **Enter** to display details.  
Does an SRC appear in the Reference Code column?  
**No:** Continue with the next step.

**Yes:** Go to step 12.

11. Look at all the Product activity logs by selecting **Product activity log** under DST.

Is an SRC logged as a result of this IPL?

- **Yes:** Continue with the next step.
- **No:** The last device you disconnected is the failing item. Exchange the failing device and reconnect the devices that were disconnected previously.

**Note:** Before exchanging a disk drive, you should attempt to save customer data. See the backing up and recovering instructions.

**This ends the procedure.**

12. Record the SRC.

Is the SRC the same one that sent you to this procedure?

- **No:** Continue with the next step.
- **Yes:** The last device you disconnected is not the failing item.
  - a. Leave the device disconnected and go to step 7 on page 59 to continue isolation.
  - b. If you have disconnected all devices that are identified by FI code FI01106 except the load-source disk unit, reconnect all devices. Then, go to step 15.

13. Does the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear with one of the following listed?

- Missing disk units in the configuration
- Missing mirror protection disk units in the configuration
- Device parity protected units in exposed mode

**Yes:** Continue with the next step.

**No:** Use the reference code to correct the problem. **This ends the procedure.**

14. Select option 5, press **F11**, and then press **Enter** to display details.

Are all the reference codes 0000?

- **No:** Use the reference code to correct the problem. **This ends the procedure.**
- **Yes:** The last device you disconnected is the failing item.
  - a. Reconnect all devices except the failing item.
  - b. Before exchanging a disk unit, go to using location codes. **This ends the procedure.**

15. Was disk unit 1 (the load-source disk unit) a failing item that FI code FI01106 identified?

**Yes:** The failing items that FI code FI01106 identified are not failing. The load-source disk unit may be failing. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. If the failing item list contains FI codes, see using failing item codes to help determine part numbers and location in the system. **This ends the procedure.**

**No:** The failing items that FI code FI01106 identified are not failing. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. If the failing item list contains FI codes, see using failing item codes to help determine part numbers and location in the system. **This ends the procedure.**

---

## Intermittent isolation procedures

These procedures help you to correct an intermittent problem.

### DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

Use these procedures to correct an intermittent problem, if other problem analysis steps or tables sent you here. Only perform the procedures that apply to your system.

Read all safety procedures before servicing the system. Observe all safety procedures when performing a procedure. Unless instructed otherwise, always power off the system or expansion unit where the FRU is located. See Powering on and powering off the system before removing, exchanging, or installing a field-replaceable unit (FRU).

Use the procedure below to identify intermittent problems and the associated corrective actions.

## INTIP03

Use this procedure to isolate problems with external noise on AC voltage lines.

### DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

Electrical noise on incoming ac voltage lines can cause various system failures. The most common source of electrical noise is lightning.

1. Ask the customer if an electrical storm was occurring at the time of the failure to determine if lightning could have caused the failure.

Could lightning have caused the failure?

**No:** Go to step 3 on page 63.

**Yes:** Continue with the next step.

2. Determine if lightning protection devices are installed on the incoming ac voltage lines where they enter the building. There must be a dedicated ground wire from the lightning protection devices to earth ground.

Are lightning protection devices installed?

**Yes:** Continue with the next step.

**No:** Lightning may have caused the intermittent problem. Recommend that the customer install lightning protection devices to prevent this problem from recurring. **This ends the procedure.**

3. Have an installation planning representative perform the following:
  - a. Connect a recording ac voltage monitor to the incoming ac voltage lines of the units that contain the failing devices with reference to ground.
  - b. Set the voltage monitor to start recording at a voltage slightly higher than the normal incoming ac voltage.

Does the system fail again with the same symptoms?

**No: This ends the procedure.**

**Yes:** Continue with the next step.

4. Look at the recording and see if the voltage monitor recorded any noise when the failure occurred. Did the monitor record any noise when the failure occurred?

**Yes:** Review with the customer what was happening external to the system when the failure occurred. This may help you to determine the source of the noise. Discuss with the customer what to do to remove the noise or to prevent it from affecting the server. **This ends the procedure.**

**No:** Perform the next intermittent isolation procedure listed in the *Isolation procedure* column. **This ends the procedure.**

## INTIP05

Use this procedure to isolate problems with external noise on twinaxial cables.

Electrical noise on twinaxial cables that are not installed correctly may affect the twinaxial workstation I/O processor card.

Examples of this include open shields on twinaxial cables, and station protectors that are not being installed where necessary.

Check for the following on the system:

- There must be no more than 11 connector breaks in a twinaxial cable run.
- Station protectors must be installed (in pairs) where a cable enters or leaves a building.
- There can only be two station protectors for each twinaxial run.
- There is a maximum of seven devices (with addresses 0-6) for each cable run.
- There is a maximum cable length of 1524 meters (5000 feet) for each port.
- All cable runs must be ended (terminated).
- Disconnect all twinaxial cables that are not used.
- Remove any cause of electrical noise in the twinaxial cables.
- All workstations must be grounded.

**This ends the procedure.**

## INTIP07

Use this procedure to lessen the effects of electrical noise (electromagnetic interference, or EMI) on the system.

1. Ensure that air flow cards are installed in all adapter card slots that are not used.
2. Keep all cables away from sources of electrical interference, such as ac voltage lines, fluorescent lights, arc welding equipment, and radio frequency (RF) induction heaters. These sources of electrical noise can cause the system to become powered off.
3. If you have an expansion unit, ensure that the cables that attach the system unit to the expansion unit are seated correctly.

**Note:** If the failures occur when people are close to the system or machines that are attached to the system, the problem may be electrostatic discharge (ESD).

4. Have an **installation planning representative** use a radio frequency (RF) field intensity meter to determine if there is an unusual amount of RF noise near the server. You also can use it to help determine the source of the noise. **This ends the procedure.**

## INTIP08

Use this procedure to ensure that the system is electrically grounded correctly.

1. Have an **installation planning representative** or an electrician (when necessary), perform the following steps.
2. Power off the server and the power network branch circuits before performing this procedure.
3. Ensure the safety of personnel by making sure that all electrical wiring in the United States meets National Electrical Code requirements.
4. Check *all* system receptacles to ensure that each one is wired correctly. This includes receptacles for the server and all equipment that attaches to the server, including workstations. Do this to determine if a wire with primary voltage on it is swapped with the ground wire, causing an electrical shock hazard.
5. For each unit, check continuity from a conductive area on the frame to the ground pin on the plug. Do this at the end of the mainline ac power cable. The resistance must be 0.1 ohm or less.
6. Ground continuity must be present from each unit receptacle to an effective ground. Therefore, check the following:
  - The ac voltage receptacle for each unit must have a ground wire connected from the ground terminal on the receptacle to the ground bar in the power panel.
  - The ground bars in all branch circuit panels must be connected with an insulated ground wire to a **ground point**, which is defined as follows:
    - The nearest available metal cold water pipe, only if the pipe is effectively grounded to the earth (see *National Electric Code* Section 250-81, in the United States).
    - The nearest available steel beams in the building structure, only if the beam is effectively grounded to the earth.
    - Steel bars in the base of the building or a metal ground ring that is around the building under the surface of the earth.
    - A ground rod in the earth (see *National Electric Code* Section 250-83, in the United States).

**Note:** For installations in the United States only, by National Electrical Code standard, if more than one of the preceding grounding methods are used, they must be connected together electrically. See *National Electric Code* Section 250, for more information on grounding.

- The grounds of all separately derived sources (uninterruptable power supply, service entrance transformer, system power module, motor generator) must be connected to a **ground point** as defined above.
- The service entrance ground bar must connect to a **ground point** as defined above.
- All ground connections **must be tight**.
- Check continuity of the ground path for each unit that is using an ECOS tester, Model 1023-100. Check continuity at each unit receptacle, and measure to the **ground point** as defined above. The total resistance of each ground path must be 1.0 ohm or less. If you cannot meet this requirement, check for faults in the ground path.
- Conduit is sometimes used to meet wiring code requirements. If conduit is used, the branch circuits must still have a green (or green and yellow) wire for grounding as stated above.

**Note:** The ground bar and the neutral bar must never be connected together in branch circuit power panels.

The ground bar and the neutral bar in the power panels that make up the electrical power network for the server must be connected together. This applies to the first electrically isolating unit that is found in the path of electrical wiring from the server to the service entrance power panel. This isolating unit is sometimes referred to as a **separately derived source**. It can be an uninterruptable power supply, the system power module for the system, or the service entrance transformer. If the building has none of the above isolating units, the ground bar and the neutral bar must be connected together in the service entrance power panel.

7. Look inside all power panels to ensure the following:
  - There is a separate ground wire for each unit.
  - The green (or green and yellow) ground wires are connected only to the ground bar.
  - The ground bar inside each power panel is connected to the frame of the panel.
  - The neutral wires are connected only to the neutral bar.
  - The ground bar and the neutral bar are not connected together, except as stated in step 6 on page 64.
8. For systems with more than one unit, ensure that the ground wire for each unit is not connected from one receptacle to the next in a string. Each unit must have its own ground wire, which goes to the power source.
9. Ensure that the grounding wires are insulated with green (or green and yellow) wire at least equal in size to the phase wires. The grounding wires also should be as short as possible.
10. If extension-mainline power cables or multiple-outlet power strips are used, make sure that they must have a three-wire cable. One of the wires must be a ground conductor. The ground connector on the plug must not be removed. This applies to any extension mainline power cables or multiple-outlet power strips that are used on the server. It also applies for attaching devices such as personal computers, workstations, and modems.

**Note:** Check all extension-mainline power cables and multiple-outlet power strips with an ECOS tester and with power that is applied. Ensure that no wires are crossed (for example, a ground wire crossed with a wire that has voltage on it).

**This ends the procedure.**

## INTIP09

Use this procedure to check the AC electrical power for the system.

1. Have an **installation planning representative** or an electrician (when necessary), perform the following steps.
2. Power off the server and the power network branch circuits before performing this procedure.
3. To ensure the safety of personnel, all electrical wiring in the United States must meet National Electrical Code requirements.
4. Check **ALL** system receptacles to ensure that each is wired correctly. This includes receptacles for the server and all equipment that attaches to the server, including workstations. Do this to determine if a wire with primary voltage on it has been swapped with the ground wire, causing an electrical shock hazard.
5. When three-phase voltage is used to provide power to the server, correct balancing of the load on each phase is important. The units should be connected so that all three phases are used equally.
6. The power distribution neutral must return to the "separately derived source" (uninterruptable power supply, service entrance transformer, system power module, motor generator) through an insulated wire that is the same size as the phase wire or larger.
7. The server and its attached equipment should be the only units that are connected to the power distribution network that the server gets its power.
8. The equipment that is attached to the server, such as workstations and printers, must be attached to the power distribution network for the server when possible.
9. Check all circuit breakers in the network that supply ac power to the server as follows:

- Ensure that the circuit breakers are installed tightly in the power panel and are not loose.
  - Feel the front surface of each circuit breaker to detect if it is warm. A warm circuit breaker may be caused by:
    - The circuit breaker that is not installed tightly in the power panel.
    - The contacts on the circuit breaker that is not making a good electrical connection with the contacts in the power panel.
    - A defective circuit breaker.
    - A circuit breaker of a smaller current rating than the current load which is going through it.
    - Devices on the branch circuit which are using more current than their rating.
10. Equipment that uses a large amount of current, such as: Air conditioners, copiers, and FAX machines, should not receive power from the same branch circuits as the system or its workstations. Also, the wiring that provides ac voltage for this equipment should not be placed in the same conduit as the ac voltage wiring for the server. The reason for this is that this equipment generates ac noise pulses. These pulses can get into the ac voltage for the server and cause intermittent problems.
11. Measure the ac voltage to each unit to ensure that it is in the normal range.  
Is the voltage outside the normal range?
- No:** Continue with the next step.
- Yes:** Contact the customer to have the voltage source returned to within the normal voltage range.
12. *The remainder of this procedure is only for a server that is attached to a separately derived source.* Some examples of separately derived sources are an uninterruptable power supply, a motor generator, a service entrance transformer, and a system power module. The ac voltage system must meet all the requirements that are stated in this procedure and also all of the following:

**Notes:**

- a. The following applies to an uninterruptable power supply, but it can be used for any separately derived source.
- b. System upgrades **must not** exceed the power requirements of your derived source.

The uninterruptable power supply must be able to supply the peak repetitive current that is used by the system and the devices that attach to it. The uninterruptable power supply can be used over its maximum capacity if it has a low peak repetitive current specification, and the uninterruptable power supply is already fully loaded. Therefore, a de-rating factor for the uninterruptable power supply must be calculated to allow for the peak-repetitive current of the complete system. To help you determine the de-rating factor for an uninterruptable power supply, use the following:

**Note:** The peak-repetitive current is different from the "surge" current that occurs when the server is powered on.

The de-rating factor equals the crest factor multiplied by the RMS load current divided by the peak load current where the:

- Crest factor is the peak-repetitive current rating of the uninterruptable power supply that is divided by the RMS current rating of the uninterruptable power supply. If you do not know the crest factor of the uninterruptable power supply, assume that it is 1.414.
- RMS load current is the steady state RMS current of the server as determined by the power profile.
- Peak load current is the steady state peak current of the server as determined by the power profile.

For example, if the de-rating factor of the uninterruptable power supply is calculated to be 0.707, then the uninterruptable power supply must not be used more than 70.7% of its kVA-rated

capacity. If the kVA rating of the uninterruptable power supply is 50 kVA, then the maximum allowable load on it is 35.35 kVA (50 kVA multiplied by 0.707).

When a three-phase separately derived source is used, correct balancing of the load as specified in step 5 on page 65 is *critical*. If the load on any one phase of an uninterruptable power supply is more than the load on the other phases, the voltage on all phases may be reduced.

13. If the system is attached to an uninterruptable power supply or motor generator, then check for the following:
  - The system and the attached equipment should be the only items that are attached to the uninterruptable power supply or motor generator. Equipment such as air conditioners, copiers, and FAX machines should not be attached to the same uninterruptable power supply, or motor generator that the system is attached.
  - The system unit console and the Electronic Customer Support modem must get ac voltage from the same uninterruptable power supply or motor generator to which the system is attached. **This ends the procedure.**

## INTIP14

Use this procedure to isolate problems with station protectors.

Station protectors must be installed on all twinaxial cables that leave the building in which the server is located. This applies even if the cables go underground, through a tunnel, through a covered outside hallway, or through a skyway. Station protectors help prevent electrical noise on these cables from affecting the server.

1. Look at the Product Activity Log to determine what workstations are associated with the failure.
2. Determine if station protectors are installed on the twinaxial cables to the failing workstations.

Are station protectors installed on the twinaxial cables to the failing workstations?

**Yes:** Perform the next intermittent isolation procedure listed in the *Isolation procedure* column. **This ends the procedure.**

**No:** You may need to install station protectors on the twinaxial cables to the failing workstations. **This ends the procedure.**

## INTIP16

Use this procedure when you need to copy a main storage dump to give to your next level of support.

For some problems, performing a dump of main storage helps to analyze the problem. The data on the dump is analyzed by support personnel to determine the cause of the problem and how to correct it.

1. Copy the main storage dump to tape. See Copying a dump.
2. Ask your next level of support to determine for assistance. **This ends the procedure.**

## INTIP18

Use this procedure to determine if one or more PTFs are available to correct this specific problem.

1. Ensure that all PTFs that relate to the problem have been installed.

**Note:** Ensure that the latest platform LIC fix has been installed before you exchange a service processor.

2. Contact your next level of support for more information. **This ends the procedure.**

## INTIP20

Use this procedure to analyze system performance problems.

1. Look in the Product Activity Log, ASM log, or HMC to determine if any hardware errors occurred at the same time that the performance problem occurred. Did any hardware problems occur at the same time that the performance problem occurred?

**Yes:** Perform problem analysis and correct the hardware errors. **This ends the procedure.**

**No:** The performance problems are not related to hardware. Continue with the next step.

2. Perform the following steps:
  - a. Ask the customer if they have asked software support for any software PTFs that relate to this problem.
  - b. Recommend that the customer install a cumulative PTF package if they have not done so in the past three months.
  - c. Inform the customer that performance could possibly be improved by having Software Support analyze the conditions.
  - d. Inform the customer that your service provider has performance tools. Contact Software Support for more information. **This ends the procedure.**

## INTIP24

Use this procedure to collect data when the service processor reports a suspected intermittent problem.

It is important that you collect data for this problem so that the problem can be corrected. Use this procedure to collect the data.

There are several ways the system can display the SRC. Follow the instructions for the correct display method, defined as follows:

- If this SRC is displayed in the Product Activity Log or ASM log, then record all of the SRC data words, save all of the error log data, and contact your next level of support to submit an APAR.
- If the control panel is displaying SRC data words scrolling automatically through control panel functions 11, 12 and 13, and the control panel user interface buttons are not responding, then perform "FSPSP02" on page 226 instead of using this procedure.
- If the SRC is displayed at the control panel, and the control panel user interface buttons respond normally, then record all of the SRC words.

Do not perform an IPL until you perform a storage dump of the service processor. To get a storage dump of the service processor, perform the following:

1. Record the complete system reference code (SRC) (functions 11 through 20).
2. Perform a service processor dump. See Performing dumps.
3. Is a display shown on the console?
  - **Yes:** Continue with the next step.
  - **No:** The problem is not intermittent. Choose from the following options:
    - If you were sent here from another procedure, return there and follow the procedure for a problem that is not intermittent.
    - If the problem continues, replace the service processor hardware. **This ends the procedure.**
4. The problem is intermittent. Copy the IOP dump to tape. See Performing dumps.
5. Complete the IPL.
6. Determine if there are available program temporary fixes (PTFs) for this problem.
7. If a PTF is found, apply the PTF. Then, return here and answer the following question.  
Did you find and apply a PTF for this problem?
  - **Yes: This ends the procedure.**
  - **No:** Record the following information, and contact your next level of support.
    - The complete SRC you recorded in this procedure

- The service processor dump to tape you obtained in step 4 on page 68.
  - All known system symptoms:
    - How often the intermittent problem occurs
    - System environment (IPL, certain applications)
    - If necessary, other SRCs that you suspect relate to the problem
  - Information needed to write an LICTR. **This ends the procedure.**
- 

## **I/O processor isolation procedures**

Isolate a failure in the multiple function I/O card.

Please read all safety procedures before servicing the system.

**Attention:** Unless instructed otherwise, always power off the system or expansion tower where the field replaceable unit (FRU) is located before removing, exchanging, or installing a FRU.

**Attention:** Disconnecting the J15 and J16 cables will not prevent the system unit from powering on.

## DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

## IOPIP01

Use this procedure to perform an IPL to dedicated service tool (DST) to determine if the same reference code occurs.

If a new reference code occurs, more analysis may be possible with the new reference code. If the same reference code occurs, you are instructed to exchange the failing items.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions, before continuing with this procedure.
2. Was the IPL performed from disk (Type A or Type B)?
  - No: Continue with the next step.
  - Yes: Go to step 5 on page 71.
3. Perform the following:
  - a. Ensure that the IPL media is the correct version and level that are needed for the system model.
  - b. Ensure that the media is not physically damaged.
  - c. Choose from the following options to clean the IPL media:

- If it is cartridge type optical media (for example, DVD), do not attempt to clean the media.
  - If it is non-cartridge type media (for example, CD-ROM), wipe the disc in a straight line from the inner hub to the outer rim. Use a soft, lint-free cloth or lens tissue. Always handle the disc by the edges to avoid finger prints.
  - If it is tape, clean the recording head in the tape unit. Use the correct Cleaning Cartridge Kit provided by your service provider.
4. Perform a Type D IPL in **Manual** mode.
- Does a system reference code (SRC) appear on the control panel?
- **No:** Go to step 8.
  - **Yes:** Is the SRC the same one that sent you to this procedure?
    - Yes:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. Refer to the reference code list. If the failing item list contains FI codes, see System FRU locations to help determine part numbers and location in the system. **This ends the procedure.**
    - No:** A different SRC occurred. Use the new SRC to correct the problem. See Start of Call. **This ends the procedure.**
5. Perform an IPL to DST. See Performing an IPL to dedicated service tools.
- Does an SRC appear on the control panel?
- No:** Continue with the next step.
  - Yes:** Go to step 10 on page 72.
6. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?
- **No:** Continue with the next step.
  - **Yes:** Select option 5, press **F11**, then press **Enter** to display the details. Then, choose from the following options:
    - If all of the reference codes are 0000, go to “LICIP11” on page 106 and use cause code 0002.
    - If any of the reference codes are not 0000, go to step 10, and use the reference code that is not 0000.
- Note:** Use the characters in the *Type* column to find the correct reference code table.
7. Look at the product activity log. See “Using the product activity log” on page 73 for details.
- Is an SRC logged as a result of this IPL?
- Yes:** Continue with the next step.
  - No:** The problem cannot be isolated any more. Use the original SRC and exchange the failing items. Start with the highest probable cause of failure in the failing item list for this reference code. If the failing item list contains FI codes, see System FRU locations to help determine part numbers and location in the system. **This ends the procedure.**
8. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?
- **Yes:** Continue with the next step.
  - **No:** Look at the product activity log. See “Using the product activity log” on page 73 for details.
- Is an SRC logged as a result of this IPL?
- Yes:** Continue with the next step.
  - No:** The problem is corrected. **This ends the procedure.**
9. Select option 5, press **F11**, then press **Enter** to display the details. Then, choose from the following options:
- If all of the reference codes are 0000, go to “LICIP11” on page 106 and use cause code 0002.

- If any of the reference codes are not 0000, continue with the next step and use the reference code that is not 0000.

**Note:** Use the characters in the *Type* column to find the correct reference code table.

10. Record the SRC.

Are the SRC and unit reference code (URC) the same ones that sent you to this procedure?

**Yes:** Continue with the next step.

**No:** Use the new SRC or reference code to correct the problem. **This ends the procedure.**

11. Perform the following steps:

- a. Power off the system or expansion tower. See Powering on and powering off the system .
- b. Exchange the FRUs in the failing item list for the SRC you have now. Start with the highest probable cause of failure in the failing item column in the reference code list. Perform the remaining steps of this procedure after you exchange each FRU until you determine the failing FRU.

**Note:** If you exchange a disk unit, do not attempt to save customer data until instructed to do so in this procedure.

12. Power on the system or the expansion unit. See Powering on and powering off the system .

Does an SRC appear on the control panel?

**No:** Continue with the next step.

**Yes:** Go to step 16.

13. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?

- **Yes:** Continue with the next step.
- **No:** Look at the product activity log. See “Using the product activity log” on page 73 for details. Is an SRC logged as a result of this IPL?
  - **Yes:** Continue with the next step.
  - **No:** The last FRU you exchanged was failing.

**Note:** Before exchanging a disk unit, you should attempt to save customer data.

**This ends the procedure.**

14. Select option 5, press **F11**, then press **Enter** to display the details. Then, choose from the following options:

- If all of the reference codes are 0000, go to “LICIP11” on page 106 and use cause code 0002.
- If any of the reference codes are not 0000, go to step 10, and use the reference code that is not 0000.

**Note:** Use the characters in the *Type* column to find the correct reference code table.

15. Record the SRC on the Problem summary form. See “Using the product activity log” on page 73 for details.

Is the SRC the same one that sent you to this procedure?

- **Yes:** The last FRU you exchanged is not the failing FRU. Go to step 12 to continue FRU isolation.
- **No:** Is the SRC B100 4504 or B100 4505 and have you exchanged disk unit 1 in the system unit, or are all the reference codes on the console 0000?
  - **Yes:** The last FRU you exchanged was failing. **This ends the procedure.**

**Note:** Before exchanging a disk unit, you should attempt to save customer data.

– **No:** Use the new SRC or reference code to correct the problem. **This ends the procedure.**

## Using the product activity log

This procedure can help you learn how to use the Product Activity Log (PAL).

1. To locate a problem, find an entry in the product activity log for the symptom you are seeing.

- a. On the command line, enter the Start System Service Tools command:

STRSST

If you cannot get to SST, select DST.

**Note:** Do not IPL the system or partition to get to DST.

- b. On the Start Service Tools Sign On display, type in a User ID with service authority and password.
- c. From the System Service Tools display, select **Start a Service Tool** → **Product activity log** → **Analyze log**.
- d. On the Select Subsystem Data display, select the option to view **All Logs**.

**Note:** You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.

- e. Use the defaults on the Select Analysis Report Options display by pressing the Enter key.
- f. Search the entries on the Log Analysis Report display.

**Note:** For example, a 6380 Tape Unit error would be identified as follows:

**System Reference Code:** 6380CC5F

**Class:** Perm

**Resource Name:** TAP01

2. Find an SRC from the product activity log that best matches the time and type of the problem the customer reported.

Did you find an SRC that matches the time and type of problem the customer reported?

**Yes:** Use the SRC information to correct the problem. **This ends the procedure.**

**No:** Contact your next level of support. **This ends the procedure.**

## IOPIP13

Use this procedure to isolate problems on the interface between the I/O card and the storage devices.

The unit reference code (part of the SRC that sent you to this procedure) indicates the SCSI bus that has the problem:

Unit reference code (URC)	SCSI bus
3100	0
3101	1
3102	2
3103	3

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions.
2. Were you performing an IPL from removable media (IPL type D) when the error occurred?  
**No:** Continue with the next step.  
**Yes:** Exchange the FRUs in the failing item list for the reference code that sent you to this procedure. **This ends the procedure.**
3. Perform the following steps:
  - a. Look in the service action log (see Searching the service action log) for other errors logged at or around the same time as the 310x SRC.

- b. If no entries appear in the service action log, use the product activity log (see Using the product activity log).
  - c. Use the other SRCs to correct the problem before performing an IPL.
  - d. Contact your next level of support as necessary for assistance with SCSI bus problem isolation.
  - e. If the problem is not corrected, continue with the next step.
4. Perform an IPL to DST. See Performing an IPL to dedicated service tools . Does an SRC appear on the control panel?
- No:** Continue with the next step.
  - Yes:** Go to step 7.
5. Does one of the following displays appear on the console?
- Disk Configuration Error Report
  - Disk Configuration Attention Report
  - Disk Configuration Warning Report
  - Display Unknown Mirrored Load-Source Status
  - Display Load-Source Failure
    - **Yes:** Continue with the next step.
    - **No:** Look at the product activity log. See Using the product activity log for details.
- Is an SRC logged as a result of this IPL?
- **Yes:** Continue with the next step.
  - **No:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure see the failing item list for this reference code. If the failing item list contains FI codes, see the System FRU locations topic to help determine part numbers and location in the system. **This ends the procedure.**
6. Are all of the reference codes 0000? On some of the displays, you must press **F11** to display reference codes.
- **No:** Continue with the next step. Use the reference code that is not 0000.
  - **Yes:** Go to “LICIP11” on page 106 and use cause code 0002. **This ends the procedure.**
7. Is the SRC the same one that sent you to this procedure?
- Yes:** Continue with the next step.
  - No:** Record the SRC. Then use the SRC description to correct the problem. **This ends the procedure.**
8. Perform the following:
- a. Power off the system or the expansion tower. See Powering on and powering off the system for details.
  - b. Find the I/O card identified in the failing item list.
  - c. Remove the I/O card and install a new I/O card. This item has the highest probability of being the failing item.
  - d. Power on the system or the expansion tower.
- Does an SRC appear on the control panel?
- No:** Continue with the next step.
  - Yes:** Go to step 12 on page 75.
9. Does one of the following displays appear on the console?
- Disk Configuration Error Report
  - Disk Configuration Attention Report
  - Disk Configuration Warning Report
  - Display Unknown Mirrored Load-Source Status
  - Display Load-Source Failure

- **Yes:** Does the Display Unknown Mirrored Load-Source Status display appear on the console?  
**Note:** On some of these displays, you must press **F11** to display reference codes.
    - **Yes:** Continue with the next step.
    - **No:** Are all of the reference codes 0000?
      - **No:** Go to step 12 using the reference code that is not 0000.
      - **Yes:** Go to “LICIP11” on page 106 and use cause code 0002. **This ends the procedure.**
  - **No:** Go to step 11.
10. Is the reference code the same one that sent you to this procedure?
- **No:** Either a new reference code occurred, or the reference code is 0000. There may be more than one problem. The original I/O card may be failing, but it must be installed in the system to continue problem isolation. Install the original I/O card by doing the following:
    - a. Power off the system or the expansion tower. See Powering on and powering off the system for details.
    - b. Remove the I/O card you installed in step 8 on page 74 and install the original I/O card.

**Note:** Do not power on the system or the expansion unit now.  
 A device connected to the I/O card could be the failing item. Go to “IOPIP16,” step (9) to continue isolating the problem. **This ends the procedure.**
  - **Yes:** Go to step 13.
11. Look at the product activity log. See Using the product activity log for details. Is an SRC logged as a result of this IPL?
- Yes:** Continue with the next step.
  - No:** The I/O card, which you removed in step 8 on page 74, is the failing item. **This ends the procedure.**
12. Is the SRC or reference code the same one that sent you to this procedure?
- Yes:** Continue with the next step.
  - No:** Record the SRC. Then use the SRC description to correct the problem. **This ends the procedure.**
13. The original I/O card is not the failing item. Install the original I/O card by doing the following:
- a. Power off the system or the expansion tower. See Powering on and powering off the system for details.
  - b. Remove the I/O card you installed in step 8 on page 74 of this procedure and install the original I/O card.
- Note:** Do not power on the system or the expansion unit now.  
 A device connected to the I/O card could be the failing item. Go to “IOPIP16,” step (9) to continue isolating the problem. **This ends the procedure.**

## IOPIP16

Use this procedure to isolate failing devices that are identified by FI codes FI01105, FI01106, and FI01107.

During this procedure, you will remove devices that are identified by the FI code, and then you will perform an IPL to determine if the symptoms of the failure have disappeared, or changed. You should not remove the load-source disk until you have shown that the other devices are not failing. Removing the load-source disk can change the symptom of failure, although it is not the failing unit.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.

2. Use the Hardware Service Manager (HSM) verify function (use DST or SST), and verify that all tape and optical units attached to the SCSI bus (identified by FI01105, FI01106, or FI01107) are operating correctly. See Verify a repair for details.

**Note:** Do not IPL the system to get to DST.

3. Choose from the following options:
  - If verification was successful for all tape and optical units, then go to step 5.
  - If any tape or optical device could not be verified, or if it failed verification, then exchange the failing item. See the System FRU locations and continue with the next step.
4. Use the Hardware Service Manager (HSM) verify function (use SST or DST) and verify that the exchanged item is operating correctly. See Verify a repair for details.

Was the verification successful?

**No:** Replace the exchanged device with the original. See System FRU locations and continue with the next step.

**Yes:** The newly exchanged tape or optical device was the failing item. **This ends the procedure.**

5. Perform an IPL to DST. See Performing an IPL to dedicated service tools .

Does an SRC appear on the control panel?

**No:** Continue with the next step.

**Yes:** Go to step 8.

6. Does one of the following displays appear on the console?
  - Disk Configuration Error Report
  - Disk Configuration Attention Report
  - Disk Configuration Warning Report
  - Display Unknown Mirrored Load-Source Status
  - Display Load-Source Failure

**Note:** On some of these displays, you must press **F11** to display reference codes. The characters under Type are the same as the 4 leftmost characters of word 1. The characters under Reference Code are the same as the 4 rightmost characters of word 1.

– **No:** Continue with the next step.

– **Yes:** Are all of the reference codes 0000?

**No:** Go to step 8, and use the reference code that is not 0000.

**Yes:** Go to “LICIP11” on page 106 and use cause code 0002. **This ends the procedure.**

7. Look at the Product Activity Log. See Using the product activity log for details.

Is a reference code logged as a result of this IPL?

**Yes:** Continue with the next step.

**No:** You cannot continue isolating the problem. Use the original reference code and exchange the failing items, starting with the highest probable cause of failure. If the failing item list contains FI codes, see System FRU locations for additional details. **This ends the procedure.**

8. Is the SRC or reference code the same one that sent you to this procedure?

**Yes:** Continue with the next step.

**No:** Record the SRC or reference code. Then, use the SRC or reference code to correct the problem. **This ends the procedure.**

9. Isolate the failing device by doing the following:
  - a. Power off the system or the expansion unit if it is powered on. See Powering on and powering off the system .
  - b. Go to System FRU locations to find the devices identified by FI code FI01105, FI01106, or FI01107 in the failing item list.

- c. Disconnect one of the devices that are identified by the FI code, other than the load-source disk unit.

**Note:** The tape, or optical units should be the first devices to be disconnected, if they are attached to the SCSI bus identified by FI01105, FI01106, or FI01107.

- d. Go to step 11.
10. Continue to isolate the possible failing items by doing the following:
  - a. Power off the system or the expansion unit. See Powering on and powering off the system .
  - b. Disconnect the next device that is identified by FI codes FI01105, FI01106, or FI01107 in the FRU list. See the note in step 9 on page 76. Do not disconnect disk unit 1 (load-source disk) until you have disconnected all other devices and the load-source disk is the last device that is identified by these FI codes.

11. Power on the system or the expansion tower.

Does an SRC appear on the control panel?

**No:** Continue with the next step.

**Yes:** Go to step 14.

12. Does one of the following displays appear on the console?

- Disk Configuration Error Report
- Disk Configuration Attention Report
- Disk Configuration Warning Report
- Display Unknown Mirrored Load-Source Status
- Display Load-Source Failure

**Note:** On some of these displays, you must press **F11** to display reference codes. The characters under Type are the same as the 4 leftmost characters of word 1. The characters under Reference Code are the same as the 4 rightmost characters of word 1.

– **Yes:** Go to step 14.

– **No:** Look at the Product Activity Log. See Using the product activity log for details. Is a reference code logged as a result of this IPL?

**No:** Continue with the next step.

**Yes:** Go to step 14.

13. You are here because the IPL completed successfully. The last device you disconnected is the failing item.

Is the failing item a disk unit?

**No:** Exchange the failing item and reconnect the devices you disconnected previously. See the System FRU locations. **This ends the procedure.**

**Yes:** Exchange the failing FRU. Before exchanging a disk drive, you should attempt to save customer data. **This ends the procedure.**

14. Is the SRC or reference code the same one that sent you to this procedure?

**Yes:** Continue with the next step.

**No:** Record the SRC or reference code on the Problem summary form. Then go to step 16 on page 78.

15. The last device you disconnected is not failing.

Have you disconnected all the devices that are identified by FI codes FI01105, FI01106, or FI01107 in the FRU list?

**No:** Leave the device disconnected and return to step 10 to continue isolating the possible failing items.

**Yes:** Replace the device backplane or backplanes associated with the devices you removed in the earlier steps. If the device backplane does not fix the problem, then you cannot continue isolating

the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. If the failing item list contains FI codes, see System FRU locations for additional information. **This ends the procedure.**

16. Is the SRC B1xx 4504, and have you disconnected the load-source disk unit? (The load-source disk unit is disconnected by disconnecting disk unit 1.)
- **Yes:** Continue with the next step.
  - **No:** Does one of the following displays appear on the console, and are all reference codes 0000?
    - Disk Configuration Error Report
    - Disk Configuration Attention Report
    - Disk Configuration Warning Report
    - Display Unknown Mirrored Load-Source Status
    - Display Load-Source Failure

**Note:** On some of these displays, you must press **F11** to display reference codes. The characters under Type are the same as the 4 leftmost characters of word 1. The characters under Reference Code are the same as the 4 rightmost characters of word 1.

**Yes:** Continue with the next step.

**No:** A new SRC or reference code occurred. Perform problem analysis and correct the problem. **This ends the procedure.**

17. The last device you disconnected may be the failing item. Exchange the last device you disconnected. See the System FRU locations.

**Note:** Before exchanging a disk drive, you should attempt to save customer data.

Was the problem corrected by exchanging the last device you disconnected?

**No:** Continue with the next step.

**Yes:** **This ends the procedure.**

18. Reconnect the devices you disconnected previously in this procedure.
19. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. Do not exchange the FRU that you exchanged in this procedure. If the failing item list contains FI codes, see System FRU locations to help determine part numbers and location in the system. **This ends the procedure.**

## IOPIP17

Use this procedure to isolate problems that are associated with SCSI bus configuration errors and device task initialization failures.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Were you performing an IPL from removable media (IPL type D) when the error occurred?
  - **Yes:** Exchange the FRUs in the failing item list for the reference code that sent you to this procedure.
  - **No:** Perform an IPL to DST. See Performing an IPL to dedicated service tools.. Does an SRC appear on the control panel?
    - No:** Continue with the next step.
    - Yes:** Go to step 5 on page 79.
3. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?
  - **No:** Continue with the next step.
  - **Yes:** Does one of the following messages appear in the list?

- Missing disk units in the configuration
- Missing mirror protection disk units in the configuration
- Device parity protected units in exposed mode.
  - **No:** Continue with the next step.
  - **Yes:** Select option 5, press **F11**, then press **Enter** to display the details. Then, choose from the following options:
    - If all of the reference codes are 0000, go to “LICIP11” on page 106 and use cause code 0002.
    - If any of the reference codes are not 0000, go to step 5, and use the reference code that is not 0000.

**Note:** Use the characters in the *Type* column to find the correct reference code table.

4. Look at the product activity log. See Searching the service action log. Is an SRC logged as a result of this IPL?

**Yes:** Continue with the next step.

**No:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure (see the failing item list for this reference code in the (System Reference Codes)) topic. If the failing item list contains FI codes, see (Failing items) to help determine part numbers and location in the system. **This ends the procedure.**

5. Record the SRC. Is the SRC the same one that sent you to this procedure?

- **No:** A different SRC or reference code occurred. Use the new SRC or reference code to perform problem analysis and correct the problem. **This ends the procedure.**
- **Yes:** Determine the device unit reference code (URC) from the SRC. If the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appears on the console, the device URC is displayed under *Reference Code*. This is on the same line as the missing device. Is the device unit reference code **3020, 3021, 3022, or 3023**?

**Yes:** Continue with the next step.

**No:** Go to step 7 on page 80.

6. A unit reference code of **3020, 3021, 3022, or 3023** indicates that there is a problem on an I/O card SCSI bus. The problem can be caused by a device that is attached to the I/O card that:

- Is not supported.
- Does not match system configuration rules. For example, there are too many devices that are attached to the bus.
- Is failing.

Perform the following:

- a. Look at the characters on the control panel Data display or the Problem Summary Form for characters 9 - 16 of the top 16 character line of function 12 (word 3). Use the format BBBB-Cc-bb (BBBB = bus, Cc = card, bb = board) to determine the card slot location for the I/O card (see (Locations and addresses)).
- b. The unit reference code indicates the SCSI bus that has the problem:

URC	SCSI Bus
3020	0
3021	1
3022	2
3023	3

- c. To find the bus and device locations. See System FRU locations for information on FRU locations for the system you are servicing .
- d. Find the printout that shows the system configuration from the last IPL and compare it to the present system configuration.

**Note:** If configuration is not the problem, a device on the SCSI bus may be failing.

- e. If you need to perform isolation on the SCSI bus, go to “IOPIP16” on page 75. **This ends the procedure.**
7. The possible failing items are FI codes **FI01105** (90%) and **FI01112** (10%). Find the device unit address from the SRC (see System Reference Code (SRC) Format Description). Use this information to find the physical location of the device. Record the type and model numbers to determine if the addressed I/O card supports this device. Is the device given support on your system?
  - **No:** Continue with the next step.
  - **Yes:** Perform the following:
    - a. Exchange the device.
    - b. Perform an IPL to DST. See Performing an IPL to dedicated service tools.Does this correct the problem?
    - No:** Ask your next level of support for assistance. **This ends the procedure.**
    - Yes:** **This ends the procedure.**
8. Perform the following steps:
  - a. Remove the device.
  - b. Perform an IPL to DST. See Performing an IPL to dedicated service tools..Does this correct the problem?
  - No:** Ask your next level of support for assistance. **This ends the procedure.**
  - Yes:** **This ends the procedure.**

## IOPIP18

Use this procedure to isolate problems that are associated with SCSI bus configuration errors and device task initialization failures.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Perform an IPL to DST. See Performing an IPL to dedicated service tools .

Does an SRC appear on the control panel?

  - **Yes:** Go to step 5 on page 81.
  - **No:** Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?
    - Yes:** Continue with the next step.
    - No:** Go to step 4.
3. Does one of the following messages appear in the list?
  - Missing disk units in the configuration
  - Missing mirror protection disk units in the configuration
  - Device parity protected units in exposed mode.
    - **No:** Continue with the next step.
    - **Yes:** Select option 5, press **F11**, and then press **Enter** to display the details. Choose from the following options:
      - If all of the reference codes are 0000, go to “LICIP11” on page 106 and use cause code 0002.
      - If any of the reference codes are not 0000, go to step 5 on page 81, and use the reference code that is not 0000.

**Note:** Use the characters in the *Type* column to find the correct reference code table.
4. Look at the product activity log (see (Log) for details).

Is an SRC logged as a result of this IPL?

**Yes:** Continue with the next step.

**No:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure in the failing item column in the reference code list. If the failing item list contains FI codes, see System FRU locations to help determine part numbers and location in the system. **This ends the procedure.**

5. Record the SRC.

Is the SRC the same one that sent you to this procedure?

**Yes:** Continue with the next step.

**No:** A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem. **This ends the procedure.**

6. Determine the device unit reference code (URC) from the SRC. If the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appears on the console, the device URC is displayed under *Reference Code*. This is on the same line as the missing device.

Is the device unit reference code 3020?

• **No:** Continue with the next step.

• **Yes:** A device reference code of 3020 indicates that a device is attached to the addressed I/O card. Either it is not supported, or it does not match system configuration rules. For example, there are too many devices that are attached to the bus. Perform the following steps:

- a. Find the printout that shows the system configuration from the last IPL and compare it to the present system configuration.
- b. Use the unit address and the physical address in the SRC to help you with this comparison.
- c. If configuration is not the problem, a device on the SCSI bus may be failing. Use FI code FI00884 in the System FRU locations table to help find the failing device.
- d. If you need to perform isolation on the SCSI bus, go to "IOPIP16" on page 75. **This ends the procedure.**

7. The possible failing items are FI codes FI01105 (90%) and FI01112 (10%).

Find the device unit address from the SRC. Use this information to find the physical location of the device. Record the type and model numbers to determine if the addressed I/O card supports this device.

Is the device given support on your system?

• **No:** Continue with the next step.

• **Yes:** Perform the following steps:

- a. Exchange the device.
- b. Perform an IPL to DST. See Performing an IPL to dedicated service tools .

Does this correct the problem?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** **This ends the procedure.**

8. Perform the following steps:

- a. Remove the device.
- b. Perform an IPL to DST. See Performing an IPL to dedicated service tools .

Does this correct the problem?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** **This ends the procedure.**

## IOPIP19

You were sent to this procedure from unit reference code (URC) 9010, 9011, or 9013.

Contact your next level of support for assistance.

## IOPIP20

Use this procedure to isolate the problem when two or more devices are missing from a disk array.

You were sent to this procedure from unit reference code (URC) 9020 or 9021.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions, before continuing with this procedure.
2. Access SST/DST by doing one of the following:
  - If you can enter a command at the console, access system service tools (SST). See System service tools.
  - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
  - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
3. Have any other I/O card or device SRCs (other than a 902F SRC) occurred at about the same time as this error?
  - **Yes:** Use the other I/O card or device SRCs to correct the problem. **This ends the procedure.**
  - **No:** Has the I/O card, or have the devices been repaired or reconfigured recently?
    - **Yes:** Continue with the next step.
    - **No:** Contact your next level of support for assistance. **This ends the procedure.**
4. Did you perform a D IPL to get to DST?
  - **Yes:** Continue with the next step.
  - **No:** Perform the following steps:
    - a. Access the Product Activity Log and display the SRC that sent you here and view the "Additional Information" to record the formatted log information. Record all devices that are missing from the disk array. These are the array members that have both a present address of 0 and an expected address that is not 0.

**Note:** There might be more than one Product Activity Log entry with the same Log ID. Access any additional entries by pressing the enter key from the "Display Detail Report for Resource" screen. View the "Additional Information" for each entry to record the formatted log information.

For example: There might be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array.
    - b. Continue with step 6.
5. A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see More information from hexadecimal reports. Record all devices that are missing from the disk array. These are the array members that have both a present address of 0 and an expected address that is not 0.

**Note:** There might be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array. In order to interpret the hexadecimal information for these additional disk units, see More information from hexadecimal reports.
6. There are three possible ways to correct the problem:

- a. Find the missing devices and install them in the correct physical locations in the system. If you can find the missing devices and want to continue with this repair option, then continue with the next step.
  - b. Stop the disk array that contains the missing devices.  
**Attention:** Customer data might be lost.  
 If you want to continue with this repair option, go to step 8.
  - c. Initialize and format the remaining members of the disk array.  
**Attention:** Customer data will be lost.  
 If you want to continue with this repair option, go to step 9.
7. Perform the following:
- a. Install the missing devices in the correct locations in the system. See System FRU locations.
  - b. Power on the system. See Powering on and powering off the system .
- Does the IPL complete successfully?
- No:** You have a new problem. Perform problem analysis and correct the problem. **This ends the procedure.**
- Yes: This ends the procedure.**
8. You have chosen to stop the disk array that contains the missing devices.  
**Attention:** Customer data might be lost.  
 Perform the following:
- a. If you are not already using dedicated service tools, perform an IPL to DST. See Performing an IPL to dedicated service tools .  
 If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
  - b. Select **Work with disk units**.  
 Did you get to DST with a Type D IPL?  
**Yes:** Continue with the next step.  
**No:** Select **Work with disk configuration** → **Work with device parity protection**. Then, continue with the next step.
  - c. Select **Stop device parity protection**.
  - d. Follow the on-line instructions to stop device parity protection.
  - e. Perform an IPL from disk.
- Does the IPL complete successfully?
- No:** You have a new problem. Perform problem analysis and correct the problem. **This ends the procedure.**
- Yes: This ends the procedure.**
9. You have chosen to initialize and format the remaining members of the disk array. Perform the following steps:  
**Attention:** Customer data will be lost.
- a. If you are not already using dedicated service tools, perform an IPL to DST. See Performing an IPL to dedicated service tools .  
 If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
  - b. Select **Work with disk units**.  
 Did you get to DST with a Type D IPL?  
**Yes:** Continue with the next step.  
**No:** Select **Work with disk unit recovery** → **Disk unit problem recovery procedures**, and continue with the next step.
10. Select **Initialize and format disk unit**.
11. Follow the online instructions to format and initialize the disk units.

12. Perform an IPL from disk. Does the IPL complete successfully?

**No:** You have a new problem. Perform problem analysis and correct the problem. **This ends the procedure.**

**Yes:** **This ends the procedure.**

## IOPIP21

Use this procedure to determine the failing disk unit when, a disk unit is not compatible with other disk units in the disk array, or when a disk unit has failed. If the URC is 9025 or 9030, the disk array is running, but it might not be protected.

You were sent to this procedure from a unit reference code (URC) of 9025, 9030, or 9032.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Is the device location information for this SRC available in the service action log (see Searching the service action log for details)?

**Yes:** Exchange the disk unit.

**No:** Continue with the next step.

3. Access SST/DST by doing one of the following:

- If you **can** enter a command at the console, access system service tools (SST). See System service tools.
- If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools .

4. Perform the following steps:

- a. Access the Product Activity Log and display the SRC that sent you here.
- b. Press the **F9** key for address information. This is the I/O card address.

**Note:** There may be more than one entry with the same Log ID. Entries with the same Log ID may be accessed by pressing the **Enter** key from the "Display Detail Report for Resource" screen.

Example: There may be a device specific SRC and/or an xxxx902F SRC entry in the Product Activity Log. The xxxx902F SRC will occur if there are more than 10 disk units in the array.

- c. Continue with the next step.

5. Perform the following steps:

- a. Return to the SST or DST main menu.
- b. Select **Work with disk units** → **Display disk configuration** → **Display disk configuration status**.
- c. On the Display disk configuration status display, look for the devices attached to the I/O card that is identified in step 4.
- d. Find the device that has a status of "DPY/Unknown" or "DPY/Failed". This is the device that is causing the problem. Show the device address by selecting **Display Disk Unit Details** → **Display Detailed Address**. Record the device address.
- e. See System FRU locations and find the diagram of the system unit, or the expansion unit and find the following:
  - The card slot that is identified by the I/O card direct select address
  - The disk unit location that is identified by the device address

Have you determined the location of the I/O card and disk unit that is causing the problem?

**Yes:** Exchange the disk unit that is causing the problem. **This ends the procedure.**

**No:** Ask your next level of support for assistance. **This ends the procedure.**

## IOPIP22

Use this procedure to gather error information and contact your next level of support.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions, before continuing with this procedure.
2. Access SST/DST by doing one of the following:
  - If you **can** enter a command at the console, access system service tools (SST). See System service tools.
  - If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
  - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
3. Did you perform a D IPL to get to DST?
  - **Yes:** Continue with the next step.
  - **No:** Perform the following steps:
    - a. Access the Product Activity Log and display the SRC that sent you here and view the "Additional Information" to record the formatted log information. Record all the information.

**Note:** There may be more than one Product Activity Log entry with the same Log ID. Access any additional entries by pressing the **Enter** key from the "Display Detail Report for Resource" screen. View the "Additional Information" for each entry to record the formatted log information. Example: There may be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array.

- b. Continue with step 5.
4. A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see More information from hexadecimal reports. Record all the information. Then continue with the next step.

**Note:** There may be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array. In order to interpret the hexadecimal information for these additional disk units, see More information from hexadecimal reports.

5. Ask your next level of support for assistance.

**Note:** Your next level of support may require the error information you recorded in the previous step. **This ends the procedure.**

## IOPIP23

You were sent to this procedure from a unit reference code (URC) 9050.

If the failing item is in a migrated tower, use the (*Migrated Expansion Tower Problem Analysis, Repair and Parts*) manual  on the V5R1 Supplemental Manuals web site to fix the problem. Otherwise, contact your next level of support for assistance.

## IOPIP25

Use this procedure to isolate the problem when a device attached to the I/O card has functions that are not given support on the I/O card.

You were sent to this procedure from URC 9008.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions, before continuing with this procedure.

2. Have any other I/O card or device SRCs occurred at about the same time as this error?
  - **Yes:** Use the other I/O card or device SRCs to correct the problem. See the system reference codes. **This ends the procedure.**
  - **No:** Has the I/O card, or have the devices been repaired or reconfigured recently?
    - **Yes:** Continue with the next step.
    - **No:** Contact your next level of support for assistance. **This ends the procedure.**
3. Access SST/DST by doing one of the following:
  - If you **can** enter a command at the console, access system service tools (SST). System service tools.
  - If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools .
  - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
4. Did you perform a D IPL to get to DST?
  - **No:** Access the Product Activity Log and display the SRC that sent you here. Press the **F9** key for address information. This is the I/O card address. Then, view the "Additional Information" to record the formatted log information. Record the addresses that are not 0000 0000 for all devices listed.  
Continue with the next step.
  - **Yes:** Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the I/O Card is in the format BBBB-Cc-bb:
    - BBBB = hexadecimal offsets 4C and 4D
    - Cc = hexadecimal offset 51
    - bb = hexadecimal offset 4F

The unit address of the I/O card is hexadecimal offset 18C through 18F.

A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see More information from hexadecimal reports. Record the addresses that are not 0000 0000 for all devices listed. Continue with the next step.
5. See System FRU locations and find the diagram of the system unit, or the expansion unit. Then find the following:
  - The card slot that is identified by the I/O card direct select address (DSA) and unit address. If there is no IOA with a matching DSA and unit address, the IOP and IOA are one card. Use the IOP with the same DSA.
  - The disk unit locations that are identified by the unit addresses.

Have you determined the location of the I/O card and the devices that are causing the problem?

  - **No:** Ask your next level of support for assistance. **This ends the procedure.**
  - **Yes:** Have one or more devices been moved to this I/O card from another I/O card?
    - Yes:** Continue with the next step.
    - No:** Ask your next level of support for assistance. **This ends the procedure.**
6. Is the I/O card capable of supporting the devices attached, or is it in the correct mode to support the devices attached?
 

**Note:** For information on I/O card modes, see "Storage I/O card modes and jumpers" on page 297.

  - **No:** Remove the devices from the I/O card.

**Note:** You can remove disk units without installing another disk unit, and the system continues to operate.  
**This ends the procedure.**

  - **Yes:** Do you want to continue using these devices with this I/O card?
    - Yes:** Continue with the next step.

- **No:** Either change the I/O card mode or remove the devices from the I/O card. **This ends the procedure.**
7. Initialize and format the disk units by performing the following steps:
- Attention:** Data on the disk unit will be lost.
- a. Access SST or DST.
  - b. Select **Work with disk units**.
 

Did you get to DST with a Type D IPL?

**Yes:** Continue with the next step.

**No:** Select **Work with disk unit recovery** → **Disk unit problem recovery procedures**. Then continue with the next step.
  - c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This may take 30 minutes or longer. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

## IOPIP26

Use this procedure to correct the problem when the I/O card recognizes that the attached disk unit must be initialized and formatted.

You were sent to this procedure from URC 9092.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Have any other I/O card or device SRCs occurred at about the same time as this error?
  - **Yes:** Use the other I/O card or device SRCs to correct the problem. **This ends the procedure.**
  - **No:** Has the I/O card, or have the devices been repaired or reconfigured recently?
 

**Yes:** Continue with the next step.

**No:** Contact your next level of support for assistance. **This ends the procedure.**
3. Access SST/DST by doing one of the following:
  - If you **can** enter a command at the console, access system service tools (SST). See System service tools.
  - If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools for details.
  - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
4. Did you perform a D IPL to get to DST?
  - **Yes:** Continue with the next step.
  - **No:** Perform the following steps:
    - a. Access the Product Activity Log and display the SRC that sent you here.
    - b. Press the **F9** key for address information. This is the I/O card address.
    - c. Then view the "Additional Information" to record the formatted log information.
    - d. Record the addresses that are not 0000 0000 for all devices listed.
    - e. Continue with step 6 on page 88.
5. Perform the following steps:
  - a. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the I/O card is in the format BBBB-Cc-bb:
    - BBBB = hexadecimal offsets 4C and 4D
    - Cc = hexadecimal offset 51
    - bb = hexadecimal offset 4F

The unit address of the I/O card is hexadecimal offset 18C through 18F.

- b. A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see *More information from hexadecimal reports*. Record the addresses that are not 0000 0000 for all devices listed.
  - c. Continue with the next step.
6. See System FRU locations and find the diagram of the system unit, or the expansion unit. Then find the following:
- The card slot that is identified by the I/O card direct select address (DSA) and unit address. If there is no IOA with a matching DSA and unit address, the IOP and IOA are one card. Use the IOP with the same DSA.
  - The disk unit locations that are identified by the unit addresses.
- Have you determined the location of the I/O card and the devices that are causing the problem?
- **No:** Ask your next level of support for assistance. **This ends the procedure.**
  - **Yes:** Have one or more devices been moved to this I/O card from another I/O card?  
**Yes:** Continue with the next step.  
**No:** Ask your next level of support for assistance. **This ends the procedure.**
7. Do you want to continue using these devices with this I/O card?
- **Yes:** Continue with the next step.
  - **No:** Remove the devices from the I/O card.

**Note:** You can remove disk units without installing another disk unit, and the system continues to operate.

**This ends the procedure.**

8. Initialize and format the disk units by performing the following steps:

**Attention:** Data on the disk unit will be lost.

a. Access SST or DST.

b. Select **Work with disk units**.

Did you get to DST with a Type D IPL?

**Yes:** Continue with the next step.

**No:** Select **Work with disk unit recovery** → **Disk unit problem recovery procedures**. Then continue with the next step.

c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This may take 30 minutes or longer. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

## IOPIP27

I/O card cache data exists for a missing or failed device.

You were sent to this procedure from a unit reference code (URC) of 9051.

**Note:** For some storage I/O adapters, the cache card is integrated and not removable.

Having I/O card cache data for a missing or failed device might be caused by the following conditions:

- One or more disk units have failed on the I/O card.
- The cache card of the I/O card was not cleared before it was shipped as a MES to the customer. In addition, the service representative moved devices from the I/O card to a different I/O card before performing a system IPL.
- The cache card of the I/O card was not cleared before it was shipped to the customer. In addition, residual data was left in the cache card for disk units that manufacturing used to test the I/O card.

- The I/O card and cache card were moved from a different system or a different location on this system after an abnormal power off.
- One or more disk units were moved either concurrently, or they were removed after an abnormal power off.

**CAUTION:**

**Any Function 08 power down (including from a D-IPL) is an abnormal power off.**

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Access SST/DST by doing one of the following:
  - If you **can** enter a command at the console, access system service tools (SST). See System service tools.
  - If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools .
  - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
3. Did you perform a D IPL to get to DST?
  - **Yes:** Continue with the next step.
  - **No:** Perform the following steps:
    - a. Access the Product Activity Log and display the SRC that sent you here.
    - b. Press the **F9** key for address information. This is the I/O card address.
    - c. Then view the "Additional Information" to record the formatted log information. Record the device types and serial numbers for those devices that show a unit address of 0000 0000.
    - d. Continue with step 5.
4. Perform the following steps:
  - a. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the I/O card is in the format BBBB-Cc-bb:
    - BBBB = hexadecimal offsets 4C and 4D.
    - Cc = hexadecimal offset 51
    - bb = hexadecimal offset 4F

The unit address of the I/O card is hexadecimal offset 18C through 18F.

A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see More information from hexadecimal reports.
  - b. Record the device types and serial numbers for those devices that show a unit address of 0000 0000.
  - c. Continue with the next step.
5. See System FRU locations and find the diagram of the system unit, or the expansion unit. Find the card slot that is identified by the I/O card direct select address (DSA) and unit address. If there is no IOA with a matching DSA and unit address, the IOP and IOA are one card. Use the IOP with the same DSA.
6. Choose from the following options:
  - If the devices from step 3 of this procedure have never been installed on this system, continue with the next step.
  - If the devices are not in the current system disk configuration, go to step 9 on page 90.
  - Otherwise, the devices are part of the system disk configuration; go to step 11 on page 90.
7. Choose from the following options:
  - If this I/O card and cache card were moved from a different system, continue with the next step.

- Otherwise, the cache card was shipped to the customer without first being cleared. Perform the following:
  - a. Make a note of the serial number, the customer number, and the device types and their serial numbers. These were found in step 3 on page 89.
  - b. Inform your next level of support.
  - c. Then go to step 10 to clear the cache card and correct the URC 9051 problem.
- 8. Install both the I/O card and the cache cards back into their original locations. Then re-IPL the system. There could be data in the cache card for devices in the disk configuration of the original system. After an IPL to DST and a normal power off on the original system, the cache card will be cleared. It is then safe to move the I/O card and the cache card to another location.
- 9. One or more devices that are not currently part of the system disk configuration were installed on this I/O card. Either they were removed concurrently, they were removed after an abnormal power off, or they have failed. Continue with the next step.
- 10. Use the Reclaim IOP cache storage procedure to clear data from the cache for the missing or failed devices as follows:
  - a. Perform an IPL to DST. See Performing an IPL to dedicated service tools .  
If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
  - b. Reclaim the cache adapter card storage. See Reclaiming IOP cache storage.
- 11. Choose from the following options:
  - If this I/O card and cache card were moved from a different location on this system, go to step 8.
  - If the devices from step 3 on page 89 of this procedure are now installed on another I/O card, and they were moved there before the devices were added to the system disk configuration, go to step 7 on page 89. (On an MES, the disk units are sometimes moved from one I/O card to another I/O card. This problem will result if manufacturing did not clear the cache card before shipping the MES.)
  - Otherwise, continue with the next step.
- 12. One or more devices that are currently part of the system disk configuration are either missing or failed, and have data in the cache card. Consider the following:
  - The problem may be because devices were moved from the I/O card concurrently, or they were removed after an abnormal power off. If this is the case, locate the devices, power off the system and install the devices on the correct I/O card.
  - If no devices were moved, look for other errors logged against the device, or against the I/O card that occurred at approximately the same time as this error. Continue the service action by using these system reference codes.

## IOPIP28

You were sent to this procedure from unit reference code (URC) 9052.

If the failing item is in a migrated tower, use the (*Migrated Expansion Tower Problem Analysis, Repair and Parts*) manual on the V5R1 Supplemental Manuals web site  to fix the problem. Otherwise, contact your next level of support for assistance.

## IOPIP29

The failing item is in a migrated tower.

You were sent to this procedure from URC 9012.

Perform SDIOP-PIP29 in the (*Migrated Expansion Tower Problem Analysis, Repair and Parts*) manual on the V5R1 Supplemental Manuals web site .

## IOPIP30

Use this procedure to correct the problem when the system cannot find the required cache data for the attached disk units.

You were sent to this procedure from URC 9050.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.

2. Did you just exchange the storage input/output (I/O) adapter as a result of a failure?

**No:** Continue with step 13 on page 92.

**Yes:** Continue with the next step.

3. Are you working with a 571F/575B card set?

**No:** Go to step 5.

**Yes:** Continue with the next step.

4. Remove the 571F/575B card set. Create a new card set with the following:

**Note:** Label all parts (both original and new) before moving them.

- The **new** replacement 571F storage IOA.
- The cache directory card from the **original** 571F storage IOA.
- The **original** 575B auxiliary cache adapter.

See Separating the 571F/575B card set and moving the cache directory card.

- Ensure that the SCSI cable and the battery power cable on the top edge of the storage side of the card are connected to the top edge of the auxiliary cache side of the card.
- Reinstall this card set into the system and go to step 6.

5. Remove the I/O adapter. Install the **new** replacement storage I/O adapter with the following parts installed on it:

**Note:** Label all parts (both old and new) before moving them.

- The cache directory card from the **original** storage I/O adapter. On adapters with removable cache cards, the cache directory card will move with the removable cache card.
- The removable cache card from the **original** storage I/O adapter (this applies to only the 571E and some 2780 I/O adapters).

See System FRU locations for information on removing and replacing parts..

- If the I/O adapter is attached to an auxiliary cache I/O adapter, ensure that the SCSI cable on the last port of the new replacement storage I/O adapter is connected to the auxiliary cache I/O adapter. For a list of auxiliary cache I/O adapters, see System parts.

6. Did the 9050 SRC that sent you to this procedure occur on a type-D IPL?

**Yes:** Perform a type-D IPL and continue with the next step.

**No:** Continue with the next step.

7. Has a new 9010 or 9050 SRC occurred in the Service Action Log or Product Activity Log?

**No:** Go to step 10 on page 92.

**Yes:** Continue with the next step.

8. Was the new SRC 9050?

**No:** Continue with the next step.

**Yes:** Contact your next level of support. **This ends the procedure.**

9. The new SRC was 9010. Reclaim the cache storage. See Reclaiming IOP cache storage.

**Note:** When an auxiliary cache I/O adapter that is connected to the storage I/O adapter logs a 9055 SRC in the Product Activity Log, the reclaim does not result in lost sectors. Otherwise, the reclaim does result in lost sectors, and the system operator might want to restore data from the most recent saved tape after you complete the repair.

10. Are you working with a 571F/575B card set?

**No:** Go to step 12.

**Yes:** Continue with the next step.

11. Remove the 571F/575B card set. Create a new card set with the following:

- The **new** 571F storage IOA
- The cache directory card from the **new** 571F storage IOA
- The **new** 575B auxiliary cache adapter

See Separating the 571F/575B card set and moving the cache directory card.

- Ensure that the SCSI cable and the battery power cable on the top edge of the storage side of the card are connected to the top edge of the auxiliary cache side of the card.
- Reinstall this card set into the system. **This ends the procedure.**

12. Remove the I/O adapter. Install the **new** replacement storage I/O adapter that has the following parts installed on it:

- The cache directory card from the **new** storage I/O adapter. On adapters with removable cache cards, the cache directory card will move with the removable cache card.
- The removable cache card from the **new** storage I/O adapter (this applies to only the 571E and some 2780 I/O adapters).

See System FRU locations.

- If the I/O adapter is attached to an auxiliary cache I/O adapter, ensure that the SCSI cable on the last port of the new replacement storage I/O adapter is connected to the auxiliary cache I/O adapter. For a list of auxiliary cache I/O adapters, see System parts.

**This ends the procedure**

13. Identify the affected disk units using information in the Product Activity Log. Access SST/DST by doing one of the following:

- If you can enter a command at the console, access system service tools (SST). See System Service Tools.
- If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools .
- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

14. Did you perform a D IPL to get to DST?

- **Yes:** Continue with the next step.
- **No:** Perform the following steps:
  - a. Access the Product Activity Log and display the SRC that sent you here, then view *Additional Information* to record the formatted log information. The *Device Errors detected* field indicates the total number of disk units that are affected. The *Device Errors logged* field indicates the number of disk units for which detailed information is provided. Under the *Device* heading, the unit address, type, and serial number are provided for up to three disk units. Additionally, the controller type and serial number for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

**Note:** You might find more than one Product Activity Log entry with the same Log ID. Access any additional entries by pressing Enter from the Display Detail Report for Resource screen. View *Additional Information* for each entry, and record the formatted log information. For example: You might find an entry for an xxxx902F SRC in the Product Activity Log when the array includes more than 10 disk units.

- b. Continue with step 16.
15. A formatted display of hexadecimal information for Product Activity Log entries is not available. To interpret the hexadecimal information, see *More information from hexadecimal reports*. The *Device Errors detected* field indicates the total number of disk units that are affected. The *Device Errors logged* field indicates the number of disk units for which detailed information is provided. Under the *Device* heading, the unit address, type, and serial number are provided for up to three disk units. Additionally, the controller type and serial number for each of these disk units indicates the adapter to which the disk was last attached when it was operational.
- Note:** You might find an entry for an xxxx902F SRC entry in the Product Activity Log when the array includes more than 10 disk units. To interpret the hexadecimal information for these additional disk units, see *More information from hexadecimal reports*.
16. Has the I/O card or have the devices been repaired or reconfigured recently?
- Yes:** Continue with the next step.
- No:** Contact your next level of support for assistance. **This ends the procedure.**
17. You can use one of the following repair options to correct the problem:
- Reunite the adapter and disk units identified in previous steps so that the cache data can be written to the disk units. If you can find the devices and adapters and want to continue with this repair option, then continue with the next step.
  - If the data for the disk units identified in previous steps is not needed on this or any other system, initialize and format these disk units.
- Attention:** This repair option causes a loss of customer data. If you want to continue with this repair option, go to step 19.
18. Perform the following:
- a. Restore the adapter and disk units back to their original configuration. For more information, see *System FRU locations*. After the system writes cache data to the disk units and you power off the system normally, you can move the adapter and disk units to another location.
  - b. Power on the system. For more information, see *Powering on and powering off the system*. Does the IP complete successfully?
- No:** Perform problem analysis to correct the new problem. **This ends the procedure.**
- Yes:** **This ends the procedure.**
19. You have chosen to initialize and format the identified disk units. Perform the following steps:
- Attention:** Performing the following steps causes a loss of customer data.
- a. If you are not already using dedicated service tools, perform an IPL to DST. For more information, see *Performing an IPL to dedicated service tools*. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
  - b. Select **Work with disk units**. Did you get to DST with a Type D IPL?
- Yes:** Continue with the next step.
- No:** Select **Work with disk unit recovery > Disk unit problem recovery procedures**, then continue with the next step.
20. Select **Initialize and format disk unit**.
21. Follow the online instructions to format and initialize the disk units.
22. Perform an IPL from disk. Does the IPL complete successfully?
- No:** Perform problem analysis and correct the new problem. **This ends the procedure.**
- Yes:** **This ends the procedure.**

## IOPIP31

Cache data associated with the attached devices cannot be found.

You were sent to this procedure from URC 9010.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Has the system been powered off for several days?
  - **No:** Go to step 4.
  - **Yes:** The cache battery pack may be depleted. Do NOT replace the I/O adapter or the cache battery pack. Reclaim the cache storage. See Reclaiming IOP cache storage. Then continue with the next step.

**Note:** When an auxiliary cache I/O adapter connected to the storage I/O adapter logs a 9055 SRC in the Product Activity Log, the Reclaim does not result in lost sectors. Otherwise, the Reclaim does result in lost sectors, and the system operator may want to restore data from the most recent saved tape after you complete the repair.

3. Does the IPL complete successfully?
  - No:** Contact your next level of support. **This ends the procedure.**
  - Yes:** **This ends the procedure.**
4. Are you working with a 571F/575B card set?
  - No:** Go to step 6.
  - Yes:** Continue with the next step.
5. Remove the 571F/575B card set. Create a new card set with the following:

**Note:** Label all parts (both original and new) before moving them.

- The **new** replacement 571F storage IOA
- The cache directory card from the **original** 571F storage IOA
- The **original** 575B auxiliary cache adapter

See Separating the 571F/575B card set and moving the cache directory card.

- Ensure that the SCSI cable and the battery power cable on the top edge of the storage side of the card are connected to the top edge of the auxiliary cache side of the card.
  - Reinstall this card set into the system and go to step 7.
6. Remove the I/O adapter. Install the **new** replacement storage I/O adapter with the following parts installed on it:

**Note:** Label all parts (both old and new) before moving them.

- The cache directory card from the **original** storage I/O adapter. On adapters with removable cache cards, the cache directory card will move with the removable cache card.
- The removable cache card from the **original** storage I/O adapter (this applies to only the 571E and some 2780 I/O adapters).

See System FRU locations.

- If the I/O adapter is attached to an auxiliary cache I/O adapter, ensure that the SCSI cable on the last port of the new replacement storage I/O adapter is connected to the auxiliary cache I/O adapter. For a list of auxiliary cache I/O adapters, see System parts.
7. Did the 9010 SRC that sent you to this procedure occur on a type-D IPL?
    - No:** Continue with the next step.
    - Yes:** Perform a type-D IPL and continue with the next step.

8. Has a new 9010 or 9050 SRC occurred in the Service Action Log?
  - No:** Go to step 11.
  - Yes:** Continue with the next step.
9. Was the new SRC 9050?
  - No:** Continue with the next step.
  - Yes:** Contact your next level of support. **This ends the procedure.**
10. The new SRC was 9010. Reclaim the cache storage. See Reclaiming IOP cache storage.
 

**Note:** When an auxiliary cache I/O adapter that is connected to the storage I/O adapter logs a 9055 SRC in the Product Activity Log, the reclaim does not result in lost sectors. Otherwise, the reclaim does result in lost sectors, and the system operator might want to restore data from the most recent saved tape after you complete the repair.
11. Are you working with a 571F/575B card set?
  - No:** Go to step 13.
  - Yes:** Continue with the next step.
12. Remove the 571F/575B card set. Create a new card set with the following:
  - The **new** 571F storage IOA
  - The cache directory card from the **new** 571F storage IOA
  - The **new** 575B auxiliary cache adapter

See Separating the 571F/575B card set and moving the cache directory card.

  - Ensure that the SCSI cable and the battery power cable on the top edge of the storage side of the card are connected to the top edge of the auxiliary cache side of the card.
  - Reinstall this card set into the system.

**This ends the procedure.**
13. Remove the I/O adapter. Install the **new** replacement storage I/O adapter that has the following parts installed on it:
  - The cache directory card from the **new** storage I/O adapter. On adapters with removable cache cards, the cache directory card will move with the removable cache card.
  - The removable cache card from the **new** storage I/O adapter (this applies to only the 571E and some 2780 I/O adapters).

See System FRU locations.

  - If the I/O adapter is attached to an auxiliary cache I/O adapter, ensure that the SCSI cable on the last port of the new replacement storage I/O adapter is connected to the auxiliary cache I/O adapter. For a list of auxiliary cache I/O adapters, see the System parts.

**This ends the procedure**

## IOPIP32

You were sent to this procedure from unit reference code (URC) 9011.

**Attention:** There is data in the cache of this I/O card, that belongs to devices other than those that are attached. Customer data may be lost.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Did you just exchange the storage I/O adapter as a result of a failure?
  - **No:** Continue with the next step.
  - **Yes:** Reclaim the cache storage. See Reclaiming IOP cache storage.

Does the IPL complete successfully?

**No:** You have a new problem. Perform problem analysis and correct the problem. **This ends the procedure.**

**Yes: This ends the procedure.**

3. Have the I/O cards been moved or reconfigured recently?

- **No:** Ask your next level of support for assistance. **This ends the procedure.**
- **Yes:** Perform the following steps:
  - a. Power off the system. See Powering on and powering off the system for details.
  - b. Restore all I/O cards to their original position.
  - c. Select the IPL type and mode that are used by the customer.
  - d. Power on the system.

Does the IPL complete successfully?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes: This ends the procedure.**

## IOPIP33

The I/O processor card detected a device configuration error. The configuration sectors on the device may be incompatible with the current I/O processor card.

You were sent to this procedure from unit reference code (URC) 9001.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to (Determine if the system has logical partitions) before continuing with this procedure.
2. Has the I/O adapter been replaced with a different type of I/O adapter, or have the devices been moved from a different type of I/O adapter to this one?
  - **No:** Contact your next level of support. **This ends the procedure.**
  - **Yes:** Continue with the next step.
3. Does the disk unit contain data that needs to be saved?
  - **Yes:** Continue with the next step.
  - **No:** Initialize and format the disk units.

**Attention:** Any data on the disk unit will be lost. Perform the following:

    - a. Access SST or DST.
    - b. Select **Work with disk units**.
    - c. Did you get to DST with a type D IPL?
      - **No:** Select **Work with disk unit recovery** → **Disk unit problem recovery procedures**. Then, continue with the next step.
      - **Yes:** Continue with the next step.
    - d. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display will show that the status is complete. This may take 30 minutes or longer.
    - e. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**
4. The disk unit contains data that needs to be saved.
  - If the I/O adapter has been replaced with a different type of I/O adapter, reinstall the original I/O adapter. Then continue with the next step.
  - If the disk units have been moved from a different type of I/O adapter to this one, return the disk units to their original I/O adapter. Then continue with the next step.
5. Stop parity protection on the disk units, and power down the system normally with the I/O adapter in an operational state. The I/O adapter or disk units can now be returned to the configuration at the beginning of this procedure. **This ends the procedure.**

## IOPIP34

You were sent to this procedure from unit reference code (URC) 9027.

The I/O processor card detected that an array is not functional due to the present hardware configuration.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to (Determine if the system has logical partitions) before continuing with this procedure.
2. Has the I/O adapter been replaced with a different I/O adapter, or have the devices been moved from a different I/O adapter to this one?
  - **No:** Perform (IOPIP22). **This ends the procedure.**
  - **Yes:** Perform the following:
    - a. Power off the system. See (Power on/off the system and logical partitions).
    - b. Restore all I/O cards or devices to their original position.
    - c. Power on the system.
3. Does the IPL complete successfully?
  - **No:** Ask your next level of support for assistance. **This ends the procedure.**
  - **Yes: This ends the procedure.**

## IOPIP40

Use this procedure to isolate the problem when a storage I/O adapter is connected to an incompatible or non-operational auxiliary cache I/O adapter.

Perform the following:

1. Are you working on a 571F/575B combination storage and auxiliary cache IOA card set (uses two card slot locations)?
  - **Yes:** Continue with step 2.
  - **No:** Continue with step 3.
2. Find the location of the card.
  - Use the location displayed in the Service Action Log. If the Service Action Log does not have a location, determine the address of the I/O adapter. See System Reference Code (SRC) Format Description.
  - The location identified is for the 571F side of the card set.

You must configure both the 571F and the 575B in the same partition. Are both the 571F side of the card set and the 575B side of the card set configured in the same partition?

- **Yes:** Replace the entire card set. See System FRU locations for information on FRU locations on the system that you are servicing. **This ends the procedure.**
  - **No:** Change the configuration so that the same partition controls both cards in the card set. **This ends the procedure.**
3. Ensure that the SCSI cable on the last port of the storage I/O adapter is connected to the auxiliary cache I/O adapter. Do the following:
    - a. Use the location of the storage I/O adapter displayed in the Service Action Log. If the Service Action Log does not have a location, determine the address of the storage I/O adapter. See System Reference Code (SRC) Format Description.
    - b. Determine the location of the storage I/O adapter. See System FRU locations for information on FRU locations on the system that you are servicing.
    - c. Ensure that the SCSI cable on the last port of the storage I/O adapter is properly connected to an auxiliary cache I/O adapter.

- d. Ensure that both the auxiliary cache I/O adapter and the storage I/O adapter are in the same partition.
  - e. Ensure that the slot power indicator is lit for the auxiliary cache I/O adapter. If it is not, use concurrent maintenance to power on the slot.
4. Ensure that the auxiliary cache I/O adapter is supported for the storage I/O adapter to which it is connected. See the PCI adapter installation instructions for information about which adapters are compatible.
  5. Replace the SCSI cable on the last port of the storage I/O adapter that connects to the auxiliary cache I/O adapter. See System FRU locations for information on FRU locations on the system that you are servicing. If this does not fix the problem, replace the auxiliary cache I/O adapter. **This ends the procedure.**

## IOPIP41

Use this procedure to correct the problem when an auxiliary cache I/O adapter is not connected to a storage I/O adapter or when an auxiliary cache I/O adapter is connected to an incompatible or non-operational storage I/O adapter.

Perform the following:

1. Are you working on a 571F/575B combination storage and auxiliary cache IOA card set (uses two card slot locations)?
  - **Yes:** Continue with step 2.
  - **No:** Continue with step 3.

2. Find the location of the card.

- Use the location displayed in the Service Action Log. If the Service Action Log does not have a location, determine the address of the I/O adapter. See System FRU locations.
- The location identified is for the 575B side of the card set.

You must configure both the 571F and the 575B in the same partition. Are both the 571F side of the card set and the 575B side of the card set configured in the same partition?

- **Yes:** Replace the entire card set. See System FRU locations for the model you are working on. **This ends the procedure.**
  - **No:** Change the configuration so that the same partition controls both cards in the card set. **This ends the procedure.**
3. Ensure that the SCSI cable of the auxiliary cache I/O adapter is connected to the last port of the storage I/O adapter. Do the following:
    - a. Use the location of the auxiliary cache I/O adapter displayed in the Service Action Log. If the Service Action Log does not have a location, determine the address of the auxiliary cache I/O adapter. See The System Reference Code (SRC) Format Description.
    - b. Determine the location of the auxiliary cache I/O adapter. See System FRU locations for the model you are working on.
    - c. Ensure that the SCSI cable of the auxiliary cache I/O adapter is properly connected to the last port of the storage I/O adapter.
    - d. Ensure that both the auxiliary cache I/O adapter and the storage I/O adapter are in the same partition.
    - e. Ensure that the slot power indicator is lit for the storage I/O adapter. If it is not, use concurrent maintenance to power on the slot.
  4. Did you just replace the auxiliary cache I/O adapter because of a failure and did the new replacement auxiliary cache I/O adapter log a 9073 URC?
    - **Yes:** The SCSI bus on the storage I/O adapter may be disabled as a result of the initial failure. Use Hardware Service Manager to re-IPL the storage I/O adapter that is connected to the new replacement auxiliary cache I/O adapter. **This ends the procedure.**

- **No:** Continue with the next step.
5. Ensure that the auxiliary cache I/O adapter is supported for the storage I/O adapter to which it is connected. See the PCI adapter installation instructions for information about which adapters are compatible.
  6. Replace the SCSI cable that connects the auxiliary cache I/O adapter to the storage I/O adapter. See System parts for cable part number information. If this does not fix the problem, replace the storage I/O adapter. **This ends the procedure.**

---

## Licensed internal code isolation procedures

Use this section to isolate licensed internal code problems.

Please read and observe all safety procedures before servicing the system and while performing a procedure.

**Attention:** Unless instructed otherwise, always power off the system or expansion tower where the FRU is located before removing, exchanging, or installing a field-replaceable unit (FRU).

## DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

## LICIP01

Licensed Internal Code detected an IOP programming problem.

You will need to gather data to determine the cause of the problem. If using **OptiConnect**, and the IOP is connected to another system, then collect this information from both systems. Read the "Licensed internal code isolation procedures" on page 99 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Is the system operational: Did the SRC come from the Service Action Log, Product Activity Log, problem log, or system operator message?
  - **No:** Go to step 9 on page 101.
  - **Yes:** Is this a x6xx5121 SRC?
    - No:** Continue with the next step.
    - Yes:** Go to step 4 on page 101.

3. If the IOP has DASD attached to it, then the IOP dump is in SID87 (or SID187 if the DASD is mirrored). Copy the IOP dump. See Storage dumps.
4. Print the Product Activity Log, including any IOP dumps, to removable media for the day which the problem occurred. Select the option to obtain HEX data.
5. Use the "Licensed Internal Code log" service function under DST/SST to copy the LIC log entries to removable media for the day that the problem occurred.
6. Copy the system configuration list. See System configuration list.
7. Provide the dumps to Service Support.
8. Check the Logical Hardware Resource STATUS field using Hardware Service Manager. If the status is not *Operational* then IPL the IOP using the I/O Debug option. Ignore resources with a status of *not connected*.  
 To IPL a failed IOP, the following command can be used: VRYCFG CFGOBJ(XXXX) CFGTYPE(\*CTL) STATUS(\*RESET) or use DST/SST Hardware Service Manager.  
 If the IPL does not work:
  - Check the Service Action Log for new SRC entries. See Searching the service action log. Use the new SRC and perform problem analysis to correct the problem.
  - If there are no new SRCs in the Service Action Log, contact your next level of support. **This ends the procedure.**
9. Has the system stopped but the DST console is still active: Did the SRC come from the Main Storage Dump manager screen on the DST console?  
 Yes: Continue with the next step.  
 No: Go to step 15.
10. Complete a Problem Summary Form using the information in words 1-9 from the control panel, or from the DST Main Storage Dump screen.
11. The system has already taken a partial main storage dump for this SRC and automatically re-IPLed to DST.
12. Copy the main storage dump to tape. See Storage dumps.
13. When the dump is completed, the system will re-IPL automatically. Sign on to DST or SST. Obtain the data in steps 3, 4, 5, and 6.
14. Provide the dumps to Service Support. **This ends the procedure.**
15. Has the system stopped with an SRC at the control panel?  
 Yes: Continue with the next step.  
 No: Go to step 2 on page 100.
16. Complete a Problem Summary Form using the information in words 1-9 from the control panel, or from the DST Main storage dump screen.
17. Do **NOT** power off the system. Perform a manual IPL to DST, and start the Main storage dump manager service function.
18. Copy the main storage dump to tape.
19. Obtain the data in steps 3, 4, 5, and 6.
20. Re-IPL the system.
21. Has the system stopped with an SRC at the control panel?  
 Yes: Using the new SRC, perform problem analysis to correct the problem. **This ends the procedure.**  
 No: Provide the dumps to Service Support. **This ends the procedure.**

## LICIP03

Dedicated service tools (DST) found a permanent program error, or a hardware failure occurred.

Read the danger notices in the “Licensed internal code isolation procedures” on page 99 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Does URC 50FF occur?
  - No:** Continue with the next step.
  - Yes:** Go to step 4.
3. Perform a main storage dump, then perform an IPL by doing the following:
  - a. Perform a main storage dump. See Storage dumps.
  - b. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to dedicated service tools .
  - c. When the IPL has completed, the system console should be at the DST display. Go to step 7. If the DST display does not appear on the system console, contact your next level of support.
4. Perform a main storage dump, then perform an IPL by doing the following:
  - a. Perform a main storage dump. See Storage dumps.
  - b. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to dedicated service tools .

Does a display appear?

**No:** Continue with the next step.

**Yes:** Go to step 7.

5. If the problem is in the logical partition, exchange the first workstation I/O processor card on bus 1. See Removing and replacing FRUs.
6. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to dedicated service tools .  
Is the IPL or Install the System display shown?
  - Yes:** Continue with the next step.
  - No:** Ask your next level of support for assistance and report the problem. **This ends the procedure.**
7. Copy the main storage dump to removable media. See Storage dumps.
8. Report a Licensed Internal Code problem to your next level of support. **This ends the procedure.**

## LICIP04

The initial program load (IPL) service function ended.

Dedicated service tools (DST) was in the disconnected status or lost communications with the IPL console because of a console failure and could not communicate with the user. Read the danger notices in “Licensed internal code isolation procedures” on page 99 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Select function **21** (Make DST Available) on the control panel and press **Enter** to start DST again.  
Does the DST Sign On display appear?
  - **No:** Continue with the next step.
  - **Yes:** Perform the following steps (see Dedicated service tools for details):
    - a. Select **Start a Service Tool** → **Licensed Internal Code log**.
    - b. Perform a dump of the Licensed Internal Code log to tape. See Start a service tool for details.
    - c. Return here and continue with the next step.
3. Perform a main storage dump. See Storage dumps for details.

4. Copy the main storage dump to removable media. See Storage dumps for details.
5. Report a Licensed Internal Code problem to your next level of support. **This ends the procedure.**

## LICIP07

The system detected a problem while communicating with a specific I/O processor.

The problem could be caused by Licensed Internal Code, the I/O processor card, or by bus hardware. Read the danger notices in “Licensed internal code isolation procedures” on page 99 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Did a previous procedure have you power off the system, perform an IPL in Manual mode, **and** is the system in Manual mode now?
  - **Yes:** Continue with the next step.
  - **No:** Perform the following steps:
    - a. Power off the system. See Powering on and powering off the system for details.
    - b. Select **Manual** mode on the control panel. See IPL type, mode, and speed options for details.
    - c. Power on the system.
    - d. Continue with the next step.
3. Does the SRC that sent you to this procedure appear on the control panel?
  - **No:** Continue with the next step.
  - **Yes:** Use the information in the SRC to determine the card direct select address. If the SRC is B6006910, you can use the last 8 characters of the top 16 character line of function 13 (word 7) to find the card direct select address in BBBBCcbb format.
 

**BBBB** Bus number  
**Cc** Card direct select address  
**bb** board address

Go to step 11 on page 104.
4. Does the console display indicate a problem with missing disks?
  - Yes:** Continue with the next step.
  - No:** Go to step 6.
5. Perform the following steps:
  - a. Go to the DST main menu.
  - b. On the DST sign-on display, enter the DST full authority user ID and password. See Dedicated service tools for details.
  - c. Select **Start a service tool** → **Hardware service manager**.
  - d. Check for the SRC in the service action log. See Searching the service action log.
 

Did you find the same SRC that sent you to this procedure?

    - **Yes:** Note the date and time for that SRC. Go to the Product Activity Log and search all logs to find the same SRC. When you have found the SRC, go to step 9 on page 104.
    - **No:** Perform the following steps:
      - 1) Return to the DST main menu.
      - 2) Perform an IPL and return to the Display Missing Disk Units display.
      - 3) Go to “LICIP11” on page 106. **This ends the procedure.**
6. Does the SRC that sent you to this procedure appear on the console or on the alternative console?
  - **Yes:** Continue with the next step.
  - **No:** Does the IPL complete successfully to the IPL or Install the System display?

**Yes:** Continue with the next step.

**No:** A different SRC occurred. Use the new SRC to correct the problem. **This ends the procedure.**

7. Perform the following:

- a. Use the full-authority password to sign on to DST.
- b. Search *All logs* in the product activity log looking for references of SRC B600 5209 and the SRC that sent you to this procedure.

**Note:** Search only for SRCs that occurred during the last IPL.

Did you find B600 5209 or the same SRC that sent you to this procedure?

- **Yes:** Go to step 10.

- **No:** Did you find a different SRC than the one that sent you to this procedure?

**Yes:** Continue with the next step.

**No:** The problem appears to be intermittent. Ask your next level of support for assistance. **This ends the procedure.**

8. Use the new SRC to correct the problem. **This ends the procedure.**

9. Use **F11** to move through alternative views of the log analysis displays until you find the card position and frame ID of the failing IOP associated with the SRC.

Was the card position and frame ID available, **and** did this information help you find the IOP?

**No:** Continue with the next step.

**Yes:** Go to step 12.

10. Perform the following steps:

- a. Display the report for the log entry of the SRC that sent you to this procedure.
- b. Display the additional information for the entry.
- c. If the SRC is B6006910, use characters 9-16 of the top 16 character line of function 13 (word 7) to find the card direct select address in BBBBCcbb format.

**BBBB** Bus number

**Cc** Card direct select address

**bb** board address

11. Use the BBBBCcbb information and refer to System FRU locations to determine the failing IOP and its location.

12. Go to "MABIP55" on page 53 to isolate an I/O adapter problem on the IOP you just identified. If this fails to isolate the problem, return here and continue with the next step.

13. Is the I/O processor card you identified in step 9 or step 11 the CFIOP?

- **No:** Continue with the next step.

- **Yes:** Perform the following steps:

- a. Exchange the failing CFIOP card. See System FRU locations.

**Note:** You will be prompted for the system serial number. Ignore any error messages regarding system configuration that appear during the IPL.

- b. Go to step 16 on page 105.

14. Perform the following steps:

- a. Power off the system.
- b. Remove the IOP card.
- c. Power on the system.

Does the SRC that sent you to this procedure appear on the control panel or appear as a new entry in the service action log or product activity log?

- **No:** Continue with the next step.

- **Yes:** Perform the following steps:
    - a. Power off the system.
    - b. Install the IOP card you just removed.
    - c. Replace the I/O backplane (Un-P1). **This ends the procedure.**
15. Perform the following steps:
- a. Power off the system.
  - b. Exchange the failing IOP card.
16. Power on the system.
- Does the SRC that sent you to this procedure appear on the control panel, on the console, or on the alternative console?
- No:** Continue with the next step.
- Yes:** Go to step 18.
17. Does a different SRC appear on the control panel, on the console, or on the alternative console?
- **Yes:** Use the new SRC to correct the problem. **This ends the procedure.**
  - **No:** On the IPL or Install the System display, check for the SRC in the service action log. See Searching the service action log for details.
- Did you find the same SRC that sent you to this procedure?
- Yes:** Continue with the next step.
- No:** Go to Verify a repair. **This ends the procedure.**
18. Perform the following steps:
- a. Power off the system.
  - b. Remove the IOP card you just exchanged and install the original card.
  - c. Go to (Bus-PIP1). **This ends the procedure.**
19. Ask your next level of support for assistance and report a Licensed Internal Code problem. You may be asked to verify that all PTFs have been applied.
- If you are asked to perform the following, see the following:
- Copy the main storage dump from disk to tape or diskette, see Storage dumps.
  - Print the product activity log, see Using the product activity log.
  - Copy the IOP storage dump to removable media, see Storage dumps. **This ends the procedure.**

## LICIP08

Licensed Internal Code detected an operating system program problem.

Read the danger notices in “Licensed internal code isolation procedures” on page 99 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to dedicated service tools .  
Does the same SRC occur?
  - **Yes:** Go to step 5 on page 106.
  - **No:** Does the same URC appear on the console?
 

**No:** Continue with the next step.

**Yes:** Go to step 4 on page 106.
3. Does a different SRC occur, or does a different URC appear on the console?
  - **Yes:** Use the new SRC or reference code to correct the problem. If the procedure for the new SRC sends you back to this procedure, then continue with the next step. **This ends the procedure.**

- **No:** Select **Perform an IPL** on the IPL or Install the System display to complete the IPL.

Is the problem intermittent?

**Yes:** Continue with the next step.

**No:** **This ends the procedure.**

4. Copy the main storage dump to removable media. See Storage dumps.
5. Report a Licensed Internal Code problem to your next level of support. **This ends the procedure.**

## LICIP11

Use this procedure to isolate a system **STARTUP** failure in the initial program load (IPL) mode.

Ensure you have read the danger notices in “Licensed internal code isolation procedures” on page 99 before continuing with this procedure.

### How to find the cause code

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions.
2. Were you given a cause code by another procedure?
  - No:** Continue with the next step.
  - Yes:** Use the cause code given by the other procedure. Then, go to step 4.
3. Look at the Data display characters in word 3. You can obtain these characters by either:
  - Looking at word 3 on the Problem summary form that was filled out earlier.
  - Selecting characters 9-16 of the top 16 character line of function 12 (word 3).
4. The 4 leftmost characters of word 3 represent the **cause code**. Select the cause code to go to the correct isolation instructions:

“0001”	“0010” on page 112	“0020” on page 114	“0031” on page 116
“0002” on page 107	“0011” on page 112	“0021” on page 114	“0033” on page 116
“0004” on page 110	“0012” on page 112	“0022” on page 115	“0034” on page 116
“0005” on page 110	“0015” on page 112	“0023” on page 115	“0035” on page 116
“0006” on page 110	“0016” on page 112	“0024” on page 115	“0037” on page 116
“0007” on page 110	“0017” on page 113	“0025” on page 115	“0099” on page 117
“0008” on page 110	“0018” on page 113	“0026” on page 115	
“0009” on page 111	“0019” on page 113	“0027” on page 116	
“000A” on page 111	“001A” on page 113		
“000B” on page 111	“001C” on page 114		
“000C” on page 111	“001D” on page 114		
“000D” on page 112	“001E” on page 114		
“000E” on page 112	“001F” on page 114		

## 0001

Disk configuration is missing.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools. Does the Disk Configuration Error Report display appear?

**Yes:** Continue with the next step.

**No:** The IPL completed successfully. **This ends the procedure.**

2. Is Missing Disk Configuration information displayed?
  - Yes:** Continue with the next step.
  - No:** Go to step 1 for cause code 0002.
3. On the Missing Disk Configuration display, perform the following:
  - a. Select option 5 → **Display Detailed Report** → **Work with disk units** → **Work with disk unit recovery** → **Recover Configuration**.
  - b. Follow the instructions on the display. After the disk configuration is recovered, the system automatically performs an IPL. **This ends the procedure.**

## 0002

Disk units are missing from the disk configuration.

Data from the control panel can be used to find information about the missing disk unit.

1. Did you enter this procedure because all the devices listed on the Display Missing Units display (reached from the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display) have a reference code of 0000?
  - No:** Continue with the next step.
  - Yes:** Go to step 20 on page 109.
2. Have you installed a new disk enclosure in a disk unit and not restored the data to the disk unit?
  - No:** Continue with the next step.
  - Yes:** Ignore SRC A600 5090. Continue with the disk unit exchange recovery procedure. **This ends the procedure.**
3. Use words 1-9 from the information recorded on the Problem summary form to determine the disk unit that is missing from the configuration:
  - Characters 1-8 of the bottom 16 character line of function 12 (word 4) contain the IOP direct select address.
  - Characters 1-8 of the top 16 character line of function 13 (word 6) contains the disk unit type, level and model number.
  - Characters 9-16 of the top 16 character line of function 13 (word 7) contains the disk unit serial number.

**Note:** For 2105 and 2107 disk units, the 5 rightmost characters of word 7 contain the disk unit serial number.

  - Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the number of missing disk units.

Are the problem disk units 432x, 433x, 660x, 671x, or 673x disk units?

  - No:** Continue with the next step.
  - Yes:** Go to step 5.
4. Attempt to get all devices attached to the MSIOP to Ready status by performing the following:
  - a. The MSIOP address (MSIOP Direct Select Address) to use is characters 1-8 of the bottom 16 character line of function 12 (word 4).
  - b. Verify the following and correct if necessary before continuing with step 10 on page 108.
    - All cable connections are made correctly and are tight.
    - All storage devices have the correct signal bus address, as indicated in the system configuration list.
    - All storage devices are powered on and ready.
5. Did you enter this procedure because there was an entry in the Service Action Log which has the reference code B6005090?

- Yes:** Continue with the next step.  
**No:** Go to step 10.
6. Are customer jobs running on the system now?  
**Yes:** Continue with the next step.  
**No:** Ensure that the customer is not running any jobs before continuing with this procedure. Then go to step 10.
7. Select **System Service Tools (SST) → Work with disk units → Display disk configuration → Display disk configuration status**.  
Are any disk units missing from the configuration (indicated by an asterisk \*)?  
**Yes:** Continue with the next step.  
**No: This ends the procedure.**
8. Do all of the disk units that are missing from the configuration have a status of "Suspended"?  
**Yes:** Continue with the next step.  
**No:** Ensure that the customer is not running any jobs before continuing with this procedure. Then go to step 10.
9. Use the Service Action Log to determine if there are any entries for the missing disk units (see Searching the service action log). Are there any entries in the Service Action Log for the missing disk units that were logged since the last IPL?  
**Yes:** Use the information in the Service Action Log, and Reference Code Finder). Perform the action indicated for the unit reference code. **This ends the procedure.**  
**No:** Go to step 21 on page 109.
10. Select **Manual** mode and perform an IPL to DST for the failing partition (see Performing an IPL to dedicated service tools ). Does the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear?  
**Yes:** Continue with the next step.  
**No:** The IPL completed successfully. **This ends the procedure.**
11. Does one of the following messages appear in the list?  
  - Missing disk units in the configuration
  - Missing mirror protected disk units in the configuration**Yes:** Continue with the next step.  
**No:** Go to step 16 on page 109.
12. Select option 5. Do the missing units have device parity protected status? (Device parity protection status is indicated by "DPY/" as the first four characters of the status.)  
**Yes:** Continue with the next step.  
**No:** Go to step 14.
13. Is the status DPY/Active?  
**Yes:** Continue with the next step.  
**No:** Use the Service Action Log to determine if there are any entries for the missing disk units or the IOA/IOP controlling them. See Searching the service action log for details. **This ends the procedure.**
14. Press **F11**, and press **Enter** to display the details.  
Do all of the disk units listed on the display have a reference code of 0000?  
**Yes:** Continue with the next step.  
**No:** Use the disk unit reference code shown on the display and Reference Code Finder. Perform the action indicated for the unit reference code. **This ends the procedure.**
15. Do all of the IOPs or devices listed on the display have a reference code of 0000?

**No:** Use the IOP reference code shown on the display and Reference Code Finder. Perform the action indicated for the reference code. **This ends the procedure.**

**Yes:** Go to step 20.

16. Does the following message appear in the list: Unknown load-source status?

**Yes:** Continue with the next step.

**No:** Go to step 18.

17. Select option 5, press **F11**, and then press **Enter** to display the details.

Does the Assign Missing Load Source Disk display appear?

**No:** Continue with the next step.

**Yes:** Press **Enter** to assign the missing load-source disk unit. **This ends the procedure.**

18. Does the following message appear in the list?

Load source failure

**Yes:** Continue with the next step.

**No:** The IPL completed successfully. **This ends the procedure.**

19. Select option 5, press **F11**, and then press **Enter** to display the details.

20. The number of failing disk unit facilities (actuators) is the number of disk units displayed. A disk unit has a *Unit* number greater than zero.

Find the failing disk unit by type, model, serial number, or address displayed on the console.

21. Is there more than one failing disk device attached to the IOA or MSIOP?

**Yes:** Continue with the next step.

**No:** Go to step 24.

22. Use the SAL to determine if there are any entries that occurred around the time of the A6xx/B6xx 5090 SRC. See Using the service action log. Are there any such entries?

**No:** Continue with the next step.

**Yes:** Use the information in the SAL and Reference Code Finder). Perform the action indicated for the unit reference code. **This ends the procedure.**

23. Are all the disk devices that are attached to the IOA or MSIOP failing? (If the disk units are using mirrored protection, select **Display Disk Status** to find out.)

**No:** Continue with the next step.

**Yes:** Go to step 25.

24. Go to the Reference Code Finder and exchange the FRUs shown one at a time. Then return here and answer the question below the listed disk units.

Disk Unit	SRC to look up
2105	21053002
2107	21073002
432x	432x3002
433x	433x3002
660x	660x3002
671x	671x3002
673x	673x3002

Did the disk unit service information correct the problem?

**No:** Continue with the next step.

**Yes: This ends the procedure.**

25. Exchange the IOA or MSIOP. See System FRU locations for information on FRU locations for the system you are servicing.

If exchanging the IOA or MSIOP did not correct the problem, use the original SRC and exchange the failing items, starting with the highest probable cause of failure. If the failing item list contains FI codes, Reference Code Finder to help determine parts and locations. **This ends the procedure.**

## 0004

Some disk units are unprotected but configured into a mirrored ASP. These units were originally DPY protected but protection was disabled.

Perform the following:

1. Is the system managed by an HMC?

**Yes:** Select **DST** by performing the HMC action for Function 21 for the failing partition. See Control panel functions on the HMC. Then continue with the next step.

**No:** Select **DST** using Function 21 for the failing partition. See Selecting function 21 from the control panel in Service functions. Then continue with the next step.

2. Select **Work with disk units** and take the actions to protect the system.

If you do not know what actions to take, select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.

When the Disk configuration error report appears, the recovery actions are listed in the Help text for the error message "Unprotected disk units in a mirrored ASP". **This ends the procedure.**

## 0005

A disk unit using parity protection is operating in exposed mode.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.
2. Choose from the following options:
  - If the same reference code appears, ask your next level of support for assistance.
  - If no reference code appears and the IPL completes successfully, the problem is corrected.
  - If a different reference code appears, use it to perform problem analysis and correct the new problem. **This ends the procedure.**

## 0006

There are new devices attached to the system that do not have Licensed Internal Code installed. Ask your next level of support for assistance.

## 0007

Some of the configured disk units have device parity protection disabled when the system expected device parity protection to be enabled.

1. Is the system managed by an HMC?

**Yes:** Select **DST** by performing the HMC action for Function 21 for the failing partition. See Control panel functions on the HMC. Then continue with the next step.

**No:** Select **DST** using Function 21 for the failing partition. See Selecting function 21 from the control panel in Service functions. Then continue with the next step.

2. Correct the problem by doing the following:

- a. Select **Work with disk units** → **Work with disk unit recovery** → **Correct device parity protection**.
- b. Follow the online instructions. **This ends the procedure.**

## 0008

A disk unit has no more alternate sectors to assign.

1. Determine the failing unit by type, model, serial number or address given in words 4-7. See The system reference code format description.
2. See the service information for the specific storage device. Use the disk unit reference code listed below for service information entry.

432x 102E, 433x 102E, 660x 102E, 671x 102E, 673x 102E ( Reference Code Finder).

**This ends the procedure.**

## 0009

The procedure to restore a disk unit from the tape unit did not complete. Continue with the disk unit exchange recovery procedure.

## 000A

There is a problem with a disk unit subsystem. As a result, there are missing disk units in the system.

Perform the following:

1. Is the system managed by an HMC?
  - Yes:** Select **DST** by performing the HMC action for Function 21 for the failing partition. See Control panel functions on the HMC. Then continue with the next step.
  - No:** Select **DST** using Function 21 for the failing partition. See Selecting function 21 from the control panel in Service functions. Then continue with the next step.
2. On the Service Tools display, select **Start a Service Tool** → **Product activity log** → **Analyze log**.
3. On the Select Subsystem Data display, select the option to view **All Logs**.

**Note:** You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.

4. Use the defaults on the Select Analysis Report Options display by pressing **Enter**.
5. Search the entries on the Log Analysis Report display for system reference codes associated with the missing disk units.
6. Go to Reference Code Finder to correct the problem. **This ends the procedure.**

## 000B

Some system IOPs require cache storage be reclaimed.

1. Is the system managed by an HMC?
  - Yes:** Select **DST** by performing the HMC action for Function 21 for the failing partition. See Control panel functions on the HMC. Then continue with the next step.
  - No:** Select **DST** using Function 21 for the failing partition. See Selecting function 21 from the control panel in Service functions. Then continue with the next step.
2. Reclaim the cache adapter card storage. See Reclaiming IOP cache storage.

**Note:** The system operator may want to restore data from the most recent saved tape after you complete the repair.

**This ends the procedure.**

## 000C

One of the mirror protected disk units has no more alternate sectors to assign.

1. Determine the failing unit by type, model, serial number or address given in words 4-7. See Service reference code information.

2. See the service information for the specific storage device. Use the disk unit reference code listed below for service information entry.

432x 102E, 433x 102E, 660x 102E, 671x 102E, 673x 102E ( Reference Code Finder).

**This ends the procedure.**

## 000D

The system disk capacity has been exceeded.

For more information about disk capacity, see *iSeries® Handbook*, GA19-5486-20.

## 000E

Start compression failure.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.
2. Correct the problem by doing the following:
  - a. Select **Work with disk units** → **Work with disk unit recovery** → **Recover from start compression failure**.
  - b. Follow the on-line instructions. **This ends the procedure.**

## 0010

The disk configuration has changed.

The operating system must be installed again, and all customer data must be restored.

1. Select **Manual** mode on the control panel.
2. Perform an IPL to reinstall the operating system.
3. The customer must restore all data from the latest system backup. **This ends the procedure.**

## 0011

The serial number of the control panel does not match the system serial number.

1. Select **Manual** mode on the control panel.
2. Perform an IPL. You will be prompted for the system serial number. **This ends the procedure.**

## 0012

The operation to write the vital product data (VPD) to the control panel failed.

Exchange the multiple function I/O processor card. See System FRU locations for information on FRU locations for the system that you are servicing.

## 0015

The mirrored load-source disk unit is missing from the disk configuration. Go to step 1 on page 107 for cause code 0002.

## 0016

A mirrored protected disk unit is missing. Wait six minutes. If the same reference code appears, go to step 1 on page 107 for cause code 0002.

## 0017

One or more disk units have a lower level of mirrored protection than originally configured.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.
2. Review the detailed display, which shows the new and the previous levels of mirrored protection. **This ends the procedure.**

## 0018

Load-source configuration problem. The load-source disk unit is using mirrored protection and is configured at an incorrect address. Ensure that the load-source disk unit is in device location 1.

## 0019

One or more disk units were formatted incorrectly.

The system will continue to operate normally. However, it will not operate at optimum performance. To repair the problem, perform the following:

1. Record the unit number and serial number of the disk unit that is formatted incorrectly.
2. Sign on to DST. See Accessing dedicated service tools.
3. Select **Work with disk units** → **Work with disk unit configuration** → **Remove unit from configuration**.
4. Select the disk unit you recorded earlier in this procedure.
5. Confirm the option to remove data from the disk unit. This step may take a long time because the data must be moved to other disk units in the auxiliary storage pool (ASP).
6. When the remove function is complete, select **Add unit to configuration**.
7. Select the disk unit you recorded earlier in this procedure.
8. Confirm the add. The disk unit is formatted during functional operation. **This ends the procedure.**

## 001A

The load-source disk unit data is down-level.

The load-source disk unit is mirror protected. The system is using the load-source disk unit that does not have the current level of data.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools. Does the Disk Configuration Error Report display appear?

**No:** The system is now using the correct load-source. **This ends the procedure.**

**Yes:** Continue with the next step.

2. Does a "Load source failure" message appear in the list?

**Yes:** Continue with the next step.

**No:** The system is now using the correct load-source. **This ends the procedure.**

3. Select option 5, press **F11**, and then press **Enter** to display details.

The load-source type, model, and serial number information that the system needs is displayed on the console.

Is the load-source disk unit (displayed on the console) attached to an MSIOP that cannot be used for a load-source?

**Yes:** Contact your next level of support. **This ends the procedure.**

**No:** The load-source disk unit is missing. Go to step 1 on page 107 for cause code 0002.

## 001C

The disk units that are needed to update the system configuration are missing.

Perform an IPL by doing the following:

1. Select **Manual** mode on the control panel.
2. Perform an IPL. Use the IPL information to determine the cause of the problem. **This ends the procedure.**

## 001D

1. Is the Disk Configuration Attention Report, or the Disk Configuration Warning Report displayed?

**Yes:** Continue with the next step.

**No:** Ask your next level of support for assistance. **This ends the procedure.**

2. On the Bad Load Source Configuration message line, select **5**, and press **Enter** to rebuild the load-source configuration information. If there are other types of warnings, select option **5** on the warnings, and correct the problem. **This ends the procedure.**

## 001E

The load-source data must be restored.

## 001F

Licensed Internal Code was installed on the wrong disk unit of the load-source mirrored pair.

The system performed an IPL on a load source that may not contain the same level of Licensed Internal Code that was installed on the other load source. The type, model, and address of the active device are displayed in words 4-7 of the SRC.

Choose from the following options:

1. If the load-source disk unit in position 1 contains the correct level of Licensed Internal Code, perform the following:
  - a. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools. Is the Disk Configuration Attention Report or Disk Configuration Warning Report displayed?

**Yes:** Select option **5** on the Incorrect Licensed Internal Code Install message line. When the Display Incorrect Licensed Internal Code Install display appears on the console, press **Enter**.

**No:** The system is now using the correct load source. **This ends the procedure.**
2. If the load-source disk unit in position 1 of the system unit does **not** contain the correct level of Licensed Internal Code, restore the Licensed Internal Code to the disk unit in position 1 of the system unit. **This ends the procedure.**

## 0020

The system appears to be a one disk unit system. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.

## 0021

The system password verification failed.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.
2. When prompted, enter the correct system password. If the correct system password is not available perform the following:

- a. Select **Bypass the system password**.
- b. Have the customer contact the marketing representative immediately to order a new system password from your service provider. **This ends the procedure.**

## 0022

A different compression status was expected on a reporting disk unit. Accept the warning. The reported compression status will be used as the current compression status.

## 0023

There is a problem with a disk unit subsystem. As a result, there are missing disk units in the system. The system is capable of IPLing in this state.

1. Is the system managed by an HMC?

**Yes:** Select **DST** by performing the HMC action for Function 21 for the failing partition. See Control panel functions on the HMC. Then continue with the next step.

**No:** Select **DST** using Function 21 for the failing partition. See Selecting function 21 from the control panel in Service functions. Then continue with the next step.

2. On the Service Tools display, select **Start a Service Tool** → **Product activity log** → **Analyze log**.
3. On the Select Subsystem Data display, select the option to view All Logs.

**Note:** You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.

4. Use the defaults on the Select Analysis Report Options display by pressing **Enter**.
5. Search the entries on the Log Analysis Report display for system reference codes associated with the missing disk units.
6. Go to the Reference Code Finder topic and use the SRC information to correct the problem. **This ends the procedure.**

## 0024

The system type or system unique ID needs to be entered.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.
2. When prompted, enter the correct system type or system unique ID. **This ends the procedure.**

## 0025

Hardware Resource Information Persistence disabled.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.
2. Contact your next level of support for instructions on how to enable the Hardware Resource Information Persistence function. **This ends the procedure.**

## 0026

A disk unit is incorrectly configured for an LPAR system.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.
2. On the Service Tools display, select **Start a Service Tool** → **Product activity log** → **Analyze log**.
3. On the Select Subsystem Data display, select the option to view All Logs.

**Note:** You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.

4. Use the defaults on the Select Analysis Report Options display by pressing **Enter**.
5. Search the entries on the Log Analysis Report display for system reference codes (B6xx 53xx) that are associated with the error.
6. Using the SRC information, Reference Code Finder and use the information to correct the problem.  
**This ends the procedure.**

## **0027**

The user ASP has overflowed. Contact your next level of support.

## **0031**

A problem was detected with the installation of Licensed Internal Code service displays. The cause may be defective media, the installation media being removed too early, a device problem or a Licensed Internal Code problem.

- Ask your next level of support for assistance. Characters 13-16 of the top 16 character line of function 12 (4 rightmost characters of word 3) contain information regarding the install error.
- If the customer does not require the service displays to be in the national language, you may be able to continue by performing another system IPL. **This ends the procedure.**

## **0033**

System model not supported. This model of hardware does not support the System Licensed Internal Code version and release that is being used. Use a supported version and release of the System Licensed Internal Code.

## **0034**

Insufficient main storage capacity.

There is not enough main storage capacity. For details about how much more capacity is required, see the "Insufficient Main Storage Capacity" screen, which is displayed when the system is IPLed in manual mode. Typically, this error occurs when you have moved memory between logical partitions, and one partition no longer has a sufficient amount of main storage.

## **0035**

Data from a User ASP has overflowed into the System ASP (ASP 1). There is not enough free space in the User ASP to move the overflowed data from the System ASP back into the User ASP. The system will continue to run in this condition, but if a disk failure in the System ASP causes the System ASP to be cleared, the data in the User ASP will also be cleared out.

You should delete some files or objects from the User ASP so that enough free space exists in the User ASP to allow the data that is overflowed into the System ASP to be moved back.

## **0037**

One or more functional connections to a disk unit in a multi-path environment have not been detected. The connections to the disk unit were established by running ESS Specialist. If you use the server in this state, you may cause a loss of data. You must ensure that all of the functional connections are still established between the disk and the Input/Output Adapters (IOAs) attached to this server and this logical partition. If there is an IOA which has a connection to the disk unit that has been moved to a different logical partition or different server, you should not continue with the IPL. Notify your next level of support.

## 0099

A Licensed Internal Code program error occurred. Ask your next level of support for assistance.

## LICIP12

Use this procedure to isolate an Independent Auxiliary Storage Pool (IASP) vary on failure.

Message CPDB8E0 occurred if the user attempted to vary on the IASP. Read the **Danger** notices in "Licensed internal code isolation procedures" on page 99 before continuing with this procedure.

### How to find the cause code

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Were you given a cause code by another procedure?
  - No:** Continue with the next step.
  - Yes:** Use the cause code given by the other procedure. Then go to step 4.
3. Look at the characters in word 3. You can obtain these characters by doing the following:
  - a. On the command line, enter the Start System Service Tools (**STRSST**) command. If you cannot get to SST, use function 21 to get to DST. Do not IPL the system to get to DST.
  - b. On the Start Service Tools Sign On display, type in a User ID with service authority and password.
  - c. Select **Start a Service Tool** → **Hardware Service Manager** → **Work with service action log**.
  - d. On the Select Timeframe display, change the From: Date and Time to a date and time prior to when the user attempted to vary on the IASP.
  - e. Search for a B6005094 system reference code that occurred at the time the user attempted to vary on the IASP. Display the failing item information for this entry.
  - f. Select the function key for **Additional details**.
  - g. The 4 leftmost characters of word 3 is the cause code to be used in this procedure.
4. Find the **cause code** below:

"0002"	"000A" on page 120	"002C" on page 120	"0030" on page 121
"0004" on page 119	"000B" on page 120	"002D" on page 120	"0032" on page 121
"0007" on page 119	"000D" on page 120	"002E" on page 120	"0099" on page 121
"0009" on page 119	"000E" on page 120	"002F" on page 121	

## 0002

Disk units are missing from the IASP disk configuration.

1. Have you installed a new disk enclosure in a disk unit and not restored the data to the disk unit?
  - **No:** Continue with the next step.
  - **Yes:** Ignore SRC A600 5094.  
Continue with the disk unit exchange recovery procedure. **This ends the procedure.**
2. Use words 1-9 from the information in the Service Action Log to determine the disk unit that is missing from the configuration:
  - Word 4 contains the IOP direct select address.
  - Word 5 contains the unit address.

- Word 6 contains the disk unit type, level and model number.
- Word 7 contains the disk unit serial number.
- Word 8 contains the number of missing disk units.

Are the problem disk units 432x, 660x, or 671x Disk Units?

- **Yes:** Continue with the next step.
  - **No:** Attempt to get all devices attached to the IOP to Ready status by performing the following:
    - a. The IOP address (IOP Direct Select Address) to use is Word 4.
    - b. Verify the following, and correct if necessary:
      - Ensure all cable connections are made correctly and are tight.
      - Ensure the configuration within the device is correct.
      - Ensure all storage devices are powered on and ready.
    - c. Continue with the next step.
3. Perform the following:  
 Select **System Service Tools (SST) → Work with disk units → Display disk configuration → Display disk configuration status.**
- Are any disk units missing-indicated with an asterisk (\*)- from the IASP configuration?
- Yes:** Continue with the next step.
  - No: This ends the procedure.**
4. Use the Service Action Log to determine if there are any entries other than B6xx 5094 for the missing disk units or the IOA or IOP that is controlling them. See Using the product activity log.
- Are there any entries in the Service Action Log other than B6xx 5094 for the missing disk units or the IOA or IOP that is controlling them?
- No:** Continue with the next step.
  - Yes:** Use the information in the Service Action Log to solve the problem. See Using the product activity log. **This ends the procedure.**
5. Did you enter this procedure because there was a B6xx 5094 cause code of 0030?
- **No:** Continue with the next step.
  - **Yes:** Work with the customer to recover the unknown configuration source disk unit.  
 Use a workstation with System i® Navigator installed to select the disk pool with the problem, and then select **Recover unknown configuration source** for this disk pool. **This ends the procedure.**
6. Use Hardware Service Manager to display logical resources connected to the IOP. See Hardware service manager.
7. Is every device attached to the IOP failing?
- **Yes:** Continue with the next step.
  - **No:** Are all of the disk units that are attached to one IOA missing?
    - **No:** Continue with the next step.
    - **Yes:** Exchange the IOA. Use the IOP direct select address and the first character of the unit address from step 2 on page 117 to find the location. See System FRU locations. **This ends the procedure.**
8. Is there more than one storage IOA attached to the IOP?
- **Yes:** Exchange the IOP. Use the IOP direct select address from step 2 on page 117 to find the location. See System FRU locations. **This ends the procedure.**
  - **No:** Go to step 10 on page 119.
9. Go to the service information for the specific disk unit that is listed below and perform the action indicated. Then return here and answer the following question.
- **2105 Disk Units:** Use SRC 3002 exchange the FRUs shown one at a time.

- **432x, 660x, 671x Disk Units:** Use SRC 3002 and exchange the FRUs shown one at a time.

Did the disk unit service information correct the problem?

**No:** Continue with the next step.

**Yes:** **This ends the procedure.**

10. Perform the following:

- a. Exchange the IOA. Use the IOP direct select address and the first character of the unit address from step 2 on page 117 to find the location. See System FRU locations.
- b. If exchanging the IOA does not correct the problem, exchange the IOP. Use the IOP direct select address from step 2 on page 117 to find the location. See System FRU locations.
- c. If exchanging the IOP does not correct the problem, exchange the failing items in the following FRU list starting with the first item in the list.
  - 1) FI01140
  - 2) System backplane
  - 3) FI00580
  - 4) AJDG301

**This ends the procedure.**

## 0004

Some disk units are unprotected but configured into a mirrored IASP. These units were originally DPY protected but protection was disabled.

Direct the customer to take the actions necessary to start protection on these disk units. **This ends the procedure.**

## 0007

Some of the configured disk units have device parity protection disabled when the system expected device parity protection to be enabled.

1. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to dedicated service tools .
2. Correct the problem by doing the following:
  - a. Select **Work with disk units** → **Work with disk unit recovery** → **Correct device parity protection mismatch**.
  - b. Follow the on-line instructions. **This ends the procedure.**

## 0008

A disk unit has no more alternate sectors to assign.

1. Determine the failing unit by type, model, serial number or address given in words 4-7. See The system reference code format description.
2. See the service information for the specific storage device. Use the disk unit reference code listed below for service information entry.

432x 102E, 660x 102E, 671x 102E **This ends the procedure.**

## 0009

The procedure to restore a disk unit from the tape unit did not complete.

Continue with the disk unit exchange recovery procedure. **This ends the procedure.**

## 000A

There is a problem with a disk unit subsystem. As a result, there are missing disk units in the system.

Use the Service Action Log to find system reference codes associated with the missing disk units by changing the From: Date and Time on the Select Timeframe display to a date and time prior to when the user attempted to vary on the IASP. For information on how to use the Service Action Log, see Searching the service action log. **This ends the procedure.**

## 000B

Some system IOPs require cache storage be reclaimed.

1. Start SST.
2. Reclaim the cache adapter card storage by performing the following:
  - a. Select **Work with disk units** → **Work with disk unit recovery** → **Reclaim IOP Cache Storage**.
  - b. Follow the on-line instructions to reclaim cache storage.
  - c. After you complete the repair, the system operator may want to restore data from the most recently saved tape. **This ends the procedure.**

## 000D

The system disk capacity has been exceeded.

For more information about disk capacity, see the *iSeries Handbook*. **This ends the procedure.**

## 000E

Start compression failure.

1. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to dedicated service tools .
2. Correct the problem by doing the following:
  - a. Select **Work with disk units** → **Work with disk unit recovery** → **Recover from start compression failure**.
  - b. Follow the on-line instructions. **This ends the procedure.**

## 002C

A Licensed Internal Code program error occurred.

Ask your next level of support for assistance. **This ends the procedure.**

## 002D

The IASP configuration source disk unit data is down-level.

The system is using the IASP configuration source disk unit that does **not** have the current level of data.

Work with the customer to recover the configuration. On a workstation with System i Navigator installed, select the disk pool with the problem, and then select **Recover configuration**. **This ends the procedure.**

## 002E

The Independent ASP is assigned to another system or a Licensed Internal Code program error occurred.

Work with the customer to check other systems to determine if the Independent ASP has been assigned to it. If the Independent ASP has not been assigned to another system, ask your next level of support for assistance. **This ends the procedure.**

## 002F

The system version and release are at a different level than the IASP version and release.

The system version and release must be upgraded to be the same as the system version and release in which the IASP was created. **This ends the procedure.**

## 0030

The mirrored IASP configuration source disk unit has a disk configuration status of *unknown* and is missing from the disk configuration.

Go to step 1 on page 117 for cause code 0002.

## 0032

A Licensed Internal Code program error occurred.

Ask your next level of support for assistance. **This ends the procedure.**

## 0099

A Licensed Internal Code program error occurred.

Ask your next level of support for assistance. **This ends the procedure.**

## LICIP13

A disk unit seems to have stopped communicating with the system.

The system has stopped normal operation until the cause of the disk unit failure is found and corrected. Ensure you have read the **Danger** notices in "Licensed internal code isolation procedures" on page 99 before continuing with this procedure.

If the disk unit that stopped communicating with the system has **mirrored protection active**, normal operation of the system stops for one to two minutes. Then the system suspends mirrored protection for that disk unit and continues normal operation.

**Note:** Do not power off the system or partition using the white button, function 08, ASMI, or HMC immediate power-off when performing this procedure. If this procedure or other isolation procedures referenced by this procedure direct you to IPL or power off the system,

- perform a partition main storage dump (see Performing dumps), or
  - if additional dump information is not needed, perform a function 03 IPL or restart the system or partition using the HMC.
1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
  2. Was a problem summary form completed for this problem?
    - No:** Continue with the next step.
    - Yes:** Use the problem summary form information and go to step 4 on page 122.
  3. Fill out a Problem Reporting Form ... completely with the instructions provided.

4. Recovery from a device command time-out may have caused the communications loss condition (indicated by an SRC on the control panel or in the HMC). This communications loss condition has the following symptoms:

- The A6xx SRC does not increment within two minutes.
- The system continues to run normally after it recovers from the communications loss condition and the reference code is cleared from the control panel.

Does the communication loss condition have the above symptoms?

**Yes:** Continue with the next step.

**No:** Go to step 6.

5. Verify that all Licensed Internal Code PTFs have been applied to the system. Apply any Licensed Internal Code PTFs that have not been applied to the system. Does the intermittent condition continue?

**Yes:** Print all product activity logs. Print the LIC logs with a major code of 1000. Provide this information to your next level of support. **This ends the procedure.**

**No:** **This ends the procedure.**

6. Is the storage hosted by another partition?

**Yes:** Contact your next level of support.

**No:** Continue with the next step.

7. A manual reset of the IOP may clear the attention reference code. Perform the following:

**If you are working from the control panel:**

- a. Select *Manual* mode on the control panel.
- b. Select **Function 25** and press Enter.
- c. Select **Function 26** and press Enter.
- d. Select **Function 67** and press Enter to reset the IOP.
- e. Wait 10 minutes.
- f. Select **Function 25** and press Enter to disable the service functions on the control panel.

**If you are working from the HMC:**

- a. These need to be updated for the new HMC UI...
- b. In the Navigation Area, open the Service Applications folder.
- c. Select **Service Focal Point**.
- d. In the contents area, select **Service Utilities**.
- e. In the Service Utilities window, select the system you are working on.
- f. Select **Selected** → **Operator Panel Service Functions**.
- g. Select the logical partition, and then select **Partition Functions**.
- h. Select **Disk Unit IOP Reset/Reload (67)**.
- i. Wait 10 minutes.

Did the reset successfully clear the control panel SRC or HMC panel value and can commands be entered on the partition console?

**No:** Continue with the next step.

**Yes:** Look for a Service Action Log (SAL) entry since the last IPL, and use it to fix the problem (see Searching the service action log). If a B6xx 5090 SRC occurred since the last IPL, look for other SRC entries and take action on them first. **This ends the procedure.**

8. Is the SRC the same reference code that sent you here?

**Yes:** The same reference code occurred. Continue with the next step.

**No:** Collect all words of the reference code and perform, problem analysis to resolve the new problem. **This ends the procedure.**

9. Powering off and powering on the affected IOP domain may clear the attention reference code. Perform the following:

**If you are working from the control panel:**

- a. Select *Manual* mode on the control panel.
- b. Select **Function 25** and press Enter.
- c. Select **Function 26** and press Enter.
- d. Select **Function 68** and press Enter to power off the domain.
- e. After the domain has been powered off or 10 minutes have passed, select **Function 69** and press Enter to power on the domain.
- f. Wait 10 minutes.
- g. Select **Function 25** and press Enter to disable the service functions on the control panel.

**If you are working from the HMC:**

- a. In the Navigation Area, open the Service Applications folder.
- b. Select **Service Focal Point**.
- c. In the contents area, select **Service Utilities**.
- d. In the Service Utilities window, select the system you are working on.
- e. Select **Selected** → **Operator Panel Service Functions**.
- f. Select the logical partition, and then select **Partition Functions**.
- g. Select **Power off domain (68)**.
- h. After the domain has been powered off or 10 minutes have passed, select **Power on domain (69)**.
- i. Wait 10 minutes.

Did this successfully clear the control panel SRC or HMC panel value, and can commands be entered on the partition console?

**No:** Continue with the next step.

**Yes:** Look for a SAL entry since the last IPL, and use it to fix the problem (see Searching the service action log). If a B6xx 5090 SRC occurred since the last IPL, look for other SRC entries and take action on them first. **This ends the procedure.**

10. Is the SRC the same reference code that sent you here?

**Yes:** The same reference code occurred. Continue with the next step.

**No:** Collect all words of the reference code and perform problem analysis to resolve the new problem. **This ends the procedure.**

11. Perform a main storage dump, then perform an IPL by performing the following:

**If you are working from the control panel:**

- a. Select *Manual* mode on the control panel.
- b. Select **Function 22** and press Enter to dump the main storage to the load-source disk unit.
- c. Wait for SRC A100 300x to occur, indicating that the dump is complete.
- d. Then perform an IPL to DST (see Performing an IPL to dedicated service tools ).

**If you are working from the HMC:**

- a. In the Navigation Area, open Server and Partition.
- b. Select **Server Management**.
- c. In the contents area, open the server on which the logical partition is located.
- d. Select **Partitions**.
- e. Right-click the logical partition profile and select **Restart Partition**.
- f. In the Restart Partition window, select the **Dump** restart option.

Does a different SRC occur, or does a display appear on the console showing reference codes?

**No:** Continue with the next step.

**Yes:** Perform problem analysis to correct the new problem. **This ends the procedure.**

12. Does the same reference code occur?
- **Yes:** Continue with the next step.
  - **No:** The problem is intermittent. Perform the following:
    - a. Print the system product activity log for the magnetic storage subsystem and print the LIC logs with a major code of 1000.
    - b. Copy the main storage dump to removable media (see Managing dumps).
    - c. Contact your next level of support and provide them with this information. **This ends the procedure.**
13. Are characters 7-8 of the top 16 character line of function 12 (2 rightmost characters of word 2) equal to 13 or 17?
- Yes:** Continue with the next step.  
**No:** Go to step 16.
14. Use the word 1 through 9 information recorded on the Problem summary form to determine the disk unit that stopped communicating with the system:
- Characters 9-16 of the top 16 character line of function 12 (word 3) contain the IOP direct select address.
  - Characters 1-8 of the bottom 16 character line of function 12 (word 4) contains the unit address.
  - Characters 1-8 of the top 16 character line of function 13 (word 6) may contain the disk unit type, level and model number.
  - Characters 13-16 of the top 16 character line of function 13 (4 rightmost characters of word 7) may contain the disk unit reference code.
  - Characters 1-8 of the bottom 16 character line of function 13 (word 8) may contain the disk unit serial number.
- Note:** For 2105 and 2107 disk units, characters 4-8 of the bottom 16 character line of function 13 (5 rightmost characters of word 8) contain the disk unit serial number.
15. Is the disk unit reference code 0000?
- **No:** Using the information from step 14, find the table for the indicated disk unit type. Perform problem analysis for the disk unit reference code. **This ends the procedure.**
  - **Yes:** Perform the following steps:
    - a. Determine the IOP type by using characters 9-12 of the bottom 16 character line of function 13 (4 leftmost characters of word 9).
    - b. Find the unit reference code table for the IOP type. Determine the unit reference code by using characters 13-16 of the bottom 16 character line of function 13 (4 rightmost characters of word 9).
    - c. Perform problem analysis for the unit reference code. **This ends the procedure.**
16. Are characters 7-8 of the top 16 character line of function 12 (the two rightmost characters of word 2) equal to 27?
- Yes:** Continue with the next step.  
**No:** Go to step 20 on page 125.
17. Use the word 1 through 9 information recorded on the Problem summary form to determine the disk unit that stopped communicating with the system:
- Characters 9-16 of the top 16 character line of function 12 (word 3) contain the IOP direct select address.
  - Characters 1-8 of the bottom 16 character line of function 12 (word 4) contains the disk unit address
  - Characters 9-16 of the bottom 16 character line of function 12 (word 5) contains the disk unit type, level and model number.

- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the disk unit serial number.

**Note:** For 2105 and 2107 Disk Units, characters 4-8 of the bottom 16 character line of function 13 (5 rightmost characters of word 8) contain the disk unit serial number.

- Characters 13-16 of the bottom 16 character line of function 13 (4 rightmost characters of word 9) contain the disk unit reference code.

18. Is the disk unit reference code 0000?

- **No:** Continue with the next step.
- **Yes:** Find the table for the indicated disk unit type. Then find unit reference code (URC) 3002 in the table, and exchange the FRUs for that URC, one at a time.

**Note:** Do not perform any other isolation procedures that are associated with URC 3002.

**This ends the procedure.**

19. Are characters 9-16 of the bottom 16 character line of function 13 (word 9) B6xx 51xx?

**Yes:** Using the B6xx table, perform problem analysis for the 51xx unit reference code. **This ends the procedure.**

**No:** Using the information from step 17 on page 124, find the table for the indicated disk unit type. Perform problem analysis for the disk unit reference code. **This ends the procedure.**

20. Are the 2 rightmost characters of word 2 on the Problem summary form equal to 62?

**No:** Use the information in characters 9-16 of the bottom 16 character line of function 13 (word 9) and use this information instead of the information in word 1 for the reference code. **This ends the procedure.**

**Yes:** Continue with the next step.

21. Are characters 9-16 of the top 16 character line of function 12 (word 3) equal to 00010004?

**Yes:** Continue with the next step.

**No:** Go to step 24.

22. Are characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) equal to 0000?

**No:** Continue with the next step.

**Yes:** Go to step 25 on page 126.

23. Note the following:

- Characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) contain the disk unit reference code.
- Characters 1-8 of the top 16 character line of function 13 (word 6) contains the disk unit address.
- Characters 9-16 of the top 16 character line of function 13 (word 7) contain the IOP direct select address.
- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the disk unit type, level and model number.

Find the table for the disk unit type (characters 1-4 of the bottom 16 character line of function 13 - 4 leftmost characters of word 8), and use characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) as the unit reference code. **This ends the procedure.**

24. Are characters 9-16 of the top 16 character line of function 12 (word 3) equal to 0002000D?

- **Yes:** Continue with the next step.
- **No:** Use the information in characters 9-16 of the bottom 16 character line of function 13 (word 9), instead of the information in word 1 for the reference code, and perform problem analysis.
  - Characters 1-8 of the top 16 character line of function 13 (word 6) may contain the disk unit address.

- Characters 9-16 of the top 16 character line of function 13 (word 7) may contain the IOP direct select address.
- Characters 1-8 of the bottom 16 character line of function 13 (word 8) may contain the disk unit type, level and model number. **This ends the procedure.**

25. Note the following:

- Characters 1-8 of the top 16 character line of function 13 (word 6) contains the disk unit address.
- Characters 9-16 of the top 16 character line of function 13 (word 7) contain the IOP direct select address.
- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the disk unit type, level and model number.

Find the table for the disk unit type (characters 1-4 of the bottom 16 character line of function 13 (4 leftmost characters of word 8) and use 3002 as the unit reference code. Exchange the FRUs for URC 3002 one at a time. **This ends the procedure.**

## LICIP14

Licensed Internal Code detected a card slot test failure.

1. Has the I/O adapter moved to a new card location?

**Yes:** Continue with the next step.

**No:** Go to step 4.

2. Perform one of the following, and then continue with the next step:

- Use the concurrent maintenance option in Hardware Service Manager in SST/DST to power off, remove, reinsert, and power on the I/O adapter.

OR

- Power off the system, remove and reinsert the I/O adapter. Then IPL the system.

3. Does the reference code occur again for this same I/O adapter?

- **Yes:** Continue with the next step.
- **No:** No further service action is needed.

**This ends the procedure.**

4. Move the I/O adapter to a different card location, that has no I/O processors in the PCI bridge set, by performing one of the following, and then continue with the next step:

- Use the concurrent maintenance option in Hardware Service Manager in SST/DST to power off, remove the I/O adapter, install the I/O adapter in a different card location, and power on the I/O adapter. OR

- Power off the system, remove the I/O adapter, install the I/O adapter in a different card location, and then IPL the system.

5. Does the same reference code occur again for this I/O adapter?

- **Yes:** Replace the I/O adapter.

**This ends the procedure.**

- **No:** Replace the backplane.

**This ends the procedure.**

## LICIP15

Use this procedure to help you recover from an initial program load (IPL) failure.

1. Is the system HMC-managed or managed by Integrated Virtualization Manager (IVM)?

**Yes:** Continue with the next step.

**No:** Go to step 4 on page 127.

2. Check the LPAR configuration to ensure that the load source and alternate load source devices are valid. Is the LPAR configuration correct?

**Yes:** Continue with the next step.

**No:** Correct the LPAR configuration problem. **This ends the procedure.**

3. Is the load source hosted by another partition?

**Yes:** Contact your next level of support.

**No:** Continue with the next step.

4. Did the failure occur when you were performing a type-D IPL?

- **No:** Go to step 10.

- **Yes:** Perform the following:

- a. Ensure that the device is ready and has valid install media.

- b. Ensure that the device has the correct SCSI address and that any cables are properly connected and terminated.

If a correction is made during the above checks, retry the IPL. If none of the above items resolve the problem, continue with the next step.

5. Are the load source and alternate load source devices controlled by the same I/O adapter, and does the load source disk unit have SLIC loaded on it?

**Yes:** Continue with the next step.

**No:** Go to step 7.

6. Perform a type-B IPL in manual mode. Does the same SRC occur?

- **No:** Continue with the next step.

- **Yes:** Replace the following items, one at a time, and retry the IPL until the problem is resolved (see System FRU locations):

- a. The I/O adapter controlling load source and alternate load source devices.

**Note:** The I/O adapter may be embedded on the system unit backplane.

- b. The common cable, if present, attached between both the load source and alternate load source and the controlling I/O adapter.

- c. If none of the items above resolve the problem, contact your next level of support. **This ends the procedure.**

7. Replace the following items, one at a time, and retry the type-D IPL until the problem is resolved (see System FRU locations):

- a. Media in the alternate load source device

- b. Device cables (if present)

- c. Media device

- d. Media backplane

- e. I/O adapter controlling the alternate load source device

**Note:** The I/O adapter may be embedded on the system unit backplane

- f. If the problem persists after replacing each of these parts, contact your next level of support. **This ends the procedure.**

8. You performed a type A or type B IPL. Is the load source I/O adapter a Fibre Channel adapter?

**Yes:** Continue with the next step.

**No:** Continue with step 10.

9. Perform a type-D IPL in manual mode to DST. Look for other SRCs and use them to resolve the problem. If there are no SRCs, or if the SRCs do not resolve the problem, perform the actions for the 2847 3100 SRC. **This ends the procedure.**

10. Is the device in a valid location (see System FRU locations)?

**Yes:** Continue with the next step.

**No:** Correct the device location problem and retry the IPL. If the problem persists, continue with the next step.

11. Perform a type-D IPL in manual mode to DST. Is the type-D IPL successful?

- **No:** Continue with the next step.
- **Yes:** Look for other SRCs and use them to resolve the problem. If there are no SRCs, or the SRCs do not resolve the problem, replace the following items, one at a time, until the problem is resolved (see System FRU locations):
  - a. Load source disk drive
  - b. Cables (if present)
  - c. Disk drive backplane
  - d. I/O adapter controlling the load source device

**Note:** The I/O adapter may be embedded on the system unit backplane

- e. Backplane that the I/O adapter is plugged into
- f. If the problem persists after replacing each of these parts, contact your next level of support.  
**This ends the procedure.**

12. The type-D IPL in manual mode to DST was not successful. Is the I/O adapter embedded on the system unit backplane?

**No:** Continue with the next step.

**Yes:** Replace the system unit backplane and retry the IPL. If the IPL still fails, contact your next level of support. **This ends the procedure.**

13. Are the load source and alternate load source controlled by the same I/O adapter?

**No:** Go to step 16.

**Yes:** Continue with the next step.

14. Replace the I/O adapter and perform a type-A or type-B IPL. Does the IPL complete successfully?

**Yes:** **This ends the procedure.**

**No:** Continue with the next step.

15. Perform a type-D IPL in manual mode to DST. Is the type-D IPL successful?

- **No:** Continue with the next step.
- **Yes:** Look for other SRCs and use them to resolve the problem. If there are no SRCs, or the SRCs do not resolve the problem, replace the following items, one at a time, until the problem is resolved (see System FRU locations):
  - a. Load source disk drive
  - b. Cables (if present)
  - c. Disk drive backplane
  - d. I/O adapter controlling the load source device

**Note:** The I/O adapter may be embedded on the system unit backplane

- e. Backplane that the I/O adapter and I/O processor are plugged into
- f. If the problem persists after replacing each of these parts, contact your next level of support.  
**This ends the procedure.**

16. Replace the backplane that the I/O adapter is plugged into and retry the IPL. If the IPL still fails, contact your next level of support. **This ends the procedure.**

## LICIP16

Use this procedure to identify an adapter that is operational but is not located in the same partition as its associated adapter.

An adapter identified that its associated adapter is operational but is not located in the same partition. Use this procedure to identify the serial number and then find the location of the associated adapter and reassign it so that both adapters are in the same partition. Note: If the associated adapter is located in a different IBM i partition, there might also be a B600690A logged against the associated adapter in that partition.

1. The adapter against which the B600690A is logged has identified that its associated adapter can not be found in this partition. Find the resource name that this error was logged against. This can be obtained from the Service Action Log (see "Using the Service Action Log"). Then, using the resource name, perform the following:
  - a. Access SST or DST.
  - b. Select **Start a Service Tool**.
  - c. Select **Hardware Service Manager**.
  - d. Select **Locate resource by resource name**.
  - e. Enter the resource name that this error was logged against.
  - f. Take the option to Display detail for the adapter.
2. The bottom of the resource detail screen displays any combination of the following information:

Attached storage IOA resource name. :  
Attached storage IOA serial number. :  
Attached storage IOA link status. . :

Or

Attached auxiliary IOA resource name:  
Attached auxiliary IOA serial number:  
Attached auxiliary IOA link status. :

Or

Remote storage IOA resource name. . :  
Remote storage IOA serial number. . :  
Remote storage IOA link status. . . :
3. Using the serial number information displayed for the Attached or Remote IOA, have the customer determine which partition currently owns the adapter with that serial number by using logical resource or VPD utilities in each of the partitions on the system. Note: The CCIN of the associated adapter is the first four characters of word 6 of the SRC.
4. Then, have the customer ensure that both adapters are owned by the same partition. For further assistance, the customer should contact their software service provider. **This ends the procedure.**

---

## Logical partition isolation procedure

Identify logical partition (LPAR) configuration conditions and the associated corrective actions.

### DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

## LPRIP01

Use this procedure to isolate the problem when LPAR configuration data does not match the current system configuration.

1. Is there **only one** B6005311 error logged, and is it against the load source device for the partition, in either the Primary or a secondary partition?
  - **Yes:** Is the reporting partition the Primary partition?
    - **Yes:** Continue with the next step.
    - **No:** Go to step 3 on page 131.
  - **No:** Go to step 4 on page 131.
2. Was the load source disk unit migrated from another partition within the same system?
  - **Yes:** Is this load source device intended to be the load source for the Primary partition?

- **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions** → **Recover configuration data** → **Accept load source disk unit**. **This ends the procedure.**
  - **No:** Power off the system. Return the original load source disk to the Primary partition and perform a system IPL. **This ends the procedure.**
  - **No:** The load source disk unit has not changed. Contact your next level of support. **This ends the procedure.**
3. The reporting partition is a secondary partition.  
Since the last IPL of the reporting partition, have one of the following occurred?
- Has the Primary partition time/date been moved backward to a time/date earlier than the previous setting?
  - Has the system serial number been changed?
  - Was the load source disk unit in this secondary partition, replaced intentionally with a load source from another system or another partition from the same system?
  - **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions** → **Recover configuration data** → **Accept load source disk unit**. **This ends the procedure.**
  - **No:** Contact your next level of support. **This ends the procedure.**
4. Are there **multiple** B600 5311 SRCs logged in the same partition?
- **Yes:** Continue with the next step.
  - **No:** None of the conditions in this procedure have been met, call your next level of support. **This ends the procedure.**
5. Is the resource for **one** of the B600 5311 SRCs the load source device and are **all** of the other B600 5311 entries for resources which are non-configured disk units?
- Note:** To determine if a disk unit is a non-configured disk unit, refer to the "Work with disk unit options" section in the "DST options" section of the "DST chapter" in the *iSeries Service Functions* information.
- **Yes:** Is the partition that is reporting the error the **Primary** partition?
    - **Yes:** Continue with the next step.
    - **No:** Go to step 7.
  - **No:** Go to step 8 on page 132.
6. Was the load source disk unit migrated from another partition within the same system?
- **Yes:** Is this load source device intended to be the load source for the Primary partition?
    - **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions** → **Recover configuration data** → **Accept load source disk unit**. **This ends the procedure.**
    - **No:** Power off the system. Return the original load source disk to the Primary partition and perform a system IPL. **This ends the procedure.**
  - **No:** The load source disk unit has not changed. Contact your next level of support. **This ends the procedure.**
7. The reporting partition is a secondary partition.  
Since the last IPL of the reporting partition, have one of the following occurred:
- Has the Primary partition time/date been moved backward to a time/date earlier than the previous setting?
  - Has the system serial number been changed?
  - Was the load source disk unit in this secondary partition, replaced intentionally with a load source from another system or another partition from the same system?

- **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions** → **Recover configuration data** → **Accept load source disk unit** **This ends the procedure.**
  - **No:** Contact your next level of support. **This ends the procedure.**
8. One or more B600 5311 SRCs have been logged in the same partition.  
Do all of the B600 5311 errors have a resource which is a non-configured disk unit in the partition?
- Note:** To determine if a disk unit is a non-configured disk unit, refer to the "Work with disk unit options" section in the "DST options" section of the "DST chapter" in the *iSeries Service Functions* information.
- **Yes:** Continue with the next step.
  - **No:** None of the conditions in this procedure have been met, call your next level of support. **This ends the procedure.**
9. Were any disk unit resources associated with the B600 5311 SRCs added to the partition, since the last IPL of this partition?
- **No:** Continue with the next step.
  - **Yes:** Perform the following to clear non-configured disk unit configuration data:
    - a. Go to SST/DST in the partition and select **Work with system partitions** → **Recover configuration data** → **Clear non-configured disk unit configuration data**.
    - b. Select each unit in the list which is new to the system and press **Enter**.
    - c. Continue the system IPL. **This ends the procedure.**
10. None of the resources that are associated with the B600 5311 SRCs are disk units that were added to the partition since the last IPL of the partition.  
Has a scratch install recently been performed on the partition that is reporting the error(s)?
- **No:** Continue with the next step.
  - **Yes:** Go to step 13.
11. If a scratch install was not performed, was the clear configuration data option recently used to discontinue LPAR use?
- **Yes:** Continue with the next step.
  - **No:** The **Clear configuration data** option was not used. Contact your next level of support. **This ends the procedure.**
12. Perform the following to clear non-configured disk unit configuration data:
- a. Go to SST/DST in the partition and select **Work with system partitions** → **Recover configuration data** → **Clear non-configured disk unit configuration data**.
  - b. Select each unit in the list which is new to the system and press **Enter**.
  - c. Continue the system IPL. **This ends the procedure.**
13. Was the load source device previously mirrored before the scratch install?
- **Yes:** Continue with the next step.
  - **No:** Go to step 15.
14. Perform the following to clear the old configuration data from the disk unit that was mirroring the old load source disk
- a. Go to SST/DST in the partition and select **Work with system partitions** → **Recover configuration data** → **Clear non-configured disk unit configuration data**.
  - b. Select the former load source mirror in the list and press **Enter**.
15. Is the Primary partition reporting the B600 5311 error(s)?
- **No:** **This ends the procedure.**
  - **Yes:** Does the customer want multiple partitions on the system?
    - **No:** **This ends the procedure.**

- **Yes:** Use the **Recover primary partition configuration data** option to retrieve the LPAR configuration data from other devices in the system.
  - a. Go to SST/DST in the primary partition and select **Work with system partitions** → **Recover configuration data** → **Recover primary partition configuration data**. The system will perform an automatic IPL.
  - b. Verify the information that appears.
    - The device should be a former load source device from a secondary partition.
    - The time and date should reflect a time when that partition was active. It should be more recent than the last change to the logical partition configuration. **This ends the procedure.**

---

## Operations console isolation procedures

These procedures help you to isolate a failure with the Operations Console.

### DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

### For direct cable only

The following symptoms can be caused by Operations Console failing to connect:

- SRC A600 5008
- The status in the Operations Console window remains "Connecting console".

The following symptoms can be caused by a defective remote control panel cable:

- Remote control panel (hung) System control panel functions.
- SRC 0000 DDDD with attention light on the system panel.
- Remote control panel accepts mode selections, however the system does not respond.
- The remote control panel does not function.
- The status in the Operations Console window remains "Connecting console".

The following safety notices apply throughout this section.

Read all safety procedures before servicing the system. Observe all safety procedures when performing a procedure. Unless instructed otherwise, always power off the system or expansion tower where the field-replaceable unit (FRU) is located before removing, exchanging, or installing a FRU.

## OPCIP03

Use this procedure to isolate a bringup failure with Operations Console.

### DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

Use this procedure to isolate an Operations Console bringup failure when the SRC on the panel is A6xx5008 or B6xx5008. If you are not using the Operations Console, see A6005004. This procedure only works with cable-connected and LAN configurations. It is not valid for dial connected configurations.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determine if the system has logical partitions before continuing with this procedure.
2. Is the SRC on the panel A6xx5008 or B6xx5008?
  - **No: This ends the procedure.**

- **Yes:** Are you connecting Operations Console using the ASYNC adapter?  
**Yes:** Continue with the next step.  
**No:** You are connecting using a LAN adapter. Go to step 6.
3. Are words 17, 18, and 19 all equal to 00000000?
    - **Yes:** Report the problem to your next level of support. **This ends the procedure.**
    - **No:** Is word 17 equal to 00000001?  
**No:** Continue with the next step.  
**Yes:** The ASYNC adapter was not detected. Ensure that the ASYNC adapter card is installed, or replace the IOA and try again. **This ends the procedure.**
  4. Is word 17 equal to 00000002?
    - **Yes:** On the ASYNC adapter card that was found, no cable was detected. Word 18 contains the card position. Locate the ASYNC adapter card in this card position, and ensure that the external cable is attached. Install or replace the external cable. **This ends the procedure.**
    - **No:** Is word 17 equal to 00000003?  
**No:** Continue with the next step.  
**Yes:** The cable that was detected does not have the correct cable ID. Word 18 contains the card position. Word 19 contains the cable ID. Locate the ASYNC adapter card in this card position, and verify that the correct cable is attached, or replace the cable. **This ends the procedure.**
  5. Is word 17 equal to 00000004?
    - No:** Report the problem to you next level of support. **This ends the procedure.**
    - Yes:** Operations Console failed to make a connection because the port is already being used. Word 18 contains the card position. Disconnect the active communications session and try using the resource again. **This ends the procedure.**
  6. Are words 13, 14 and 15 all equal to 00000000?
    - **Yes:** Report the problem to you next level of support. **This ends the procedure.**
    - **No:** Is word 13 equal to 00000002?  
**No:** Continue with the next step.  
**Yes:** The LAN hardware failed to activate. Replace the LAN IOA being used. **This ends the procedure.**
  7. Is word 13 equal to 00000003?
    - **No:** Continue with the next step.
    - **Yes:** A hardware error occurred. Word 14 contains the error code, (example: 53001A80). Word 15 contains the card position.  
 Is the error code equal to 53001A80?  
**Yes:** The network cable is not attached to the LAN adapter, the cable is defective, or the network is not operational. **This ends the procedure.**  
**No:** The LAN adapter hardware is not operational. Replace the hardware and try again. **This ends the procedure.**
  8. Is word 13 equal to 00000004?
    - **Yes:** The console did not respond. Word 14 contains the number of attempts made. Word 15 contains the card position. The system is inserted into the network but there is no connection to the client (PC). Verify the configuration for the network at the system and client; verify the configuration of Operations Console. **This ends the procedure.**
    - **No:** Is word 13 equal to 00000005?  
**No:** Report the problem to your next level support. **This ends the procedure.**  
**Yes:** IP information was received from the console. Word 14 contains the received IP address. Verify the configuration data for the client (PC) or verify the configuration for the network. **This ends the procedure.**

---

## Power isolation procedures

Use power isolation procedures for isolating a problem in the power system. Use isolation procedures if there is no HMC attached to the server. If the server is connected to an HMC, use the procedures that are available on the HMC to continue FRU isolation.

Some field replaceable units (FRUs) can be replaced with the unit powered on. Follow the instructions in System FRU locations when directed to remove, exchange, or install a FRU.

The following safety notices apply throughout the power isolation procedures. Read all safety procedures before servicing the system and observe all safety procedures when performing a procedure.

### DANGER

**When working on or around the system, observe the following precautions:**

**Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:**

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

**To Disconnect:**

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

**To Connect:**

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

## Power problems

Use the following table to learn how to begin analyzing a power problem.

Table 29. Analyzing power problems

Symptom	What you should do
System unit does not power on.	See "Cannot power on system unit."
The processor or I/O expansion unit does not power off.	See "Cannot power off system or SPCN-controlled I/O expansion unit" on page 141.
The system does not remain powered on during a loss of incoming ac voltage and has an uninterruptible power supply (UPS) installed.	Refer to the UPS user's guide that was provided with your unit.
An I/O expansion unit does not power on.	See "Cannot power on SPCN-controlled I/O expansion unit" on page 145.

## Cannot power on system unit

Perform this procedure until you correct the problem and you can power on the system.

For important safety information before continuing with this procedure, see "Power isolation procedures" on page 137.

1. Attempt to power on the system. Refer to Powering on and powering off the system for information on powering on or off your system. Does the system power on, and is the system power status indicator light on continuously?

**Note:** The system power status indicator blinks at the slower rate (one blink per two seconds) while powered off, and at the faster rate (one blink per second) during a normal power-on sequence.

**No:** Continue with the next step.

**Yes:** Go to step 18 on page 141.

2. Are there any characters displayed on the control panel (a scrolling dot may be visible as a character)?

**No:** Continue with the next step.

**Yes:** Go to step 5.

3. Are the mainline ac power cables from the power supply, power distribution unit, or external uninterruptible power supply (UPS) to the customer's ac power outlet connected and seated correctly at both ends?

**Yes:** Continue with the next step.

**No:** Connect the mainline ac power cables correctly at both ends and go to step 1.

4. Perform the following:

- a. Verify that the UPS is powered on (if it is installed). If the UPS will not power on, follow the service procedures for the UPS to ensure proper line voltage and UPS operation.
- b. Disconnect the mainline ac power cable or ac power jumper cable from the system's ac power connector at the system.
- c. Use a multimeter to measure the ac voltage at the system end of the mainline ac power cable or ac power jumper cable.

**Note:** Some system models have more than one mainline ac power cable or ac power jumper cable. For these models, disconnect all the mainline ac power cables or ac power jumper cables and measure the ac voltage at each cable before continuing with the next step.

Is the ac voltage from 200 V ac to 240 V ac, or from 100 V ac to 127 V ac?

**No:** Go to step 13 on page 140.

**Yes:** Continue with the next step.

5. Perform the following:

- a. Disconnect the mainline ac power cable(s) from the power outlet.

- b. Exchange the system unit control panel (Un-D1). See System FRU locations.
- c. Reconnect the mainline ac power cables to the power outlet.
- d. Attempt to power on the system.

Does the system power on?

**No:** Continue with the next step.

**Yes:** The system unit control panel was the failing item. **This ends the procedure.**

6. Perform the following:

- a. Disconnect the mainline ac power cable(s) from the power outlet.
- b. Exchange the power supply or supplies (Un-E1, Un-E2). See System FRU locations.
- c. Reconnect the mainline ac power cables to the power outlet.
- d. Attempt to power on the system. See Powering on and powering off the system .

Does the system power on?

**No:** Continue with the next step.

**Yes:** The power supply was the failing item. **This ends the procedure.**

7. Is the system an 8234-EMA, 9117-MMA, 9406-MMA?

**No:** Go to step 12.

**Yes:** Continue with the next step.

8. Perform the following:

- a. Disconnect the mainline ac power cable(s).
- b. Replace the service processor card in the primary processor enclosure.
- c. Reconnect the mainline ac power cables to the power outlet.
- d. Attempt to power on the system. Does the system power on?

**No:** Continue with the next step.

**Yes:** The service processor card was the failing item. **This ends the procedure.**

9. Perform the following:

- a. Disconnect the mainline ac power cable(s).
- b. Replace the service processor card in the first secondary processor enclosure.
- c. Reconnect the mainline ac power cables to the power outlet.
- d. Attempt to power on the system. Does the system power on?

**No:** Continue with the next step.

**Yes:** The service processor card was the failing item. This ends the procedure.

10. Perform the following:

- a. Disconnect the mainline ac power cable(s).
- b. Replace the I/O backplane in the primary processor enclosure.
- c. Reconnect the mainline ac power cables to the power outlet.
- d. Attempt to power on the system. Does the system power on?

**No:** Continue with the next step.

**Yes:** The I/O backplane was the failing item. **This ends the procedure.**

11. Perform the following:

- a. Disconnect the mainline ac power cable(s).
- b. Replace the I/O backplane in the first secondary processor enclosure.
- c. Reconnect the mainline ac power cables to the power outlet.
- d. Attempt to power on the system. Does the system power on?

**No:** Contact your next level of support.

**Yes:** The I/O backplane was the failing item. **This ends the procedure.**

12. Perform the following:

- a. Disconnect the mainline ac power cable(s).
- b. Replace the system backplane (Un-P1). See System FRU locations.
- c. Reconnect the mainline ac power cables to the power outlet.
- d. Attempt to power on the system.

Does the system power on?

**No:** Continue with the next step.

**Yes:** The system backplane was the failing item. **This ends the procedure.**

13. Are you working on a system unit with a power distribution unit with tripped breakers?

- **No:** Continue with the next step.
- **Yes:** Perform the following:
  - a. Reset the tripped power distribution breaker.
  - b. Verify that the removable ac power cable is not the problem. Replace the cord, as installed, if it is defective.
  - c. If the breaker continues to trip, install a new power supply (as installed) in each location until the defective one is found. **This ends the procedure.**

14. Does the system have an external UPS installed?

**Yes:** Continue with the next step.

**No:** Go to step 16.

15. Use a multimeter to measure the ac voltage at the external UPS outlets. Is the ac voltage from 200 V ac to 240 V or from 100 V ac to 127 V ac?

**No:** The UPS needs service. For 9910 type UPS, call IBM Service Support. For all other UPS types, have the customer call the UPS provider. In the meantime, go to step 17 to bypass the UPS.

**Yes:** Exchange the ac power cable, as installed. See System parts for FRU part number. **This ends the procedure.**

16. Perform the following:

- a. Disconnect the mainline ac power cable from the customer's ac power outlet.
- b. Use a multimeter to measure the ac voltage at the customer's ac power outlet.

**Note:** Some system models have more than one mainline ac power cable. For these models, disconnect all the mainline ac power cables and measure the ac voltage at all ac power outlets before continuing with this step.

Is the ac voltage from 200 V ac to 240 V ac or from 100 V ac to 127 V ac?

**Yes:** Exchange the mainline ac power cable. See System parts for the FRU part number. Then go to step 1 on page 138.

**No:** Inform the customer that the ac voltage at the power outlet is not correct. When the ac voltage at the power outlet is correct, reconnect the mainline ac power cables to the power outlet. **This ends the procedure.**

17. Perform the following to bypass the UPS unit:

- a. Power off your system and the UPS unit.
- b. Remove the signal cable used between the UPS and the system.
- c. Remove any power jumper cords used between the UPS and the attached devices.
- d. Remove the country or region-specific power cord used from the UPS to the wall outlet.

- e. Use the correct power cord (the original country or region-specific power cord that was provided with your system) and connect it to the power inlet on the system. Plug the other end of this cord into a compatible wall outlet.
- f. Attempt to power on the system.

Does the power-on standby sequence complete successfully?

**Yes:** Go to Verify a repair. **This ends the procedure.**

**No:** Go to step 5 on page 138.

18. Display the selected IPL mode on the system unit control panel. See 'IPL information' in PC IPL Status. Is the selected mode the same mode that the customer was using when the power-on failure occurred?

**No:** Go to step 20.

**Yes:** Continue with the next step.

19. Is a function 11 reference code displayed on the system unit control panel?

**No:** Go to step 21.

**Yes:** Return to Start of Call. **This ends the procedure.**

20. Perform the following:

- a. Power off the system. See Powering on and powering off the system for information on powering on and off your system.
- b. Select the mode on the system unit control panel that the customer was using when the power-on failure occurred.
- c. Attempt to power on the system.

Does the system power on?

**Yes:** Continue with the next step.

**No:** Exchange the system unit control panel (Un-D1). See System FRU locations. **This ends the procedure.**

21. Continue the IPL. Does the IPL complete successfully?

**Yes:** **This ends the procedure.**

**No:** Return to Start of Call. **This ends the procedure.**

### **Cannot power off system or SPCN-controlled I/O expansion unit**

Use this procedure to analyze a failure of the normal command and control panel procedures to power off the system unit or an SPCN-controlled I/O expansion unit.

**Attention:** To prevent loss of data, ask the customer to verify that no interactive jobs are running before you perform this procedure.

For important safety information before continuing with this procedure, see "Power isolation procedures" on page 137.

1. Is the power off problem on the system unit?

**No:** Continue with the next step.

**Yes:** Go to step 3.

2. Ensure that the SPCN cables that connect the units are connected and seated correctly at both ends. Does the I/O unit power off, and is the power indicator light blinking slowly?

**Yes:** **This ends the procedure.**

**No:** Go to step 7 on page 142.

3. Attempt to power off the system. Does the system unit power off, and is the power indicator light blinking slowly?

**No:** Continue with the next step.

- Yes:** The system is not responding to normal power off procedures which could indicate a Licensed Internal Code problem. Contact your next level of support. **This ends the procedure.**
4. Attempt to power off the system using ASMI. Does the system power off?
 

**Yes:** The system is not responding to normal power off procedures which could indicate a Licensed Internal Code problem. Contact your next level of support. **This ends the procedure.**

**No:** Continue with the next step.
  5. Attempt to power off the system using the control panel power button. Does the system power off?
 

**Yes:** Continue with the next step.

**No:** Go to step 10.
  6. Is there a reference code logged in either ASMI, the control panel, or the HMC that indicates a power problem?
 

**Yes:** Perform problem analysis for the reference code in the log. **This ends the procedure.**

**No:** Contact your next level of support. **This ends the procedure.**
  7. Is the I/O expansion unit that will not power off part of a shared I/O tower loop?
 

**Yes:** Go to step 9.

**No:** Continue with the next step.
  8. Attempt to power off the I/O expansion unit. Were you able to power off the expansion unit?
 

**Yes: This ends the procedure.**

**No:** Go to step 10.
  9. The unit will only power off under certain conditions:
    - If the unit is in private mode, it should power off with the system unit that is connected by the SPCN frame-to-frame cable.
    - If the unit is in switchable mode, it should power off if the "owning" system is powered off or is powering off, and the system unit that is connected by the SPCN frame-to-frame cable is powered off or is powering off.

Does the I/O expansion unit power off?

**No:** Continue with the next step.

**Yes: This ends the procedure.**
  10. Ensure there are no jobs running on the system or partition, and verify that an uninterruptible power supply (UPS) is not powering the system or I/O expansion unit. Then continue with the next step.
  11. Perform the following:
    - a. Remove the system or I/O expansion unit ac power cord from the external UPS or, if an external UPS is not installed, from the customer's ac power outlet. If the system or I/O expansion unit has more than one ac line cord, disconnect all the ac line cords.
    - b. Exchange the following FRUs one at a time. See System FRU locations and System parts for information on FRU locations and parts for the system that you are servicing.
 

If the system unit is failing:

      - 1) Power supply (Un-E1 or Un-E2). Go to step 12 on page 143
      - 2) For 8203-E4A, 9407-M15, 9408-M25, (8204-E8A, and 9409-M5,0 exchange the system backplane (Un-P1). For 8234-EMA, 8234-EMA, 9117-MMA, and 9406-MMA exchange the service processor (Un-P1-C10). If that does not resolve the problem, exchange the I/O backplane (Un-P1).
      - 3) System control panel (Un-D1)

If an I/O expansion unit is failing:

      - 1) Each power supply. Go to step 12 on page 143
      - 2) I/O backplane
      - 3) I/O backplane in the unit preceding the unit that will not power off

4) SPCN frame-to-frame cable

**This ends the procedure.**

12. A power supply might be the failing item.

**Attention:** When replacing a redundant power supply, a 1xxx 1504, 1514, 1524, or 1534 reference code may be logged in the error log. If you just removed and replaced the power supply in the location associated with this reference code, and the power supply came ready after the install, disregard this reference code. If you had not previously removed and replaced a power supply, the power supply did not come ready after installation, or there are repeated fan fault errors after the power supply replacement, continue to follow these steps.

Is the reference code 1xxx-15xx?

**No:** Continue with the next step.

**Yes:** Perform the following:

- a. Find the unit reference code in one of the following tables to determine the failing power supply.
- b. Ensure that the power cables are properly connected and seated.
- c. Is the reference code 1xxx-1500, 1510, 1520, or 1530 and is the failing unit configured with a redundant power supply option (or dual line cord feature)?
  - **Yes:** Perform “PWR1911” on page 164 before replacing parts.
  - **No:** Continue with step 12d
- d. Refer to System FRU locations for information on FRU locations for the system that you are servicing.
- e. Replace the failing power supply (see the following tables to determine which power supply to replace).
- f. If the new power supply does not fix the problem, perform the following :
  - 1) Reinstall the original power supply.
  - 2) Try the new power supply in each of the other positions listed in the table.
  - 3) If the problem still is not fixed, reinstall the original power supply and go to the next FRU in the list.
  - 4) For reference codes 1xxx-1500, 1510, 1520, and 1530, exchange the power distribution backplane if a problem persists after replacing the power supply.

Table 30. System Unit

Unit Reference Code	Power Supply
1510, 1511, 1512, 1513, 1514, 7110	E1
1520, 1521, 1522, 1523, 1524, 7120	E2

**Attention:** For reference codes 1500, 1510, 1520, and 1530, perform “PWR1911” on page 164 before replacing parts.

Table 31. 5088, 0588 expansion units

Unit Reference Code	Power Supply
1510, 1511, 1512, 1513, 1514, 1516	P02
1520, 1521, 1522, 1523, 1524, 1526	P01

**Attention:** On a dual line cord system, for reference codes 1500, 1510, 1520, and 1530, perform “PWR1911” on page 164 before replacing parts. On a single line cord system, check the ac jumper to the power supply before replacing parts.

Table 32. 5094, 5294 I/O expansion units (single line cord)

Unit Reference Code	Power Supply
1510, 1511, 1512, 1513, 1514, 1516	P01
1520, 1521, 1522, 1523, 1524, 1526	P02
1530, 1531, 1532, 1533, 1534, 1536	P03

**Attention:** On a dual line cord system, for reference codes 1500, 1510, 1520, and 1530, perform “PWR1911” on page 164 before replacing parts. On a single line cord system, check the ac jumper to the power supply before replacing parts.

**Attention:** For 5094, 5294 expansion units, do not install power supplies P00 and P01 ac jumper cables on the same ac input module.

Table 33. 5094, 5294 I/O expansion units (dual line cord)

Unit Reference Code	Power Supply
1500, 1501, 1502, 1503	P00
1510, 1511, 1512, 1513, 1514, 1516	P01
1520, 1521, 1522, 1523, 1524, 1526	P02
1530, 1531, 1532, 1533	P03

Table 34. 5095, 0595, 5790, 7311-D11, 7311-D20, 7314-G30 expansion units

Unit Reference Code	Power Supply
1510, 1511, 1512, 1513, 1514, 1516, 1517	P01/E1
1520, 1521, 1522, 1523, 1524, 1526, 1527	P02/E2

**This ends the procedure.**

13. Is the reference code 1xxx-2600, 2603, 2605, or 2606?
- **No:** Continue with the next step.
  - **Yes:** Perform the following:
    - a. Refer to System FRU locations for information on FRU locations for the system you are servicing.
    - b. Replace the failing power supply.
    - c. Perform the following if the new power supply does not fix the problem:
      - 1) Reinstall the original power supply.
      - 2) Try the new power supply in each of the other positions listed in the table.
      - 3) If the problem still is not fixed, reinstall the original power supply and go to the next FRU in the list.

**Attention:** Do not install power supplies P00 and P01 ac jumper cables on the same ac input module.

Table 35. Failing power supplies

System or Feature Code	Failing Power Supply
System unit	Un-E1, Un-E2
5094, 5294 (single line cord)	P01, P02, P03
5094, 5294 (dual line cord)	P00, P01, P02, P03
5088, 0588	P02, P01
5095, 0595	P01, P02

Table 35. Failing power supplies (continued)

System or Feature Code	Failing Power Supply
5790, 7311-D11, 7311-D20, 7314-G30	E1, E2

**This ends the procedure.**

14. Is the reference code 1xxx 8455 or 8456?

- **No:** Return to Start of Call. **This ends the procedure.**
- **Yes:** One of the power supplies is missing, and must be installed. Use the following table to determine which power supply is missing, and install the power supply. See System FRU locations for information on FRU location for the system you are servicing.

Table 36. Missing power supplies

Reference Code	Missing Power Supply
1xxx 8455	Un-E1
1xxx 8456	Un-E2

**This ends the procedure.**

### Cannot power on SPCN-controlled I/O expansion unit

You are here because an SPCN-controlled I/O expansion unit cannot be powered on, and might be displaying a 1xxx-C62E reference code.

For important safety information before continuing with this procedure, see “Power isolation procedures” on page 137.

1. Power on the system.
2. Starting from SPCN 0 or SPCN 1 on the system unit. See System FRU locations, then go to the first unit in the SPCN frame-to-frame cable sequence that does not power on. Is the Data display background light on, or is the power-on LED blinking, or are there any characters displayed on the I/O expansion unit display panel?

**Note:** The background light is a dim yellow light in the Data area of the display panel.

**Yes:** Go to step 12 on page 147.

**No:** Continue with the next step.

3. Use a multimeter to measure the ac voltage at the customer’s ac power outlet.

Is the ac voltage from 200 V ac to 240 V ac, or from 100 V ac to 127 V ac?

- **Yes:** Continue with the next step.
- **No:** Inform the customer that the ac voltage at the power outlet is not correct.

**This ends the procedure.**

4. Is the mainline ac power cable from the ac module, power supply, or power distribution unit to the customer’s ac power outlet connected and seated correctly at both ends?

- **Yes:** Continue with the next step.
- **No:** Connect the mainline ac power cable correctly at both ends.

**This ends the procedure.**

5. Perform the following:

- a. Disconnect the mainline ac power cable from the ac module, power supply, or power distribution unit.
- b. Use a multimeter to measure the ac voltage at the ac module, power supply, or power distribution unit end of the mainline ac power cable.

Is the ac voltage from 200 V ac to 240 V ac, or from 100 V ac to 127 V ac?

**No:** Continue with the next step.

**Yes:** Go to step 7.

6. Are you working on a power distribution unit with tripped breakers?

- **No:** Exchange the mainline ac power cable or power distribution unit (as installed).

**This ends the procedure.**

- **Yes:** Perform the following:

- a. Reset the tripped power distribution breaker.
- b. Verify that the removable ac line cord is not the problem. Replace the cord, as installed, if it is defective.
- c. Install a new power supply (as installed) in all power locations until the defective one is found.

**This ends the procedure.**

7. Does the unit you are working on have ac power jumper cables installed?

**Note:** The ac power jumper cables connect from the ac module, or the power distribution unit to the power supplies.

**Yes:** Continue with the next step.

**No:** Go to step 11 on page 147.

8. Are the ac power jumper cables connected and seated correctly at both ends?

- **Yes:** Continue with the next step.
- **No:** Connect the ac power jumper cables correctly at both ends.

**This ends the procedure.**

9. Perform the following:

- a. Disconnect the ac power jumper cables from the ac module, or power distribution unit.
- b. Use a multimeter to measure the ac voltage at the ac module or power distribution unit (that goes to the power supplies).

Is the ac voltage at the ac module or power distribution unit from 200 V ac to 240 V ac, or from 100 V ac to 127 V ac?

- **Yes:** Continue with the next step.
- **No:** Exchange the following as they are installed. See System parts):
  - ac module
  - Power distribution unit

**This ends the procedure.**

10. Perform the following:

- a. Connect the ac power jumper cables to the ac module, or power distribution unit.
- b. Disconnect the ac power jumper cable at the power supplies.
- c. Use a multimeter to measure the voltage of the power jumper cables input to the power supplies.

Is the voltage 200 V ac to 240 V ac or 100 V ac to 127 V ac for each power jumper cable?

- **No:** Exchange the power jumper cable.

**This ends the procedure.**

- **Yes:** Exchange the following parts, as installed, one at a time:

- a. One of the FRUs listed in the following table, according to the enclosure:

Table 37. Enclosures FRU to be exchanged

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly

Table 37. Enclosures FRU to be exchanged (continued)

Enclosure	FRU
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

- b. Display unit
- c. Power supply 1
- d. Power supply 2
- e. Power supply 3

**This ends the procedure.**

11. Perform the following:
  - a. Disconnect the mainline ac power cable (to the expansion unit) from the customer's ac power outlet.
  - b. Exchange the following FRUs, one at a time:
    - Power supply.
    - One of the FRUs listed in the following table, according to the enclosure:

Table 38. Enclosures FRU to be exchanged

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

- c. Reconnect the mainline ac power cables (from the expansion unit) into the power outlet.
- d. Attempt to power on the system.

Does the expansion unit power on?

- **Yes:** The unit you exchanged was the failing item.

**This ends the procedure.**

- **No:** Repeat this step and exchange the next FRU in the list. If you have exchanged all of the FRUs in the list, ask your next level of support for assistance.

**This ends the procedure.**

12. Is there a reference code displayed on the display panel for the I/O unit that does not power on?
  - **Yes:** Continue with the next step.
  - **No:** Replace the FRU listed in the following table, according to the enclosure:

Table 39. Enclosures FRU to be exchanged

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

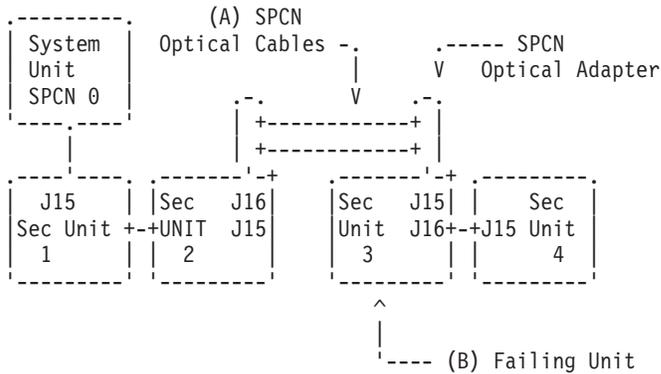
**This ends the procedure.**

13. Is the reference code 1xxx xx2E?

- **Yes:** Continue with the next step.
- **No:** Use the new reference code and return to Start of Call.

**This ends the procedure.**

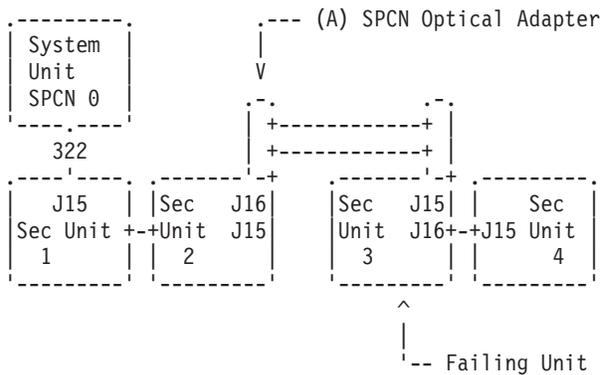
14. Do the SPCN optical cables (A) connect the failing unit (B) to the preceding unit in the chain or loop?



**Yes:** Continue with the next step.

**No:** Go to step 18 on page 149.

15. Remove the SPCN optical adapter (A) from the preceding frame in the string that cannot become powered on.



16. Perform the following:

**Notes:**

- a. The cable may be connected to either J15 or J16.
- b. Use an insulated probe or jumper when performing the voltage readings.
- a. Connect the negative lead of a multimeter to the system frame ground.
- b. Connect the positive lead of a multimeter to pin 2 of the connector from which you removed the SPCN optical adapter in the previous step of this procedure.
- c. Note the voltage reading on pin 2.
- d. Move the positive lead of the multimeter to pin 3 of the connector or SPCN card.
- e. Note the voltage reading on pin 3.

Is the voltage on both pin 2 and pin 3 from 1.5 V dc to 5.5 V dc?

- **Yes:** Continue with the next step.

- **No:** Exchange the FRU listed in the following table, according to the enclosure:

Table 40. Enclosures FRU to be exchanged

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

**This ends the procedure.**

17. Exchange the following FRUs, one at a time:

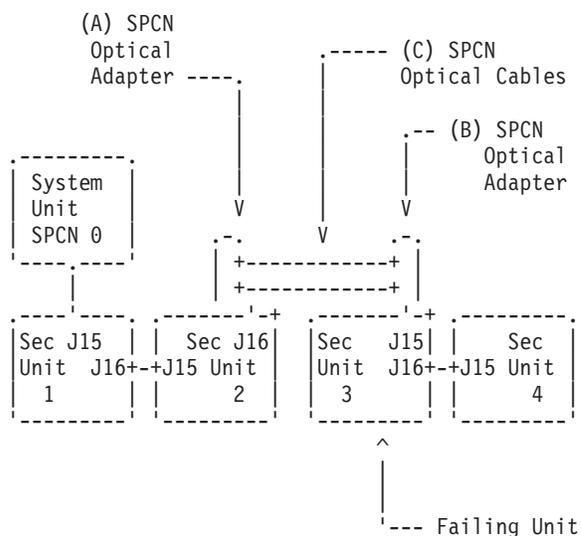
- In the failing unit (first frame with a failure indication), replace the following:

Table 41. Enclosures FRU to be exchanged

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

- In the preceding unit in the string, replace the FRU in Table 41.
- SPCN optical adapter (A) in the preceding unit in the string.
- SPCN optical adapter (B) in the failing unit.
- SPCN optical cables (C) between the preceding unit in the string and the failing unit.

**This ends the procedure.**



18. Perform the following:

- Power off the system.
- Disconnect the SPCN frame-to-frame cable from the connector of the first unit that cannot be powered on.
- Connect the negative lead of a multimeter to the system frame ground.

- d. Connect the positive lead of the multimeter to pin 2 of the SPCN cable.

**Note:** Use an insulated probe or jumper when performing the voltage readings.

- e. Note the voltage reading on pin 2.
- f. Move the positive lead of the multimeter to pin 3 of the SPCN cable.
- g. Note the voltage reading on pin 3.

Is the voltage on both pin 2 and pin 3 from 1.5 V dc to 5.5 V dc?

- **No:** Continue with the next step.
- **Yes:** Exchange the following FRUs one at a time:
  - a. In the failing unit, replace the FRU listed in the following table:

*Table 42. Enclosures FRU to be exchanged*

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

- b. In the preceding unit in the string, replace the FRU in Table 42.
- c. SPCN frame-to-frame cable.

**This ends the procedure.**

- 19. Perform the following:
  - a. Follow the SPCN frame-to-frame cable back to the preceding unit in the string.
  - b. Disconnect the SPCN cable from the connector.
  - c. Connect the negative lead of a multimeter to the system frame ground.
  - d. Connect the positive lead of a multimeter to pin 2 of the connector.

**Note:** Use an insulated probe or jumper when performing the voltage readings.

- e. Note the voltage reading on pin 2.
- f. Move the positive lead of the multimeter to pin 3 of the connector.
- g. Note the voltage reading on pin 3.

Is the voltage on both pin 2 and pin 3 from 1.5 V dc to 5.5 V dc?

- **Yes:** Exchange the following FRUs one at a time:
  - a. SPCN frame-to-frame cable.
  - b. In the failing unit, replace the following:

*Table 43. Enclosures FRU to be exchanged*

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

- c. In the preceding unit in the string, replace the FRU in Table 43.

**This ends the procedure.**

- **No:** Exchange the FRU in Table 43 on page 150 from the unit from which you disconnected the SPCN cable in the previous step of this procedure.

**This ends the procedure.**

## PWR1900

Determine which procedure to use based on the model number.

Follow the instructions for the model or expansion unit you are servicing.

Perform isolation procedure “PWR1905” on page 154 when servicing a 8203-E4A, 8204-E8A, 9407-M15, 9408-M25, or 9409-M50.

Perform isolation procedure “PWR1904” when servicing a 9406-MMA.

Perform isolation procedure “PWR1906” on page 156 when servicing a 5094 or 5096 expansion unit.

Perform isolation procedure “PWR1908” on page 160 when servicing a 5088 or 0588 expansion unit.

Perform isolation procedure “PWR1909” on page 162 when servicing a 5095, 0595, 5790, 5796, 5802 and 5877

7314-G30, 7311-D11, or 7311-D20 expansion units,

**This ends the procedure.**

## PWR1904

A power supply or regulator overcurrent fault is occurring in the server.

Refer to “Power isolation procedures” on page 137 for important safety information before servicing the system.

### Instructions for Model MMA

1. Is the reference code 1xxx 1C10, 1C11, 1C12, 1C13, 1C14, or 1C15?
  - Yes:** Continue with the next step.
  - No:** Go to step 5 on page 152.
2. Is the reference code 1xxx 1C10, 1C11, 1C13, 1C14, or 1C15?
  - No:** Continue with the next step.
  - Yes:** Go to step 4.
3. Perform the following:
  - a. Power off the system.
  - b. Replace one of the memory DIMMs on the processor cards. See System FRU locations for information on FRU locations for the system that you are servicing.
  - c. Power on the system. See Powering on and powering off the system .
  - d. Has this resolved the problem?
    - No:** Continue with step 3e.
    - Yes: This ends the procedure.**
  - e. Have you replaced all of the DIMMs?
    - No:** Repeat step 3 and replace the next memory DIMM.
    - Yes:** Go to step 4.
4. Perform the following:
  - a. Power off the system. See Powering on and powering off the system .
  - b. Replace one of the processor cards. For 1xxx 1C11 or 1C15, start with processor card 2. See System FRU locations for information on FRU locations for the system you are servicing.
  - c. Power on the system.

- d. Has this resolved the problem?  
**No:** Continue with step 4e.  
**Yes: This ends the procedure.**
- e. Have you replaced all of the processor cards?  
**No:** Repeat step 4 on page 151 and replace the next processor card.  
**Yes:** Go to step 8.
5. Perform the following:
- Power off the system and disconnect the ac power cable from the unit you are working on.
  - Disconnect all of the I/O devices (tape, diskette, optical, and disk units) from the unit you are working on by sliding them partially out of the unit.
  - Remove and label all cards (for example, PCI adapters, memory DIMMs, GX adapter(s), RIO/HSL and RAID cards if installed).
  - Reconnect the ac power cable to the unit you are working on.
  - Power on the system.
- Does a power reference code occur?  
**Yes:** Continue with the next step.  
**No:** Go to step 10 on page 153.
6. Perform the following:
- Power off the system. See Powering on and powering off the system .
  - Replace one of the system fans. See System FRU locations for information on FRU locations for the system that you are servicing.
  - Power on the system. See
- Does a power reference code occur?
- Yes:** Continue with the next step.
  - No:** The fan you just replaced was the failing item.  
**This ends the procedure.**
7. Have you tried replacing all of the fans?
- Yes:** Reinstall all of the fans you replaced in step 6 and continue with the next step.
  - No:** Perform the following:
    - Power off the system.
    - Reinstall the fan that you just removed in step 6 to its original location.
    - Repeat step 6.
8. Perform the following:
- Power off the system.
  - Replace one of the voltage regulator cards. See System FRU locations for the voltage regulator card location for the system you are servicing.
  - Power on the system.
- Does a power reference code occur?
- Yes:** Continue with the next step.
  - No:** The voltage regulator card you just replaced was the failing item.  
**This ends the procedure.**
9. Have you tried replacing all of the voltage regulator cards?
- Yes:** Replace the regulator distribution connection backplane P2. See System FRU locations for the regulator distribution connection backplane location for the system you are servicing. **This ends the procedure.**
  - No:** Perform the following:

- a. Power off the system. See Powering on and powering off the system .
  - b. Reinstall the voltage regulator card that you just removed in step 8 on page 152 to its original location.
  - c. Repeat step 8 on page 152.
10. Perform the following:
- a. Power off the system. See Powering on and powering off the system .
  - b. Reinstall all of the cards (PCI adapters, memory DIMMs, GX adapter(s), RIO/HSL and RAID cards ) you removed in step 5 on page 152 to their original locations.
  - c. Power on the system. See Powering on and powering off the system .
- Does a power reference code occur?
- Yes:** Continue with the next step.
- No:** Go to step 13.
11. Perform the following:
- a. Power off the system. See Powering on and powering off the system .
  - b. Disconnect one of the cards you reinstalled in step 10.
  - c. Power on the system.
- Does a power reference code occur?
- Yes:** Continue with the next step.
- No:** Exchange the last card you disconnected in this step (see System FRU locations). **This ends the procedure.**
12. Have you disconnected all of the cards?
- No:** Repeat step 11.
- Yes:** Reinstall all of the parts you have removed or exchanged in this procedure and perform problem analysis using the reference code. **This ends the procedure.**
13. Perform the following:
- a. Power off the system. See Powering on and powering off the system
  - b. Reconnect all of the I/O devices (tape, diskette, optical, and disk units) that you disconnected in step 5 on page 152.
  - c. Power on the system. See Powering on and powering off the system
- Does a power reference code occur?
- Yes:** Continue with the next step.
- No:** The problem has been resolved. **This ends the procedure.**
14. Perform the following:
- a. Power off the system. See Powering on and powering off the system
  - b. Disconnect one of the I/O devices (tape, diskette, optical, and disk units) that you reconnected in step 13.
  - c. Power on the system. See Powering on and powering off the system
- Does a power reference code occur?
- Yes:** Continue with the next step.
- No:** Exchange the last I/O device you disconnected in this step (see System FRU locations). **This ends the procedure.**
15. Have you tried disconnecting all of the I/O devices?
- No:** Repeat step 14.
- Yes:** Reinstall all of the parts you have removed or exchanged in this procedure and contact your next level of support. **This ends the procedure.**

## PWR1905

A system unit power supply load fault is occurring.

Refer to “Power isolation procedures” on page 137 for important safety information before servicing the system.

### Instructions for Models 8203-E4A, 8204-E8A, 9407-M15, 9408-M25, or 9409-M50

1. Is the reference code 1xxx 1B01?

**Yes:** Continue with the next step.

**No:** This procedure only isolates problems that cause 1xxx 1B01 to be logged. Return to the procedure that sent you here. **This ends the procedure.**

2. Perform the following:

- a. Power off the system and disconnect the ac power cable from the unit you are working on. See Powering on and powering off the system .
- b. Disconnect all the I/O devices (tape, diskette, optical, and disk units) by sliding them partially out of the system unit. See System FRU locations for information on system FRU parts, locations and addresses.
- c. Remove and label all cards (for example, PCI adapters, GX adapter(s), RIO/HSL, and RAID cards if installed).
- d. Reconnect the ac power cable or cables to the unit you are working on.
- e. Power on the system. See Powering on and powering off the system for information on powering on or off your system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 5.

3. Perform the following:

- a. Power off the system. See Powering on and powering off the system .
- b. Replace one of the system fans. See System FRU locations Finding parts, locations, and addresses for information on system fan locations for the system you are servicing..
- c. Power on the system. See Powering on and powering off the system for information on powering on or off your system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The fan you just replaced was the failing item. **This ends the procedure.**

4. Have you tried replacing all the fans?

- **Yes:** Reinstall the fan you just replaced in step 3 and continue with the next step.
- **No:** Perform the following:
  - a. Power off the system.
  - b. Reinstall the fan that you just removed in step 3 to its original location.
  - c. Repeat step 3

5. Perform the following:

- a. Power off the system.
- b. Reinstall all the cards (PCI adapters, memory DIMMs, GX adapter(s), RIO/HSL and RAID cards) you removed in step 2 into their original locations.
- c. Power on the system. See Powering on and powering off the system .

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 8 on page 155.

6. Perform the following:
  - a. Power off the system. See Powering on and powering off the system .
  - b. Disconnect one of the cards you reinstalled in step 5 on page 154.
  - c. Power on the system. See Powering on and powering off the system .Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Exchange the last card you disconnected in this step. See System FRU locations for information on FRU locations for the system you are servicing. **This ends the procedure.**
7. Have you disconnected all the cards?

**No:** Repeat step 6.

**Yes:** Reinstall all of the parts removed or exchanged in this procedure and return to Start of Call. **This ends the procedure.**
8. Perform the following:
  - a. Power off the system. See Powering on and powering off the system .
  - b. Reconnect all of the I/O devices (tape, diskette, optical, and disk units) that you disconnected in step 2 on page 154.
  - c. Power on the system. See Powering on and powering off the system .Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The problem has been resolved. **This ends the procedure.**
9. Perform the following:
  - a. Power off the system. See Powering on and powering off the system .
  - b. Disconnect one of the I/O devices (tape, diskette, optical, and disk units) that you reconnected in step 8.
  - c. Power on the system. See Powering on and powering off the system .Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Exchange the last I/O device you disconnected in this step. See System FRU locations for information on the I/O device location for the system you are servicing. **This ends the procedure.**
10. Have you tried disconnecting all of the I/O devices?

**No:** Repeat step 9.

**Yes:** Continue with the next step.
11. Replace the system backplane (Un-P1). Reinstall all of the parts you have removed or exchanged in this procedure.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The system is fixed. **This ends the procedure.**
12. Does the system contain only one power supply?

**Yes:** Continue with the next step.

**No:** Go to step 14 on page 156.
13. Replace the power supply.

Does a power reference code occur?

**Yes:** Contact your service support. **This ends the procedure.**

**No:** The system is fixed. **This ends the procedure.**

14. Power off the system. Remove one of the power supplies, then power on the system. See Powering on and powering off the system .  
Does a power reference code occur?  
**Yes:** Continue with the next step.  
**No:** The power supply you just removed is defective. Replace it. **This ends the procedure.**
15. Power off the system. Reinstall the power supply that was removed in step 14, and remove the other power supply. Power on the system. See Powering on and powering off the system .  
Does a power reference code occur?  
**Yes:** Continue with the next step.  
**No:** The power supply you just removed is defective. Replace it. **This ends the procedure.**
16. Power off the system. Replace both power supplies. Power on the system.  
Does a power reference code occur?  
**Yes:** Contact your service support.**This ends the procedure.**  
**No:** The system is fixed. **This ends the procedure.**

## PWR1906

The server detected an error in the power system.

Please see “Power isolation procedures” on page 137 for important safety information before servicing the system.

### PWR1906 Instructions for 5094 and 5294 expansion units

1. Perform the following:
  - a. Power off the unit you are working on.
  - b. Disconnect all the I/O devices (tape, diskette, optical, and disk units) from the unit that you are working on by sliding them partially out of the unit. See the service guide for the unit you are servicing.
  - c. Remove and label all of the cards that are installed in the PCI adapter slots.
  - d. Power on the unit you are working on.
 Does a power reference code occur?  
**Yes:** Continue with the next step.  
**No:** Go to step 9 on page 157.
2. Perform the following:
  - a. Power off the unit you are working on.
  - b. Remove, in order, all power supplies except the first one (either P00 or P01 depending on the configuration).
  - c. Power on the unit you are working on.
 Does a power reference code occur?  
**Yes:** Continue with the next step.  
**No:** Go to step 4 on page 157.
3. Perform the following:
  - a. Power off the unit you are working on.
  - b. Remove the power supply that was left installed in step 2.
  - c. Reconnect the next power supply in order (P01 or P02).
  - d. Power on the unit you are working on.
 Does a power reference code occur?  
 • **Yes:** Go to step 5 on page 157.

- **No:** Exchange the power supply you removed in step 3b on page 156.  
**This ends the procedure.**
4. Perform the following:
    - a. Power off the unit you are working on.
    - b. Reconnect the next power supply in order.
    - c. Power on the unit you are working on.

Does a power reference code occur?

    - **No:** Repeat this step until all power supplies have been reconnected.  
**This ends the procedure.**
    - **Yes:** Exchange the power supply that you reconnected in this step.  
**This ends the procedure.**
  5. Perform the following:
    - a. Remove one of the fans from the unit you are working on that you did not previously remove during this procedure.
 

**Note:** Disregard a fan reference code if it occurs during this step.
    - b. Power on the unit you are working on.

Does a power reference code occur?

    - **Yes:** Continue with the next step.
    - **No:** The fan that you removed in this step is the failing item.  
**This ends the procedure.**
  6. Have you removed all of the fans, one at a time?
    - **Yes:** Install all of the fans and continue with the next step.
    - **No:** Perform the following:
      - a. Power off the unit you are working on.
      - b. Reinstall the fan that was removed in step 5 to its original location.
      - c. Repeat step 5.
  7. Perform the following:
    - a. Remove the power cable (that was not previously removed) from one of the lower DASD device boards (CB1 or CB2).
    - b. Power on the unit you are working on.

Does a power reference code occur?

    - **Yes:** Continue with the next step.
    - **No:** Replace the DASD device board that the power cable was removed from in this step.  
**This ends the procedure.**
  8. Is a second lower DASD backplane installed and its power cable connected?
    - **Yes:** Repeat step 7.
    - **No:** Replace the following one at a time:
      - a. DASD upper device board (DB3)
      - b. I/O enclosure backplane (CB1).**This ends the procedure.**
  9. Perform the following:
    - a. Power off the unit you are working on.
    - b. Reinstall all of the cards that you removed in step 1 on page 156.
    - c. Reconnect the ac power cable to the unit that you are working on.
    - d. Power on the unit you are working on.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 12.

10. Perform the following:

- a. Power off the unit you are working on.
- b. Disconnect one of the cards that you connected in step 9 on page 157.
- c. Power on the unit you are working on.

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** Exchange the last card that you disconnected in this step.

**This ends the procedure.**

11. Have you disconnected all the cards?

**Yes:** Continue with the next step.

**No:** Repeat step 10.

12. Perform the following:

- a. Power off the unit you are working on.
- b. Reconnect all of the I/O devices (tape, diskette, optical, or disk units) that you disconnected in step 1 on page 156.
- c. Power on the unit you are working on.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No: This ends the procedure.**

13. Perform the following:

- a. Power off the unit you are working on.
- b. If you have not already done so, disconnect all of the I/O devices (tape, diskette, optical, or disk units) that you reconnected in step 12.
- c. Reconnect one of the I/O devices (tape, diskette, optical, or disk units) that you just disconnected.
- d. Power on the unit you are working on.

Does a power reference code occur?

- **No:** Continue with the next step.
- **Yes:** Exchange the last I/O device that you reconnected in this step.

**This ends the procedure.**

14. Have you reconnected all the I/O devices?

**Yes: This ends the procedure.**

**No:** Repeat step 13 (you can skip part b).

## PWR1907

A unit was dropped from the SPCN configuration.

1. Is the reference code you are working with 1xxx 913B?

- **No:** Continue with the next step.
- **Yes:** A system power control network (SPCN) firmware update is needed, but not started due to the SPCN firmware update policy setting. A manual update needs to be started.

**Notes:**

- Do not perform maintenance on an expansion unit or modify the SPCN network while the SPCN firmware update is being performed.
  - Performing firmware updates or powering off the system will interrupt SPCN firmware updates and the firmware update will need to be started again after these actions.
- a. Access the Advanced System Management Interface (ASMI) and select **System Configuration** and then **Configure I/O Enclosures**.
  - b. Record the current SPCN firmware update policy setting so it can be restored later.
  - c. Change the SPCN firmware update policy setting to expanded and click **Save Policy Setting** to allow for SPCN firmware updates to be done over the RIO/HSL and serial SPCN interfaces.
  - d. Select **Start SPCN Firmware Update**. The SPCN firmware will now be downloaded to the expansion units that require an update.
  - e. Change the SPCN firmware update policy setting back to what it was originally set to in step 1b and click on **Save Policy Setting**.

**Note:** The SPCN firmware update can be stopped using the Stop SPCN Firmware Update button. However, to allow the expansion units to be updated to the latest SPCN firmware level, it is recommended that the firmware update be allowed to complete.

The progress of the SPCN firmware update can be monitored by clicking on **Configure I/O Enclosures** to update the screen. Do not use the browser **Back** or **Refresh** button to monitor the update progress. The Power Control Network Firmware Update Status column shows the percentage complete and In Progress is displayed while the download is progresses. Not Required is displayed when the download process completes.

**This ends the procedure.**

2. Is the reference code you are working with 1xxx 90F0?
  - **No:** Contact your next level of support.
  - **Yes:** A unit was dropped from the SPCN configuration.  
This can be caused by any of the following:
    - The rack or unit has lost all ac or dc power.
    - The SPCN function in the unit has an error.
    - The SPCN frame-to-frame cable cable has failed.
3. Using the HMC or ASMI, find the 1xxx 90F0 SRC in the error log (see Displaying error and event logs). Use the option **Show details** to display the location information for the failing unit.
4. After locating the failing unit, ensure that the SPCN cable is seated correctly. Reseat the SPCN cable, if necessary.  
Is the cable connected correctly?
  - **No:** Correctly reconnect the SPCN cable, or replace them if necessary. **This ends the procedure.**
  - **Yes:** Continue with the next step.
5. Are the ac line cords on the failing unit connected properly at both ends?
  - **No:** Reconnect the ac line cords, or replace them if necessary. **This ends the procedure.**
  - **Yes:** Continue with the next step.
6. Check the voltage at the customer's ac outlet. Is the voltage correct?
  - **No:** Inform the customer that the voltage at the ac power outlet is incorrect. **This ends the procedure.**
  - **Yes:** Continue with the next step.
7. Are the power supplies functional?
  - **No:** Perform the following:
    - a. Refer to System FRU locations to determine the location and part number for each power supply, and to find the appropriate procedure for exchanging the power supplies.

- b. Replace each power supply one at a time, until the problem has been resolved.
  - c. If the problem persists after replacing all of the power supplies, continue with the next step.
  - **Yes:** Continue with the next step.
8. Use the following table to determine the FRUs to replace. Refer to System FRU locations for instructions on replacing FRUs. **This ends the procedure.**

Table 44. Expansion enclosures FRUs

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

## PWR1908

A power supply fault or load fault has occurred in a 5088 or 0588 expansion unit.

For important safety information before servicing the system, see “Power isolation procedures” on page 137. For location information, see the service guide for the enclosure you are working on.

### PWR1908 instructions for 5088 or 0588 expansion units

Refer to System FRU locations for instructions for removing and replacing any FRUs called out by the following procedure.

1. Perform the following:
  - a. Power off the frame that you are working on by removing the ac jumper cable from the power supplies on the 5088 or 0588 expansion unit.
  - b. Remove and label all cards installed in the PCI backplane area.
  - c. Power on the frame by reconnecting the ac jumper cable to the unit.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 8 on page 162.

2. Is the reference code 1xxx 2603?
  - **No:** Continue with the next step.
  - **Yes:** Replace the PCI backplane.

**This ends the procedure.**

3. Perform the following:
  - a. Power off the frame you are working on by removing the ac jumper cable from the power supplies on the 5088 or 0588 expansion unit.
  - b. Remove power supply P01.
  - c. Remove fan assembly B01 from power supply P01 and install it on a new power supply P01.
  - d. Install the new power supply P01.
  - e. Power on the frame by reconnecting the ac jumper cable to the unit you are working on.

Does a power reference code occur?

• **Yes:** Continue with the next step.

• **No:** The power supply that you replaced in this step was the failing item.

**This ends the procedure.**

4. Perform the following:
  - a. Power off the frame you are working on by removing the ac jumper cable from the power supplies on the 5088 or 0588 expansion unit.
  - b. Remove the new power supply P01 and replace it with the original power supply P01.
  - c. Remove power supply P02.
  - d. Remove fan assembly B02 from power supply P02 and install it on a new power supply P02.
  - e. Install the new power supply P02.
  - f. Power on the frame by reconnecting the ac jumper cable to the unit you are working on.

Does a power reference code occur?

    - **Yes:** Continue with the next step.
    - **No:** The power supply that you replaced in this step was the failing item.

**This ends the procedure.**
5. Perform the following:
  - a. Power off the frame you are working on by removing the ac jumper cable from the power supplies on the 5088 or 0588 expansion unit.
  - b. Remove both the new power supply P02 and the fan assembly B02.
  - c. Reinstall the original power supply P02 and a new fan assembly B02.
  - d. Power on the frame by reconnecting the ac power cables to the unit you are working on.

Does a power reference code occur?

    - **Yes:** Continue with the next step.
    - **No:** The fan assembly B02 that you replaced in this step was the failing item.

**This ends the procedure.**
6. Perform the following:
  - a. Power off the frame you are working on by removing the ac jumper cable from the power supplies on the 5088 or 0588 expansion unit.
  - b. Remove power supply P02.
  - c. Replace the new fan assembly B02 with the original fan assembly B02.
  - d. Reinstall power supply P02.
  - e. Remove power supply P01.
  - f. Remove fan assembly B01 and replace it with a new fan assembly B01.
  - g. Reinstall power supply P01.
  - h. Power on the frame by reconnecting the ac jumper cable to the unit you are working on.

Does a power reference code occur?

    - **Yes:** Continue with the next step.
    - **No:** The fan assembly B01 that you removed in this step is the failing item.

**This ends the procedure.**
7. Perform the following:
  - a. Power off the frame you are working on by removing the ac jumper cable from the power supplies on the 5088 or 0588 expansion unit.
  - b. Remove power supply P01.
  - c. Replace fan assembly B01 with the original fan assembly B01.
  - d. Reinstall power supply P01.
  - e. Replace the following FRUs one at a time:
    - Display panel.
    - PCI backplane assembly CB1.

**This ends the procedure.**

8. Perform the following:
  - a. Power off the frame you are working on by removing the ac jumper cable from the power supplies on the 5088 or 0588 expansion unit.
  - b. Reinstall one of the cards that you removed in step 1 on page 160.
  - c. Power on the frame by reconnecting the ac power cables to the unit you are working on.

Does a power reference code occur?

- **No:** Continue with the next step.
- **Yes:** Exchange the last card that you reinstalled in this step.

**This ends the procedure.**

9. Have you reinstalled all of the cards?
  - **Yes:** Replace the PCI backplane assembly CB1.

**This ends the procedure.**

  - **No:** Repeat step 8, reinstalling the next card.

## PWR1909

A power supply load fault is occurring in a system expansion unit or I/O tower.

For important safety information before servicing the system, refer to “Power isolation procedures” on page 137.

### Instructions for 5095, 0595, 5790, 5796, 5802 and 5877, 7311-D11, 7311-D20 and 7314-G30

Refer to System FRU locations for information on FRU location called out by this procedure.

1. Perform the following:
  - a. Power off the system.
  - b. Disconnect all the I/O devices (tape, diskette, optical, and disk units) from the expansion unit or I/O tower you are working on by sliding them partially out of the unit. See System FRU locations for information on FRU location and removal.
  - c. Remove and label all cards installed in the PCI adapters area.
  - d. Power on the system. See Powering on and powering off the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 8 on page 163.

2. Perform the following:
  - a. Power off the system. See Powering on and powering off the system .
  - b. Remove one of the fans from the expansion unit or I/O tower that you have not previously removed during this procedure.

**Note:** If a fan reference code occurs during this step, ignore it.

- c. Power on the system. See Powering on and powering off the system .

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** The fan you removed in this step is the failing item.

**This ends the procedure.**

3. Have you removed all of the fans one at a time?
  - **No:** Perform the following:
    - a. Power off the system. See Powering on and powering off the system .

- b. Reinstall the fan that you removed in step 2 on page 162 into its original location.
  - c. Repeat step 2 on page 162.
  - **Yes:** Reinstall all of the fans and continue with the next step.
4. Perform the following:
- Note:** If there are no DASD installed in this enclosure, go to step 6.
- a. Power off the system. See Powering on and powering off the system .
  - b. Remove the I/O tower power supply cable, at the DASD backplane, that you have not previously removed.
  - c. Power on the system. See Powering on and powering off the system .
- Does a power reference code occur?
- **No:** The DASD backplane that was disconnected in this step is the failing item.  
**This ends the procedure.**
  - **Yes:** Continue with the next step.
5. Have you disconnected the power cables from each of the DASD backplanes one at a time?
- Yes:** Continue with the next step.  
**No:** Repeat step 4.
6. Perform the following:
- a. Power off the system. See Powering on and powering off the system .
  - b. Remove a power supply that you have not previously removed, and replace it with a new one.
  - c. Power on the system. See Powering on and powering off the system .
- Does a power reference code occur?
- **Yes:** Continue with the next step.
  - **No:** The power supply that was removed in this step is the failing item.  
**This ends the procedure.**
7. Have you removed all of the power supplies one at a time?
- **Yes:** Perform the following:
    - a. Remove the new power supply that you installed in step 6 and reinstall the original power supply.
    - b. Replace the I/O backplane if you are working on a 7311-D11, 7314-G30, 5790, 5796, or 5802 and 5877. Replace the tower backplane if you are working on a 5095 or 0595.  
**This ends the procedure.**
  - **No:** Remove the new power supply that you installed in step 6 and reinstall the original power supply. Then, repeat step 6.
8. Perform the following:
- a. Power off the system. See Powering on and powering off the system .
  - b. Reinstall all of the cards you removed in step 1 on page 162.
  - c. Power on the system. See Powering on and powering off the system .
- Does a power reference code occur?
- Yes:** Continue with the next step.  
**No:** Go to step 11 on page 164.
9. Perform the following:
- a. Power off the system. See Powering on and powering off the system .
  - b. Disconnect one of the cards you reconnected in step 8.
  - c. Power on the system. See Powering on and powering off the system .
- Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** Exchange the last card you disconnected in this step. See System FRU locations for information on the FRU location for the system that you are servicing. Reinstall all the parts.

**This ends the procedure.**

10. Have you disconnected all the cards?

- **No:** Repeat step 9 on page 163.
- **Yes:** Reinstall all the parts and return to Start of Call.

**This ends the procedure.**

11. Perform the following:

- Power off the system.
- Reconnect all of the I/O devices (tape, diskette, optical, or disk units) that you disconnected in step 1 on page 162.
- Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** **This ends the procedure.**

12. Perform the following:

- Power off the system.
- Disconnect one of the I/O devices you reconnected in step 11.
- Power on the system.

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** Exchange the last I/O device you disconnected in this step.

**This ends the procedure.**

13. Have you disconnected all of the I/O devices?

- **No:** Repeat step 12.
- **Yes:** Reinstall all the parts and return to Start of Call.

**This ends the procedure.**

## PWR1911

You are here because of a power problem on a dual line cord system. If the failing unit does not have a dual line cord, return to the procedure that sent you here or go to the next item in the FRU list.

The following steps are for the system unit, unless other instructions are given. For important safety information before servicing the system, refer to "Power isolation procedures" on page 137.

- If an uninterruptible power supply is installed, verify that it is powered on before proceeding.
- Are all the units powered on?
  - **Yes:** Go to step 7 on page 166.
  - **No:** On the unit that does not power on, perform the following:
    - Disconnect the ac line cords from the unit that does not power on.
    - Use a multimeter to measure the ac voltage at the system end of both ac line cords.

Table 45. Correct ac voltage

Model or expansion unit	Correct ac voltage
Models 8203-E4A, 5095, 0595, and 7311-D20 expansion units	100 V to 127 V or 200 V to 240 V

Table 45. Correct ac voltage (continued)

Model or expansion unit	Correct ac voltage
Models 8234-EMA, 9117-MMA, 9406-MMA, 5796 and 7314-G30 expansion units	200 V to 240 V
5088, 0588, 5094, 5294, 5790, and 7311-D11 expansion units	200 V to 240 V ac or dc
5095, 0595, and 7311-D20 expansion units	100 V to 127 V or 200 V to 240 V

c. Is the voltage correct (refer to Table 45 on page 164)?

**Yes:** Continue with the next step.

**No:** Go to step 6 on page 166.

3. Are you working on a system 8203-E4A, 8204-E8A, 8234-EMA, 9117-MMA, and 9406-MMA, 9407-M15, 9408-M25, 9409-M50, or a 5095, 0595, 5790, 5796, 7314-G30, 7311-D11, 7311-D20 expansion unit?

- **No:** Continue with the next step.
- **Yes:** Perform the following:
  - a. Reconnect the ac line cords.
  - b. Verify that the failing unit fails to power on.
  - c. Replace the failing power supply. Use the table below to determine which power supply needs replacing, and then see System FRU locations for its location, part number, and exchange procedure.

Table 46. Failing power supply for models 8203-E4A, 8204-E8A, 8234-EMA, 9117-MMA, and 9406-MMA, 9407-M15, 9408-M25, and 9409-M50, or a 5095, 0595, 5790, 5796, 7314-G30, 7311-D11, 7311-D20 expansion units

Reference code	Models or expansion units	Failing item name
1510	8203-E4A, 8204-E8A, 8234-EMA, 9117-MMA, and 9406-MMA, 9407-M15, 9408-M25, 9409-M50	Power supply 1
	5095, 0595, 5790, 5796, 7314-G30, 7311-D11, 7311-D20	Power supply 1
1520	8203-E4A, 8204-E8A, 8234-EMA, 9117-MMA, and 9406-MMA, 9407-M15, 9408-M25, 9409-M50	Power supply 2
	5095, 0595, 5790, 5796, 7314-G30, 7311-D11, 7311-D20	Power supply 2

**This ends the procedure.**

4. Perform the following:
- a. Reconnect the ac line cord to the ac modules.
  - b. Remove the ac jumper cables at the power supplies.
  - c. Use a multimeter to measure the ac voltage at the power-supply end of the jumper cable.

Is the ac voltage from 200 V to 240 V?

- **No:** Continue with the next step.
- **Yes:** Replace the failing power supply. Use the following table to determine which power supply must be replaced, and then see System FRU locations for its location, part number, and exchange procedure.

**Attention:** Do not install power supplies P00 and P01 ac jumper cables on the same ac module.

Table 47. Failing power supply for 5094, 5294, 5088 or 0588 expansion units

Reference code	Failing item name
1500	Power supply 0
1510	Power supply 1 for 5094 or 5294
	Power supply 2 for 5088 or 0588
1520	Power supply 2 for 5094 or 5294
	Power supply 1 for 5088 or 0588
1530	Power supply 3

**This ends the procedure.**

5. Perform the following:

- a. Disconnect the ac jumper cable at the ac module output.
- b. Use a multimeter to measure the ac voltage at the ac module output.

Is the ac voltage from 200 V to 240 V?

- **Yes:** Exchange the ac jumper cable.

**This ends the procedure.**

- **No:** Exchange the ac module. See System FRU locations for FRU location information for the system that you are servicing.

**This ends the procedure.**

6. Perform the following:

- a. Disconnect the ac line cords from the customer's ac power outlet.
- b. Use a multimeter to measure the ac voltage at the customer's ac power outlet.

Is the ac voltage correct (refer to Table 45 on page 164)?

- **Yes:** Exchange the failing ac line cord.

**This ends the procedure.**

- **No:** Perform the following:

- a. Inform the customer that the ac voltage at the power outlet is not correct.
- b. Reconnect the ac line cords to the power outlet after the ac voltage at the power outlet is correct.

**This ends the procedure.**

7. Is the reference code 1xxx00AC?

- **No:** Continue with the next step.
- **Yes:** This reference code may have been caused by an ac outage. If the system will power on without an error, no parts need to be replaced.

**This ends the procedure.**

8. Is the reference code 1xxx1510 or 1520?

- **No:** Continue with the next step.
- **Yes:** Perform the following:
  - a. Use the following table, figures and location codes to locate the failing parts. See System FRU locations for information on FRU location for the system that you are servicing..

Table 48. Power Reference Code Table

Model or expansion unit	Reference code	Locate these parts
8203-E4A, 8204-E8A, 8234-EMA, 9117-MMA, and 9406-MMA, 9407-M15, 9408-M25, 9409-M50	1xxx 1510	Power supply E1 and ac line cord 1
	1xxx 1520	Power supply E2 and ac line cord 2

Table 48. Power Reference Code Table (continued)

Model or expansion unit	Reference code	Locate these parts
5088 and 0588 (see Figure 2 on page 168)	1xxx 1510	ac jumper cable connected to power supply 2 and the ac module
	1xxx 1520	ac jumper cable connected to power supply 1 and the ac module
5294 and 5094 (see Figure 1)	1xxx 1500	ac jumper cable connected to power supply 0 and the ac module
	1xxx 1510	ac jumper cable connected to power supply 1 and the ac module
	1xxx 1520	ac jumper cable connected to power supply 2 and the ac module
	1xxx 1530	ac jumper cable connected to power supply 3 and the ac module
5095 and 0595	1xxx 1510	Power supply 1 and ac line cord 1
	1xxx 1520	Power supply 2 and ac line cord 2
5790, 5796, 7314-G30, 7311-D11, 7311-D20	1xxx 1510	Power supply 1 and ac line cord 1
	1xxx 1520	Power supply 2 and ac line cord 2

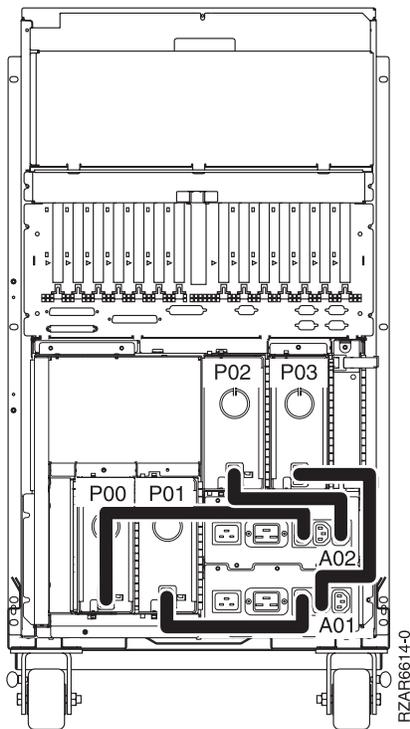


Figure 1. Dual line cord drawing for 5094

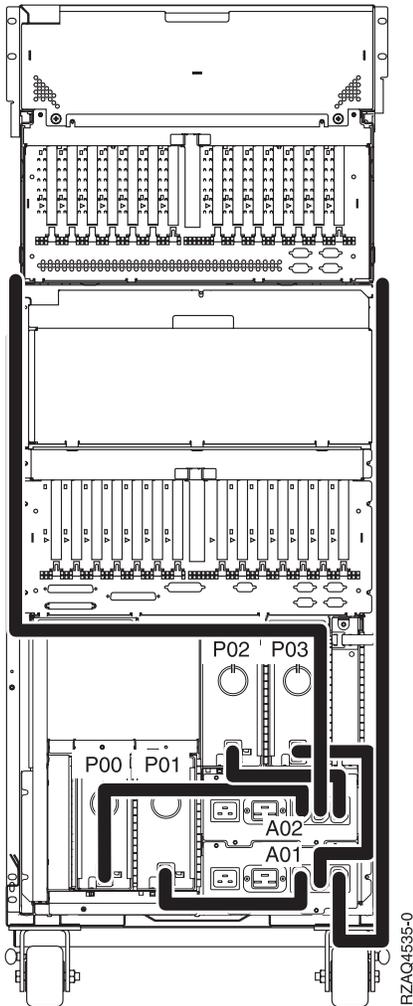


Figure 2. Dual line cord drawing for 5088, or 0588 installed on 5094

- b. Locate the ac line cord or the ac jumper cable for the reference code you are working on.
  - c. Go to step 10.
9. Is the reference code 1xxx 1500 or 1xxx 1530?
- **No:** Perform Problem Analysis using the reference code.  
**This ends the procedure.**
  - **Yes:** Locate the ac jumper cables for the reference code you are working on (see Table 48 on page 166), and then continue with the next step:
    - If the reference code is 1xxx 1500, determine the locations of ac jumper cables that connect to power supply P00 (see the preceding figures).
    - If the reference code is 1xxx 1530, determine the locations of ac jumper cables that connect to power supply P03 (see the preceding figures).
10. Perform the following:
- Attention:** Do not disconnect the other system line cord when powered on.
- Attention:** Do not disconnect the other ac jumper cable when powered on.
- a. For the reference code you are working on, disconnect either the ac jumper cable or the ac line cord from the power supply.
  - b. Use a multimeter to measure the ac voltage at the power supply end of the ac jumper cable or the ac line cord.

Is the ac voltage correct (see Table 45 on page 164)?

**No:** Continue with the next step.

**Yes:** Exchange the failing power supply. Refer to Table 46 on page 165 and Table 47 on page 166 for its position, and then see System FRU locations for part numbers and directions to the correct exchange procedures. **This ends the procedure.**

11. Perform the following:

- a. Disconnect the ac line cords from the power outlet.
- b. Use a multimeter to measure the ac voltage at the customer's ac power outlet.

Is the ac voltage correct (see Table 45 on page 164)?

• **Yes:** Exchange the following, one at a time:

- Failing ac line cord
- Failing ac jumper cable (if installed)
- Failing ac module (if installed) (see System FRU locations for part numbers and directions to the correct exchange procedures)

**This ends the procedure.**

• **No:** Perform the following:

- a. Inform the customer that the ac voltage at the power outlet is not correct.
- b. Reconnect the ac line cords to the power outlet after the ac voltage at the power outlet is correct.

**This ends the procedure.**

## PWR1912

The server detected an error in the power system.

### DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

1. Perform the following:
  - a. Ensure that both power line cords are properly connected.
  - b. Make sure that the unit EPO switch is in the *on* position.
  - c. Make sure that the unit EPO bypass switches on both bulk power controllers (BPCs) are in the *normal* position.
  - d. Ensure that the cable from unit EPO connector J00 to BPC-A connector J05 and the cable from unit EPO connector J01 to BPC-B connector J05 are secure and undamaged.
  - e. Ensure that the room temperature is not in excess of the maximum allowed (40° Celsius or 104° Fahrenheit).

**Note:** If the room temperature has exceeded the maximum allowed, the system may continually cycle on and off.

Were any problems discovered while performing the above checks?

**No:** Continue with the next step.

**Yes:** Correct any problems you found. **This ends the procedure.**

2. Make sure that the on/off switches on all the bulk power regulators (BPRs) are in the *on* (left) position.

**Note:** A switch set to the *off* position is not the cause of your problem, but they all need to be on before proceeding.

3. Check the state of the LEDs on both sides of the bulk power assembly (BPA) and then choose from the following conditions:
  - If all of the LEDs on both sides of the BPA are in the *off* position, go to step 4.
  - If the unit EPO power LED is turned on, the BPC **GOOD** LED is turned on, and all other LEDs are in the *off* position, go to step 5.
  - If neither of the above two conditions is true, independent faults are indicated on both sides of the BPA. Each side must be isolated separately. Call your next level of support. **This ends the procedure.**
4. Prepare a voltage meter to measure up to 600 V ac. Using the labelled test points on the frame, measure the voltage between phase A and phase B. Is the voltage greater than 180 V ac?

**Yes:** Independent faults are indicated on both sides of the BPA. Each side must be isolated separately. Call your next level of support. **This ends the procedure.**

**No:** Inform the customer that power line voltage at the input to the BPR is missing or too low and needs to be corrected. **This ends the procedure.**
5. Is a cable connected to connector J02 on the unit EPO card?

**No:** Continue with the next step.

**Yes:** Go to step 7 to determine if the room EPO circuit is the problem.
6. Is the internal toggle switch on the unit EPO card set to the *RM EPO BYPASS* position?

**No:** Set the internal toggle switch on the unit EPO card to the *RM EPO BYPASS* position. **This ends the procedure.**

**Yes:** The unit EPO card is the failing item and needs to be replaced. **This ends the procedure.**
7. Unplug the cable from connector J02 on the EPO card and set the toggle switch to the *RM EPO BYPASS* position. Does the EPO **CMPLT** LED on at least one BPC become lit?

**Yes:** Inform the customer that the room EPO circuit is defective at this connection and requires service. **This ends the procedure.**

**No:** The unit EPO card is the failing item and needs to be replaced. **This ends the procedure.**

## PWR1917

This procedure is used to display or change the configuration ID.

1. Use either the Advanced System Management Interface (ASMI) or the control panel to display and change the configuration ID.
  - If you are using the ASMI, refer to the operations guide for your system and use the instructions for *Changing system configuration*. Use Table 49 on page 172 to find the correct configuration ID.
  - If you are using the control panel, continue with the next step.
2. Perform the following to display the configuration ID:

**Attention:** The system or unit that will display the ID must be powered off with ac power applied.

### Notes:

- If you have just restored power to the system, the service processor must return to standby before control panel functions will work correctly. Returning the service processor to standby takes a few minutes *after* the panel appears to be operational.
  - You must have the panel in manual mode to access function 7 options.
- a. Select function 07 on the system control panel. Press Enter (07\*\* will be displayed).

- b. Use the arrow keys to increment or decrement to subfunction A8. 07A8 will be displayed. Press Enter (07A8 00 will be displayed).
- c. Use the arrow keys to increment or decrement to the first byte of the unit address (usually 3C) for the box you want to check. 07nn will be displayed, where nn is the first byte of the unit address.
- d. Press Enter (073C 00, for example, will be displayed).
- e. Use the arrow keys to increment or decrement to the second byte of the unit address (usually 01, 02, etc for I/O expansion units) for the box you want to check. 07nn will be displayed, where nn is the second byte of the unit address (0701, for example, for a unit). Press Enter (0701 00, for example, will be displayed).

**Note:** The display on the addressed I/O expansion unit being addressed should be blinking on and off while displaying the configuration ID as the last two characters of the bottom line.

- f. Use the following table to check the unit configuration ID.

Table 49. Unit Configuration IDs

Model or expansion unit	Configuration ID
5088 and 0588	89
5094 and 5294	8A
5095 and 0595	8B
5802 and 5877	8E
7311-D11, 5790	88
7311-D20	8C
7314-G30, 5796	8D

- g. Is the correct configuration ID displayed for the tower selected?
    - **No:** Continue with the next step.
    - **Yes:** Go to step 6 on page 173.
3. You need to set the unit configuration ID. Are you starting this step from the function 01 view on the control panel?
- **No:** To ensure that the control panel operates properly, return to function 01. Do the following:
    - a. The operator panel should still show the incorrect configuration ID (for example, 07C0).
    - b. Press Enter. The control panel will now show 07xx 00 (for example, 07C0 00).
    - c. Use the arrow keys to display 07\*\*, then press Enter. The control panel will now show 07.
    - d. Use the arrow keys to get the display to function 01, then press Enter. You should now be at the regular function 01 control panel view.
    - e. Continue with the next step.
  - **Yes:** Continue with step 4.
4. Set the unit configuration ID. Do the following:
- a. Select function 07 on the system control panel. Press Enter (07\*\* will be displayed).
  - b. Use the arrow keys to increment/decrement to subfunction A9 (07A9 will be displayed). Press Enter (07A9 00 will be displayed).
  - c. Use the arrow keys to increment/decrement to the first byte of the unit address (usually 3C) for the box that you want to change. 07nn (073C, for example) will be displayed, where nn is the first byte of the unit address. Press Enter (073C 00, for example, will be displayed).
  - d. Use the arrow keys to increment/decrement to the second byte of the unit address (usually 01, 02, etc for I/O Expansion units) for the box you want to check. 07nn will be displayed, where nn is the second byte of the unit address (01, for example, for a unit). Press Enter (0701 00, for example, will be displayed).

**Note:** The display on the addressed I/O expansion unit will be blinking on and off.

- e. Use the arrow keys to increment/decrement to the correct configuration ID (refer to Table 49 on page 172). 07xx will be displayed where xx is the configuration ID.
- f. Press Enter (07xx 00 will be displayed). After 20 to 30 seconds, the display on the addressed I/O expansion unit will stop blinking and return to the normal display format.

**Note:** To return the panel to normal display, scroll to 07\*\* and press Enter.

- g. Continue with the next step.
- 5. Power on the system. Do you still get SRC 1xxxx84D0 or 1xxxx840E?
  - **No: This ends the procedure.**
  - **Yes:** Continue with the next step.
- 6. Perform the following:
  - a. Power off the system.
  - b. Exchange the SPCN card in the failing frame. **This ends the procedure.**

## PWR1918

A voltage regulator card might be failing.

For instructions for removing and replacing any FRUs called out by the following procedure. See System FRU locations for information about FRU locations for the system that you are servicing.

To perform the correct PWR1918 for the system that you are servicing, select your machine type and model (system) from among the following:

8203-E4A, 9407-M15, and 9408-M25  
 8204-E8A and 9409-M50  
 8234-EMA, 9117-MMA, 9406-MMA

This procedure is not applicable to the 9125-F2A or the 9119-FHA.

For 8203-E4A, 9407-M15, and 9408-M25) and 8204-E8A and 9409-M50, use the following table to determine the action to perform.

Reference Code:	Action when servicing a 8203-E4A, 9407-M15, and 9408-M25	Action when servicing a 8204-E8A and 9409-M50
1xxx 2622	N/A	Replace the following, if present, one at a time, and in the order listed: <ol style="list-style-type: none"> <li>1. Base RAID card (Un-P1-C11)</li> <li>2. Auxiliary RAID card (Un-P1-C10)</li> <li>3. System backplane (Un-P1)</li> </ol>
1xxx 2623	Replace the following, if present, one at a time, and in the order listed: <ol style="list-style-type: none"> <li>1. Base RAID card (Un-P1-C10)</li> <li>2. Auxiliary RAID card (Un-P1-C9)</li> </ol>	Replace the following, if present, one at a time, and in the order listed: <ol style="list-style-type: none"> <li>1. Base RAID card (Un-P1-C11)</li> <li>2. Auxiliary RAID card (Un-P1-C10)</li> </ol>
1xxx 2624	Replace the following, if present, one at a time, and in the order listed: <ol style="list-style-type: none"> <li>1. Ethernet card (Un-P1-C7)</li> <li>2. Base RAID card (Un-P1-C10)</li> <li>3. Auxiliary RAID card (Un-P1-C9)</li> <li>4. System backplane (Un-P1)</li> <li>5. DASD drives</li> <li>6. DASD and media backplane (Un-P2)</li> </ol>	Replace the following, if present, one at a time, and in the order listed: <ol style="list-style-type: none"> <li>1. Ethernet card (Un-P1-C6)</li> <li>2. Base RAID card (Un-P1-C11)</li> <li>3. Auxiliary RAID card (Un-P1-C10)</li> <li>4. System backplane (Un-P1)</li> <li>5. DASD drives</li> <li>6. DASD and media backplane (Un-P2)</li> </ol>

Reference Code:	Action when servicing a 8203-E4A, 9407-M15, and 9408-M25	Action when servicing a 8204-E8A and 9409-M50
1xxx 2625	Replace the following, if present, one at a time, and in the order listed: <ol style="list-style-type: none"> <li>1. Base RAID card (Un-P1-C10)</li> <li>2. Auxiliary RAID card (Un-P1-C9)</li> <li>3. DASD drives d. DASD and media backplane (Un-P2)</li> <li>4. Ethernet card (Un-P1-C7)</li> <li>5. System backplane (Un-P1).</li> </ol>	Replace the following, if present, one at a time, and in the order listed: <ol style="list-style-type: none"> <li>1. Ethernet card (Un-P1-C6)</li> <li>2. Base RAID card (Un-P1-C11)</li> <li>3. Auxiliary RAID card (Un-P1-C10)</li> <li>4. System backplane (Un-P1)</li> <li>5. TPMD card (Un-P1-C12)</li> </ol>
1xxx 2626	Replace the Ethernet card (Un-P1-C7 if present.	Replace the Ethernet card (Un-P1-C6), if present.
1xxx 2630	Replace VRM1A and VRM1B (which are one CRU/FRU) on processor 1 (Un-P1-C13). See System FRU locations for FRU location information for the system that you are servicing.	Replace VRM1A and VRM1B (which are one CRU/FRU) on processor card 1 (Un-P1-C13-C10). See System FRU locations for FRU location information for the system that you are servicing.
1xxx 2632	Replace the following, one at a time, and in the order listed: <ol style="list-style-type: none"> <li>1. VRM2 for processor 1 (Un-P1-C18)</li> <li>2. System backplane (Un-P1)</li> </ol>	Replace VRM2 on processor card 1 (Un-P1-C13-C5). See System FRU locations for FRU location information for the system that you are servicing.
1xxx 2633	N/A	Replace the following, one at a time, and in the order listed: <ol style="list-style-type: none"> <li>1. Processor card 1 (Un-P1-C13-C10)</li> <li>2. Ethernet card (Un-P1-C6)</li> </ol>
1xxx 2634	N/A	Replace processor card 1 (Un-P1-C13-C10).
1xxx 2640	Replace VRM1A and VRM1B (which are one CRU/FRU) on processor 2 (Un-P1-C14).	Replace VRM1A and VRM1B (which are one CRU/FRU) on processor card 2 (Un-P1-C14-C10).
1xxx 2642	Replace the following, one at a time, and in the order listed: <ol style="list-style-type: none"> <li>1. VRM2 for processor 2 (Un-P1-C20)</li> <li>2. System backplane (Un-P1)</li> </ol>	Replace VRM2 on processor card 2 (Un-P1-C14-C5).
1xxx 2643	N/A	Replace the following, one at a time, and in the order listed: <ol style="list-style-type: none"> <li>1. Processor card 2 (Un-P1-C14-C10)</li> <li>2. Ethernet card (Un-P1-C6)</li> </ol>
1xxx 2644	N/A	Replace processor card 2 (Un-P1-C14-C10).
1xxx 2650	N/A	Replace VRM1A and VRM1B (which are one CRU/FRU) on processor card 3 (Un-P1-C15-C10).
1xxx 2652	N/A	Replace VRM2 on processor card 3 (Un-P1-C15-C5).
1xxx 2653	N/A	Replace the following, one at a time, and in the order listed: <ol style="list-style-type: none"> <li>1. Processor card 3 (Un-P1-C15-C10)</li> <li>2. Ethernet card (Un-P1-C6)</li> </ol>
1xxx 2654	N/A	Replace processor card 3 (Un-P1-C15-C10).

Reference Code:	Action when servicing a 8203-E4A, 9407-M15, and 9408-M25	Action when servicing a 8204-E8A and 9409-M50
1xxx 2660	N/A	Replace VRM1A and VRM1B (which are one CRU/FRU) on processor card 4 (Un-P1-C16-C10).
1xxx 2662	N/A	Replace VRM2 on processor card 4 (Un-P1-C16-C5).
1xxx 2663	N/A	Replace the following, one at a time, and in the order listed: 1. Processor card 4 (Un-P1-C16-C10) 2. Ethernet card (Un-P1-C6)
1xxx 2664	N/A	Replace processor card 4 (Un-P1-C16-C10).
1xxx 3120	N/A	Replace the following, if present: 1. The VRM specified by the location code. 2. The processor card specified by the location code.
1xxx 8450	At least one processor VRM is missing. Inspect all of the processor cards and install the VRM that are missing. See System FRU locations for FRU location information for the system that you are servicing.	At least one processor VRM is missing. Inspect all of the processor cards and install the VRMs that are missing. See System FRU locations for FRU location information for the system that you are servicing.

For 8234-EMA, 9117-MMA, 9406-MMA, use the following table to determine the action to perform.

Reference Code:	Action when servicing a 8234-EMA, 9117-MMA, 9406-MMA:
1xxx 1611, 1612, or 1613	Voltage regulator 1 is the failing item and needs to be replaced.
1xxx 1621, 1622, or 1623	Voltage regulator 2 is the failing item and needs to be replaced.
1xxx 1631, 1632, or 1633	Voltage regulator 3 is the failing item and needs to be replaced.
1xxx 2602	Perform problem analysis using the reference code.
1xxx 8450	You have fewer voltage regulator cards than processor cards. Add another regulator card in the next empty position.
1xxx 8451	You have too few voltage regulator cards installed. Add another regulator card in the next empty position.
For all other reference codes	<ol style="list-style-type: none"> <li>1. Perform the following: <ol style="list-style-type: none"> <li>a. Remove one of the voltage regulator cards that you have not already removed in this procedure and replace it with a new one.</li> <li>b. Power on the system. See Powering on and powering off the system for information on starting and stopping your system.</li> <li>c. Does reference code 1xxx 2602 appear again? <ul style="list-style-type: none"> <li><b>No:</b> The voltage regulator card that you replaced was the failing item. <b>This ends the procedure.</b></li> <li><b>Yes:</b> Continue with the next step.</li> </ul> </li> </ol> </li> <li>2. Have you replaced all of the voltage regulator cards? <ul style="list-style-type: none"> <li><b>No:</b> Reinstall the original regulator card, and then repeat substep 1a of this table.</li> <li><b>Yes:</b> Replace the regulator distribution connection backplane (P2). <b>This ends the procedure.</b></li> </ul> </li> </ol>

## PWR1920

Use this procedure to verify that the lights on the server control panel and the display panel on all attached I/O expansion units are operating correctly.

For important safety information before continuing with this procedure, see “Power isolation procedures” on page 137.

Refer to System FRU locations for instructions for removing and replacing any FRUs called out by the following procedure.

1. Activate the lamp test by performing *one* of the following:
  - Select function 04 **lamp test** on the control panel and press Enter.
  - Sign on to ASMI and click **System Configuration -> Service Indicators -> Lamp Test**.
2. Look at the server control panel and the display panels on all attached I/O towers. The lamp test is active only for 25 seconds after you press Enter. Check the following lights on the server control panel and all I/O enclosures and towers:
  - Power-on light.
  - Attention light.
  - All dots for the 32 character display.

Are all the lights on the control panel and the I/O display panels on?

  - **No:** Go to step 4.
  - **Yes:** These control panel lights are working correctly. Continue with the next step.
3. Are any abnormal characters or character patterns (not reference codes or normal display mode) displayed?
  - **No:** The lights are operating correctly.  
**This ends the procedure.**
  - **Yes:** Continue with the next step.
4. Verify that all cables are seated correctly. If the problem persists, replace the control panel. If the problem still persists, use the following table to determine the possible causes for the lamp test failure:

Table 50. Failing unit

Failing unit	FRU
8203-E4A, 8204-E8A9407-M15, 9408-M25, or 9409-M50	System backplane
8234-EMA, 9117-MMA, or 9406-MMA	Replace the following one at a time: <ul style="list-style-type: none"><li>• Service Processor or SPCN card</li><li>• Control panel cable</li><li>• The I/O backplane on which you previously replaced the service processor.</li></ul>
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

## PWR2402

Use this procedure when the server detects an error in the power system.

For important safety information before continuing with this procedure, see “Power isolation procedures” on page 137.

Refer to System FRU locations for instructions for removing and replacing any FRUs called out by the following procedure.

1. Is the SRC 1xxx-8700 or 8701?

**No:** Return to the Start of call procedure. **This ends the procedure.**

**Yes:** Continue with the next step.

2. Measure voltages on the BPR(s). If the SRC is 1xxx8720, you should measure the voltage on BPR-A (front). If the SRC is 1xxx8721, you should measure the voltage on BPR-B (rear). The test points are on the left side of BPR-1 and BPR-2. Using the labeled test points on the face of the BPR, measure the voltages between the following:

- phase A and phase B
- phase B and phase C phase
- C and phase A

Are all of the meter readings greater than 180 V ac?

**No:** Inform the customer that power voltage at the input to the BPR is either missing or too low and needs to be corrected. **This ends the procedure.**

**Yes:** Go to step 4.

3. Does the check confirm that the customer’s voltage levels missing or too low?

**No:** Replace the power cord (see Cables for the proper part number). **This ends the procedure.**

**Yes:** The customer must correct the voltage levels. **This ends the procedure.**

4. Exchange the following FRUs, one at a time, until the problem is resolved.

**Note:** See System FRU locations for information on FRU locations for the system that you are servicing.

- Bulk power regulator (BPR) 1
- BPR 2
- BPR 3
- BPR 4
- Bulk power controller (BPC)
- Bulk power assembly (BPA)

**This ends the procedure.**

---

## Router isolation procedures

These procedures serve as a guide to the correct isolation procedures from the reference code tables.

### DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

Perform these procedures only when directed to do so from another procedure.

### RTRIP01

Gives a link to a topic that might assist you when exchanging the I/O processor (IOP) for the system or partition console of i5/OS™.

Perform "CONSL01" on page 31.

### RTRIP02

Gives a link to a topic that might assist you when diagnosing workstation IOP detected errors.

Perform "TWSIP01" on page 282.

## RTRIP03

Gives links to topics to assist you when diagnosing workstation IOP detected errors.

If you have a twinaxial terminal for the console, perform “TWSIP01” on page 282. Otherwise, perform “WSAIP01” on page 289.

## RTRIP04

Use the FRU list in the service action log if it is available. If it is not available, examine word 5 of the reference code.

Is word 5 of the reference code zero (0000 0000)?

**Yes:** Perform “SIIOADP” on page 180.

**No:** Perform “PIOCARD.”

**This ends the procedure.**

## PIOCARD

The hardware that controls PCI adapters and PCI card slots detected an error.

The failing component is the adapter in the location specified by the Direct Select Address (DSA) in the reference code. When possible, the diagnostic code will determine the FRU location for the serviceable event view.

1. Are you working from the serviceable event view and a card location is listed with this FRU?

- **Yes:** The error is located at the listed card location. Go to step 5 on page 180.
- **No:** Perform the following:
  - a. Record the DSA, which is word 7 of the reference code.
  - b. Locate the card specified in the DSA by going to “MABIP53” on page 48. Return here after locating the FRU and continue with the next step.

2. Did you identify a single FRU location by using “MABIP53” on page 48?

**Yes:** This is the location of the failing item. Go to step 5 on page 180.

**No:** Continue with the next step.

3. Perform the following, referring to the remove and replace procedures for each FRU location you determined (you can find links to the locations information, and from there to the remove and replace procedures, in the table at the end of this procedure):

- a. Remove all of the adapter and/or IOP cards in the locations that are identified in the given range of card slots. Do not remove any FRUs with embedded adapters, only FRUs in PCI card slots.
- b. Replace each card one at a time.

**Note:** For IBM i adapters controlled by IOPs, replace the IOP before any of the adapters. Power on the unit after you replace each card until either the problem reappears or you have replaced each card.

c. Did the problem reappear?

**Yes:** The last card that you replaced before the problem appeared again is the failing item. **This ends the procedure.**

**No:** Continue with the next step.

4. Did you identify a FRU with embedded adapters when performing “MABIP53” on page 48?

**Yes:** The problem is in the FRU with the embedded adapter. Continue with the next step and exchange that FRU. **This ends the procedure.**

**No:** The problem may be intermittent. Contact your next level of support. **This ends the procedure.**

5. Use the table below to locate and replace the failing item. **This ends the procedure.**

Table 51. Failing item for symbolic FRU PIOCARD

System model, expansion unit, or machine type	Name of FRU to exchange	FRU location
8234-EMA, 8234-EMA, 9117-MMA, and 9406-MMA	PCI adapter, if you have detected a failing PCI adapter in a PCI slot of a system unit drawer, replace the PCI adapter that is in the failing slot.	Un-P1-Cx
	I/O backplane, if you detected a failing I/O controller that is embedded on a system unit's I/O backplane, replace the I/O backplane.	Un-P1
7311-D11	PCI adapter, if you have detected a failing PCI adapter in a PCI slot of an I/O expansion drawer, replace the PCI adapter that is in the failing slot.	Un-P1-Cx
7311-D20	PCI adapter, if you have detected a failing PCI adapter in a PCI slot of an I/O expansion drawer, replace the PCI adapter that is in the failing slot.	Un-Px-Cy
7311-G30	PCI adapter, if you have detected a failing PCI adapter in a PCI slot of an I/O expansion drawer, replace the PCI adapter that is in the failing slot.	Un-Px-Cy

**This ends the procedure.**

## SIIOADP

SIIOADP: RIO adapter/HSL I/O bridge (in a system unit or I/O unit).

**Note:** In the following procedures, the term *RIO adapter* refers to either a RIO adapter or an HSL I/O bridge, depending on the system you are working on.

1. Is a location for this FRU given in the serviceable event view?

- **Yes:** Use that location and replace the failing part. Refer to System FRU locations. **This ends the procedure.**
- **No:** Continue with the next step.

**Note:** In most circumstances, the SRC logged by the system firmware calls out a FRU list. In very few circumstances (as in the following examples), the failure requires immediate system termination.

### Example: Symptoms

```

1 B7006981 RIO/HSL (bridge) bus adapter failure SRC
2 XXXXXX62 SRC Format 62
3 00010002 Component ID field must be an exact match
4 14993203 Code Model and PRC must be an exact match
5 FRUCALLO Decode this when the SRC is 6906 or 6907
6 FRUCALLO Decode this when the SRC is 6981
7 00000000

```

### Example: SRC 6981

1 B7006981  
 2 00000062  
 3 00010002  
 4 14993203  
 6 00044000  
 7 00000000

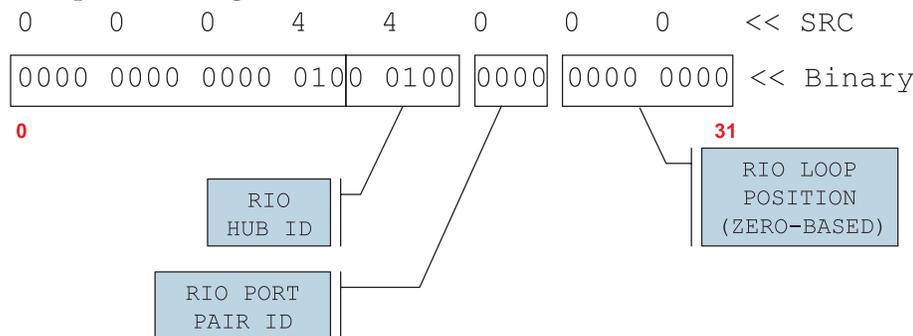
When immediate termination occurs, the SRC does not provide a FRU callout. The following steps describe how to determine the FRU callout.

2. Isolate the RIO adapter FRU indicated by the data in word 5 (when the SRC is 6906 or 6907) or word 6 (when the SRC is 6981) of the SRC by completing the following steps:

**Note:** Replace only the FRU with the RIO adapter FRU.

- a. Use the following example as a guide to locate and record the following binary values from word 5 or word 6 of the SRC:
  - RIO hub ID
  - RIO port pair ID
  - RIO loop position

**Example: Decoding FRU Callout 00044000**



IPHAU450-1

- b. Convert the binary values for the RIO hub ID, the RIO port pair ID, and the RIO loop position to decimal. Record these values for later use.
3. Each RIO hub controls two RIO loops, specified as the *first* and *second* loop. Use the following list to determine and record which of these two RIO loops is indicated in word 6 of the SRC:
  - When the binary value of the RIO port pair ID is 0000, the SRC indicates the **first** RIO loop
  - When the binary value of the RIO port pair ID is 0001, the SRC indicates the **second** RIO loop
4. To isolate the failing RIO adapter, you will walk the cabling for the specified RIO loop from the leading port to the trailing port. To determine the RIO loop number and RIO port location code for the leading port, do the following:
  - a. Make sure you have the following values at hand, then continue with the next step.
    - The decimal value for the RIO hub ID
    - The RIO loop indicated by the RIO port pair ID
  - b. Compare the values from the previous step to the location table (Table 52 on page 182) and graphic below. Record the values for the RIO loop number and the RIO port location code. Then continue with the next step.
    - System FRU locations.

Table 52. Model MMA SIIODP RIO loop location information

System Unit	Hub (decimal)	Hub loop	Loop number (hex / dec)	Location code for leading port of the loop
0	1	First	0686/1670	-P1-C8-T2
0	1	First	0781/1921	-P1-C8-T2
0	2	First	0688/1672	-P1-C9-T2
0	2	First	0782/1922	-P1-C9-T2
1	9	First	0696/1686	-P1-C8-T2
1	9	First	0789/1929	-P1-C8-T2
1	10	First	078A/1930	-P1-C9-T2
1	10	First	0698/1688	-P1-C9-T2
2	17	First	06A6/1702	-P1-C8-T2
2	17	First	0791/1937	-P1-C8-T2
2	18	First	06A8/1704	-P1-C9-T2
2	18	First	0792/1938	-P1-C9-T2
3	25	First	06B6/1718	-P1-C8-T2
3	25	First	0799/1945	-P1-C8-T2
3	26	First	06B8/1720	-P1-C9-T2
3	26	First	079A/1946	-P1-C9-T2

5. Isolate the failing RIO adapter by walking the cabling for the specified RIO loop from the leading port to the trailing port. Do the following:
  - a. Begin walking the cabling by starting at the RIO loop number and RIO port location code that you recorded in step 4b on page 181.
  - b. Starting with 0 (zero) for the first RIO adapter on the loop, follow the loop cabling and count each RIO adapter in the order it is cabled. For example, the first RIO adapter is 0, the next is 1, the next is 2, and so on.
  - c. Continue this process until you count up to the decimal value of the RIO loop position. The RIO adapter that corresponds to the value of the RIO loop position is the failing RIO adapter.

**Note: Concurrent maintenance** requires that you make a change to the previous procedure for counting the RIO adapters on the loop. If concurrent maintenance was performed to attach one or more additional RIO adapters to this loop and the server has not been IPL'ed after the adapters were added, then **exclude the added RIO adapters as you make the initial count**. If the RIO loop position exceeds the number of RIO adapters, continue by counting the added RIO adapters in the order they were added to the loop.

6. Exchange the failing RIO adapter. Refer to System FRU locations. **This ends the procedure.**

## RTRIP05

Use the attached procedure when this reference code occurs for a RIO/HSL/12X loop resource, when an I/O expansion unit on the loop is powered off for a concurrent maintenance action.

**Note:** This reference code can occur for the RIO/HSL/12X loop resource when an I/O expansion unit on the loop is powered off for a concurrent maintenance action.

**Note:** A fiber-optic cleaning kit may be required for optical RIO/HSL/12X connections.

1. Multiple B600 6982 errors may occur due to efforts to retry and recover. If the recovery efforts were successful, there will be a B600 6985 reference code with xxxx 3206 in word 4 logged after all B600 6982 reference codes in the product activity log (PAL). If this is the case, close out all the B600 6982 entries. Then continue with the next step.
2. Is there a B600 6987 reference code in the service action log (SAL) logged at about the same time?
  - Yes:** Close this problem and work the B600 6987.
  - This ends the procedure.**
  - No:** Continue with the next step.
3. Is there a B600 6981 reference code in the SAL logged at approximately the same time?
  - Yes:** Go to step 8.
  - No:** Continue with the next step.
4. Perform "RIOIP06" on page 37 to determine if any other systems are connected to this loop and then return here.

**Note:** The loop number can be found in the SAL in the description for the HSL\_LNK FRU.  
Are there other systems connect to this loop?

- Yes:** Continue with the next step.
  - No:** Go to step 8.
5. Check for HSL failures in the SALs on the other systems before replacing parts. HSL failures are indicated by SAL entries with HSL I/O bridge and Network Interface Controller (NIC) resources. Ignore B600 6982 and B600 6984 entries.  
Are there HSL failures on other systems?
    - Yes:** Continue with the next step.
    - No:** Go to step 8.
  6. Repair the problems on the other systems and return to this step. After making repairs on the other systems check the PAL of this system. Is there a B600 6985, along with this loop's resource name, that was logged after the repairs you made on the other systems?
    - Yes:** Continue with the next step.
    - No:** Go to step 8.
  7. For the B600 6985 reference code you found, use "Status indications for RIO/HSL" on page 20 to determine if the loop is now complete.  
Is the loop complete?
    - Yes:** The problem has been resolved.
    - This ends the procedure.**
    - No:** Go to step 8.
  8. The FRU list displayed in the SAL may be different from the failing item list given here. Use the SAL's FRU list when it is available.  
Does this reference code appear in the SAL with the symbolic FRU HSL\_LNK listed as a FRU?
    - Yes:** Perform "RIOIP01" on page 32.
    - This ends the procedure.**
    - No:** Exchange the FRUs listed in the SAL according to their part action codes.
    - This ends the procedure.**

## RTRIP06

Use the attached procedure when this reference code occurs in a service action code (SAL).

**Note:** A fiber-optic cleaning kit may be required for optical HSL connections.

1. Is the reference code in the service action log (SAL)?

- **Yes:** Continue with the next step.
- **No:** The reference code is informational. Use “Status indications for RIO/HSL” on page 20 to determine what the reference code means.

**This ends the procedure.**

2. This error can appear in the SAL if a tower or another system in the loop did not complete powering on before Licensed Internal Code (LIC) checked this loop for errors. Search the product activity log (PAL) for all B600 6985 reference codes logged for this loop and use “Status indications for RIO/HSL” on page 20 to determine if this error requires service.

Is further service required?

**Yes:** Continue with the next step.

**No: This ends the procedure.**

3. There may be multiple B600 6985 reference codes, with xxxx 3205 in word 4, for the same loop resource in the SAL. This is caused by attempts to retry and recover. If there is a B600 6985 reference code with xxxx 3206 or xxxx 3208 in word 4 after the above B600 6985 entries in the PAL, then the recovery efforts were successful. If this is the case, close all the B600 6985 entries for that loop resource in the SAL. Then continue with the next step.

4. Is there a B600 6981 reference code in the SAL?

**Yes:** Close that problem and go to step 9.

**No:** Continue with the next step.

5. Perform “RIOIP06” on page 37 to determine if any other systems are connected to this loop and then return here.

**Note:** The loop number can be found in the SAL in the description for the HSL\_LNK FRU.

Are there other systems connected to this loop?

**Yes:** Continue with the next step.

**No:** Go to step 9.

6. Check for HSL failures in the SALs on the other systems before replacing parts. HSL failures are indicated by SAL entries with HSL I/O bridge and Network Interface Controller (NIC) resources. Ignore B600 6982 and B600 6984 entries.

Are there HSL failures on other systems?

**Yes:** Continue with the next step.

**No:** Go to step 9.

7. Repair the problems on the other systems and return to this step. After making repairs on the other systems check the PAL of this system. Is there a B600 6985 reference code that was logged after the repairs you made on the other systems?

**Yes:** Continue with the next step.

**No:** Go to step 9.

8. For the B600 6985 log you found, use “Status indications for RIO/HSL” on page 20 to determine if the loop is now complete.

Is the loop complete?

- **Yes:** The problem has been resolved.

**This ends the procedure.**

- **No:** Go to step 9.

9. The FRU list displayed in the SAL may be different from the failing item list given here. Use the SAL’s FRU list when it is available.

Does this reference code appear in the SAL with the symbolic FRU HSL\_LNK listed as a FRU?

- **Yes:** Perform “RIOIP01” on page 32.

**This ends the procedure.**

- **No:** Exchange the FRUs listed in the SAL according to their part action codes.  
**This ends the procedure.**

## **RTRIP07**

Gives a link to assist you when diagnosing a keyboard error.

Perform “WSAIP01” on page 289.

## **RTRIP08**

Gives a link to assist when the Licensed Internal Code detected an IOP programming problem.

Perform a system IPL. Is the IPL successful?

**Yes:** Perform “LICIP01” on page 100 to determine the cause of the problem.**This ends the procedure.**

**No:** Perform the action described in the new reference code. **This ends the procedure.**

---

## Serial-attached SCSI isolation procedures

Use serial-attached SCSI (SAS) isolation procedures when an HMC is not attached to the server. If the server is connected to an HMC, use the procedures that are available on the HMC to continue FRU isolation.

### DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

## SIP3110

This procedure resolves problems when disk units are incompatible or a disk unit is missing or failed.

The following SRCs are possible:

- SRC xxxx9025. Indicates that an incompatible disk unit is installed at the disk unit location that caused the array to be exposed.
- SRC xxxx9030. Indicates that a disk array is exposed due to a missing or failed disk unit.
- SRC xxxx9032. Indicates that a disk unit in a disk array is missing or failed, but the array is still protected.

If you received SRC xxxx9030 or xxxx9032, one of the following occurred:

- A disk unit has failed and the RAID array protection is exposed or will become exposed if another disk unit fails because no hot spare disk unit was available to replace it. If the array is exposed, then the array will continue to be exposed until the disk unit has been replaced and a manual rebuilding of the array has been started.
- A disk unit has failed in a RAID array, but a hot spare was used to automatically start rebuilding the array. Replace, format, and configure the failed disk unit as a hot spare.

**Note:** If the previous hot spare disk unit was a larger capacity than the failed disk unit, ensure that the customer understands that the replacement disk unit might not provide adequate hot spare coverage for all of the arrays under this adapter.

1. Is the device location information for this SRC available in the service action log (see Searching the service action log for details)?

**No:** Continue with the next step.

**Yes:** Exchange the disk unit. See Disk drive. **This ends the procedure.**

2. Identify the affected adapter and disk units by examining the product activity log. Perform one of the following to access system service tools (SST) or dedicated service tools (DST):

- If you can enter a command at the console, access system service tools (SST). See System service tools.
- If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.

3. Perform the following steps:

- a. Access the product activity log and display the SRC that sent you here.
- b. Press the F9 key for address information. This is the adapter address.
- c. Continue with the next step.

4. Perform the following steps:

- a. Return to the SST or DST main menu.
- b. Select **Work with disk units** → **Display disk configuration** → **Display disk configuration status**.
- c. On the Display disk configuration status display, look for the devices attached to the adapter that is identified in step 3.

Is there a device that has a status of RAID 5/Unknown, RAID 6/Unknown, RAID 5/Failed, or RAID 6/Failed?

**No:** Continue with step 7.

**Yes:** Continue with the next step.

5. Find the device that has a status of RAID 5/Unknown, RAID 6/Unknown, RAID 5/Failed, or RAID 6/Failed. This is the device that is causing the problem. Show the device address by selecting **Display Disk Unit Details** → **Display Detailed Address**. Record the device address. See System FRU locations and find the diagram of the system unit or of the expansion unit and find the following items:

- The slot that is identified by the direct select address of the adapter
- The disk unit location that is identified by the device address

6. Have you determined the location of the adapter and disk unit that is causing the problem?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** Exchange the disk unit that is causing the problem. See Disk drive. **This ends the procedure.**

7. Press the function key to cancel and to return to the Display Disk Configuration menu, then do the following:

- a. Select **Display disk hardware status**.
- b. Find a device that is either **Not operational** or **Read/write protected**.
- c. Display details for the device and get the location of the failed disk unit.

- d. Exchange the disk unit and configure it as a hot spare. Go to Disk drive. **This ends the procedure.**

## SIP3111

This procedure resolves the problem when two or more disk units are missing from a RAID 5 or RAID 6 disk array.

The following SRCs are possible:

- xxxx9020
- xxxx9021
- xxxx9022

1. Identify the affected adapter and disk units by examining the Product Activity Log. Perform the following:

- a. Access SST or DST.

- If you can enter a command at the console, access system service tools (SST). See System service tools.
- If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

- b. Access the Product Activity Log and record address information.

### If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the "Additional Information" to record the formatted log information. Record all devices that are missing from the disk array. These are the array members that have both a current address of 0 and an expected address that is not 0.

### If a type D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

**BBBB** Hexadecimal offsets 4C and 4D

**Cc** Hexadecimal offset 51

**bb** Hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see More information from hexadecimal reports. Record all devices that are missing from the disk array. These are the array members that have both a current address of 0 and an expected address that is not 0.

- c. Determine the location of the adapter and the devices that are causing the problem. See System FRU locations and find the diagram of the system unit, or the expansion unit. Then find the following items:
  - The card slot that is identified by the direct select address (DSA)
  - The disk unit locations that are identified by the unit addresses
2. Perform one of the following options (listed in order of preference ):

#### Option 1

Power off the system or partition and install the identified disk units in the correct physical locations (that is the expected addresses) in the system. **This ends the procedure.**

#### Option 2

Stop the disk array that contains the missing devices.

**Attention:** Customer data might be lost.

Perform the following:

- a. If you are not already using dedicated service tools, perform an IPL to DST. See Performing an IPL to dedicated service tools. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Select **Work with disk units**. Did you get to DST with a type D IPL?
  - No:** Select **Work with disk configuration** → **Work with device parity protection**. Then, continue with substep 2c.
  - Yes:** Continue with substep 2c.
- c. Select **Stop device parity protection**.
- d. Follow the online instructions to stop device parity protection.
- e. Perform an IPL from disk.

Does the IPL complete successfully?

**No:** Go to Start of Call. **This ends the procedure.**

**Yes:** **This ends the procedure.**

### Option 3

If the data on the disk units is not needed, initialize and format the remaining members of the disk array by performing the following steps:

**Attention:** Data on the disk unit will be lost.

If a type D IPL was not performed to get to SST or DST:

- a. Access SST or DST.
- b. Select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a type D IPL was performed to get to DST:

- a. Access DST.
- b. Select **Work with disk units**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

## SIP3112

This procedure resolves the problem when one or more disk array members are not at the required physical locations.

The possible SRC is SRC xxxx9023.

1. Identify the affected adapter and disk units that are not at their required locations by examining the Product Activity Log. Perform the following steps:
  - a. Access SST or DST.
    - If you can enter a command at the console, access system service tools (SST). See System service tools.

- If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
  - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Access the product activity log and record address information.

**If a type D IPL was not performed to get to SST or DST:**

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. Record all devices that are not at their required locations. These are the array members that have a current address and an expected address that do not match. A current address of 0 is acceptable, and no action is needed to correct it for a known failed drive in the array.

**If a type D IPL was performed to get to DST:**

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

**BBBB** Hexadecimal offsets 4C and 4D

**Cc** Hexadecimal offset 51

**bb** Hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see More information from hexadecimal reports. Record all devices that are not at their required locations. These are the array members that have a current address and an expected address that do not match. A current address of 0 is acceptable, and no action is needed to correct it for a known failed drive in the array.

- c. Determine the location of the adapter and the devices that are causing the problem. See System FRU locations and find the diagram of the system unit or the expansion unit. Then find the following items:
- The card slot that is identified by the direct select address (DSA)
  - The disk unit locations that are identified by the unit addresses
2. Perform only one of the following options (listed in order of preference):

**Option 1**

Power off the system or partition and install the identified disk units in the correct physical locations (that is the expected addresses) in the system. **This ends the procedure.**

**Option 2**

Stop the disk array that contains the missing devices.

**Attention:** Customer data might be lost.

Perform the following:

- a. If you are not already using dedicated service tools, perform an IPL to DST. See Performing an IPL to dedicated service tools. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Select **Work with disk units**. Did you get to DST with a type D IPL?

**No:** Select **Work with disk configuration** → **Work with device parity protection**. Then, continue with substep 2c.

**Yes:** Continue with the next substep 2c.

- c. Select **Stop device parity protection**.
- d. Follow the online instructions to stop device parity protection.
- e. Perform an IPL from disk.

Does the IPL complete successfully?

**No:** Go to Start of Call. **This ends the procedure.**

**Yes:** **This ends the procedure.**

### Option 3

If the data on the disk units is not needed, initialize and format the remaining members of the disk array by performing the following steps:

**Attention:** Data on the disk unit will be lost.

If a type D IPL was not performed to get to SST or DST:

- a. Access SST or DST.
- b. Select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a type D IPL was performed to get to DST:

- a. Access DST.
- b. Select **Work with disk units**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

## SIP3113

This procedure resolves problems when a disk array is or would become exposed and parity data is out of synchronization.

The possible SRC is *xxxx9027*.

1. Identify the affected adapter and disk units by examining the Product Activity Log. Perform the following steps:
  - a. Access SST or DST.
    - If you can enter a command at the console, access system service tools (SST). See System service tools.
    - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
    - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
  - b. Access the Product Activity Log and record address information.

### If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. Record all devices that are missing from the disk array. These are the array members that have both a current address of 0 and an expected address that is not 0.

### If a type D IPL was performed to get to DST:

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

**BBBB** Hexadecimal offsets 4C and 4D

**Cc** Hexadecimal offset 51

**bb** Hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see More information from hexadecimal reports. Record all devices that are missing from the disk array. These are the array members that have both a current address of 0 and an expected address that is not 0.

- c. Determine the location of the adapter and the devices that are causing the problem. See System FRU locations and find the diagram of the system unit or the expansion unit. Then find the following:
  - The card slot that is identified by the direct select address (DSA)
  - The disk unit locations that are identified by the unit addresses
2. Have the adapter or disk units been physically moved recently?  
**No:** Contact your hardware service provider. **This ends the procedure.**  
**Yes:** Continue with the next step.
3. Perform one of the following two options (listed in order of preference):

**Option 1**

Power off the system or partition and restore the I/O adapter and disk units back to their original configuration. **This ends the procedure.**

**Option 2**

Stop the disk array that contains the missing devices.

**Attention:** Customer data might be lost.

Perform the following:

- a. If you are not already using dedicated service tools, perform an IPL to DST. See Performing an IPL to dedicated service tools. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

- b. Select **Work with disk units**. Did you get to DST with a type D IPL?

**No:** Select **Work with disk configuration** → **Work with device parity protection**. Then, continue with substep 3c.

**Yes:** Continue with substep 3c.

- c. Select **Stop device parity protection**.
- d. Follow the online instructions to stop device parity protection.
- e. Perform an IPL from disk.

Does the IPL complete successfully?

**No:** Go to Start of Call. **This ends the procedure.**

**Yes:** **This ends the procedure.**

**Option 3**

If the data on the disk units is not needed, initialize and format the disk units by performing the following steps:

**Attention:** Data on the disk unit will be lost.

If a type D IPL was not performed to get to SST or DST:

- a. Access SST or DST.
- b. Select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures**.

- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a type D IPL was performed to get to DST:

- a. Access DST.
- b. Select **Work with disk units**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

## SIP3120

This procedure resolves the problem when Cache data associated with attached disk units cannot be found.

The possible SRC is *xxxx9010*

1. Has the server been powered off for several days?

**No** Go to step 2.

**Yes** Go to step 5.

2. Using the appropriate service procedures, remove the adapter. Install the new replacement storage adapter with the following parts installed on it:

**Note:** Label all parts (original and new) before moving them.

- The cache directory card from the original storage adapter. Refer to Separating the 571F/575B card set and moving the cache directory card.
- The removable cache card from the original storage adapter. This applies only to certain adapters that have a removable cache card.

3. Has a new SRC of *xxxx9010* or *xxxx9050* occurred?

**No** Go to step 6 on page 194.

**Yes** Go to step 4

4. Was the new SRC *xxxx9050*?

**No** The new SRC was *xxxx9010*. Reclaim adapter cache storage. See Reclaiming IOP cache storage.

**Attention:** Data might be lost. When an auxiliary cache adapter connected to the RAID adapter logs a *xxxx9055* SRC in the hardware error log, the reclaim process does not result in lost sectors. Otherwise, the reclaim process does result in lost sectors.

**Note:** On the Reclaim Controller Cache Storage results screen, the number of lost sectors is displayed. If the number is 0, there is no data loss. If the number is not 0, data has been lost and the system operator might want to restore data after this procedure is completed.  
Go to step 6 on page 194.

**Yes:** Contact your hardware service provider. **This ends the procedure.**

5. If the server has been powered off for several days after an abnormal power-down, the cache battery pack might be depleted. Do not replace the adapter or the cache battery pack. Reclaim adapter cache storage. See Reclaiming IOP cache storage.

**Attention:** Data might be lost. When an auxiliary cache adapter connected to the RAID adapter logs a *xxxx9055* SRC in the hardware error log, the reclaim process does not result in lost sectors. Otherwise, the reclaim process does result in lost sectors.

**Note:** On the Reclaim Controller Cache Storage results screen, the number of lost sectors is displayed. If the number is 0, there is no data loss. If the number is not 0, data has been lost and the system operator might want to restore data after this procedure is completed.

**This ends the procedure.**

6. Using the appropriate service procedures, remove the adapter. Install the new replacement storage adapter with the following parts installed on it:
  - The cache directory card from the new storage adapter. Refer to Separating the 571F/575B card set and moving the cache directory card.
  - The removable cache card from the new storage adapter. This only applies to certain adapters which have a removable cache card.

**This ends the procedure.**

## SIP3121

Use this procedure to resolve the following problem: RAID adapter resources not available due to previous problems (SRC xxxx9054).

Power off the system and remove all new or replacement disk units. IPL the system to DST. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

Look for Product Activity Log entries for other reference codes and take action on them. **This ends the procedure.**

## SIP3130

Use this procedure to resolve the following problem: Adapter does not support function expected by one or more disk units (SRC xxxx9008).

1. Identify the affected adapter and disk units by examining the Product Activity Log. Perform the following:
  - a. Access SST or DST.
    - If you can enter a command at the console, access system service tools (SST). See System service tools.
    - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
    - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
  - b. Access the product activity log and record address information.

### **If a type D IPL was not performed to get to SST or DST:**

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the "Additional Information" to record the formatted log information. The Device Errors Detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

### **If a type D IPL was performed to get to DST:**

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

**BBBB** Hexadecimal offsets 4C and 4D

**Cc** Hexadecimal offset 51

**bb** Hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see More information from hexadecimal reports. The Device Errors Detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

- c. Determine the location of the adapter and the devices that are causing the problem. See System FRU locations and find the diagram of the system unit or the expansion unit. Then find the following items:

- The card slot that is identified by the direct select address (DSA)
- The disk unit locations that are identified by the unit addresses

Have you determined the location of the adapter and the devices that are causing the problem?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** Continue with the next step.

2. Have the adapter or disk units been physically moved recently, or were the disk units previously used by the AIX or Linux operating system?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** Continue with the next step.

3. Perform one of the following options (listed in order of preference):

**Option 1**

Power off the system or partition and restore the adapter and disk units back to their original configuration. **This ends the procedure.**

**Option 2**

If the data on the disk units is not needed, initialize and format the disk units by performing the following steps:

**Attention:** Data on the disk unit will be lost.

**If a type D IPL was not performed to get to SST or DST:**

- a. Access SST or DST.
- b. Select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

**If a type D IPL was performed to get to DST:**

- a. Access DST.
- b. Select **Work with disk units**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

## SIP3131

Use this procedure to resolve the following problem: Required cache data cannot be located for one or more disk units (SRC xxxx9050).

1. Did you just exchange the adapter as the result of a failure?

**No:** Go to step 3.

**Yes: Attention:**

- a. The failed adapter that you have just exchanged contains cache data that is required by the disk units that were attached to that adapter. If the adapter that you just exchanged is failing intermittently, reinstalling it and performing an IPL of the system might allow the data to be successfully written to the disk units. After the cache data is written to the disk units and the system is powered off normally, the adapter can be replaced without data being lost. Otherwise, continue with this procedure.
- b. Label all parts (old and new) before moving them.

Go to step 2.

2. Using the appropriate service procedures, remove the adapter. Install the new replacement storage adapter with the following parts installed on it:
  - The cache directory card from the original storage adapter. Refer to Separating the 571F/575B card set and moving the cache directory card.
  - The removable cache card from the original storage adapter. This applies only to certain adapters that have a removable cache card.

Go to step 8 on page 198.

3. Identify the affected adapter and disk units by examining the Product Activity Log. Perform the following:

a. Access SST/DST.

- If you can enter a command at the console, access system service tools (SST). See System service tools.
- If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

b. Access the product activity log and record address information.

**If a type D IPL was not performed to get to SST/DST:**

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. The Device Errors detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

**If a type D IPL was performed to get to DST:**

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

**BBBB** Hexadecimal offsets 4C and 4D

**Cc** hHexadecimal offset 51

**bb** Hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see More information from hexadecimal reports. The Device Errors Detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

- c. Determine the location of the adapter and the devices that are causing the problem. See System FRU locations and find the diagram of the system unit or the expansion unit. Then find the following items:

- The card slot that is identified by the direct select address (DSA)
- The disk unit locations that are identified by the unit addresses

Have you determined the location of the adapter and the devices that are causing the problem?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** Continue with the next step.

4. Have the adapter or disk units been physically moved recently?

**No:** Contact your hardware service provider.

**Yes:** Go to step 5.

5. Is the data on the disk units needed for this or any other system?

**No:** Go to step 7.

**Yes:** Go to step 6

6. Restore the adapter and disk units back to their original configuration. The adapter and disk units must be rejoined so that the cache data can be written to the disk units.

After the cache data is written to the disk units and the system is powered off normally, the adapter or disk units can be moved to another location. **This ends the procedure**

7. Perform only one of the following options, listed in the order of preference:

**Option 1**

Reclaim adapter cache storage. See Reclaiming IOP cache storage.

**Attention:** Data on the disk array will be lost.

**This ends the procedure.**

**Option 2**

If the data on the disk units is not needed, initialize and format the disk units by performing the following steps:

**Attention:** Data on the disk units will be lost.

**If a type D IPL was not performed to get to SST or DST:**

- a. Access SST or DST.
- b. Select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures**.
- c. Select Initialize and format disk unit for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

**If a type D IPL was performed to get to DST:**

- a. Access DST.

- b. Select Work with disk units.
- c. Select Initialize and format disk unit for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

8. Has a new SRC *xxxx9010* or *xxxx9050* occurred?

**No:** Go to step 10.

**Yes:** Go to step 9.

9. Was the new SRC *xxxx9050*?

**No:** The new SRC was *xxxx9010*.

Reclaim adapter cache storage. See Reclaiming IOP cache storage..

**Attention:** Data might be lost. When an auxiliary cache adapter connected to the RAID adapter logs an *xxxx9055* SRC in the hardware error log, the reclaim process does not result in lost sectors. Otherwise, the reclaim process does result in lost sectors.

**Note:** On the Reclaim Controller Cache Storage results screen, the number of lost sectors is displayed. If the number is 0, there is no data loss. If the number is not 0, data has been lost and the system operator might want to restore data after this procedure is completed.  
Go to step 10

**Yes:** Contact your hardware service provider.

10. Using the appropriate service procedures, remove the adapter. Install the new replacement storage adapter with the following parts installed on it:

- The cache directory card from the new storage adapter. Refer to Separating the 571F/575B card set and moving the cache directory card.
- The removable cache card from the new storage adapter. This only applies to certain adapters that have a removable cache card.

**This ends the procedure.**

## SIP3132

Use this procedure to resolve the following problem: Cache data exists for one or more missing or failed disk units (SRC *xxxx9051*).

The possible causes are:

- One or more disk units have failed on the adapter.
- One or more disk units were either moved concurrently or were removed after an abnormal power off.
- The adapter was moved from a different system or a different location on this system after an abnormal power off.
- The cache of the adapter was not cleared before it was shipped to the customer.

1. Identify the affected adapter and disk units by examining the product activity log. Perform the following:

a. Access SST or DST.

- If you can enter a command at the console, access system service tools (SST). See System service tools.
- If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

- b. Access the Product Activity Log and record address information.

**If a type D IPL was not performed to get to SST or DST:**

The log information is formatted. Access the product activity log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. The Device Errors Detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

**If a type D IPL was performed to get to DST:**

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

**BBBB** Hexadecimal offsets 4C and 4D

**Cc** Hexadecimal offset 51

**bb** Hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see More information from hexadecimal reports. The Device Errors Detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

- c. Determine the location of the adapter and the devices that are causing the problem. See System FRU locations and find the diagram of the system unit or the expansion unit. Then find the following items:

- The card slot that is identified by the direct select address (DSA)
- The disk unit locations that are identified by the unit addresses

Have you determined the location of the adapter and the devices that are causing the problem?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** Continue with the next step.

2. Are there other disk unit or adapter errors that have occurred at approximately the same time as this error?

**No:** Go to step 3.

**Yes:** Go to step 6 on page 200.

3. Is the data on the disk units (and thus the cache data for the disk units) needed for this or any other system?

**No:** Go to step 7 on page 200.

**Yes:** Go to step 4

4. Have the adapter card or disk units been physically moved recently?

**No:** Contact your hardware service provider.

**Yes:** Go to step 5 on page 200.

5. Restore the adapter and disk units back to their original configuration. The adapter and disk units must be rejoined so that the cache data can be written to the disk units.  
After the cache data is written to the disk units and the system is powered off normally, the adapter or disk units can be moved to another location. **This ends the procedure.**
6. Take action on the other errors that have occurred at the same time as this error. **This ends the procedure.**
7. Reclaim adapter cache storage. See Reclaiming IOP cache storage.  
**Attention:** Data will be lost. **This ends the procedure.**

## SIP3134

Use this procedure to resolve the following problem: Disk unit requires format before use (SRC xxxx9092).

The possible causes are:

- Disk unit is a previously failed disk unit from a disk array and was automatically replaced by a hot spare disk unit.
  - Disk unit is a previously failed disk unit from a disk array and was removed and later reinstalled on a different adapter or different location on this adapter.
  - Appropriate service procedures were not followed when replacing disk units or reconfiguring the adapter, such as not performing a normal power off of the system prior to reconfiguring disk units and adapters.
  - Disk unit is a member of a disk array, but was detected subsequent to the adapter being configured.
  - Disk unit has multiple or complex configuration problems.
1. Identify the affected adapter and disk units by examining the product activity log. Perform the following:
    - a. Access SST or DST.
      - If you can enter a command at the console, access system service tools (SST). See System service tools.
      - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
      - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
    - b. Access the product activity log and record address information.

### If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the product activity log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. The Device Errors Detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

### If a type D IPL was performed to get to DST:

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

**BBBB** Hexadecimal offsets 4C and 4D  
**Cc** Hexadecimal offset 51  
**bb** Hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see More information from hexadecimal reports. The Device Errors detected field indicates the total number of disk units that are affected. The Device Errors logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and Worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and Worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

- c. Determine the location of the adapter and the devices that are causing the problem. See System FRU locations and find the diagram of the system unit, or the expansion unit. Then find the following items:
  - The card slot that is identified by the direct select address (DSA)
  - The disk unit locations that are identified by the unit addresses

Have you determined the location of the adapter and the devices that are causing the problem?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** Continue with the next step.

2. Are there other disk unit or adapter errors that have occurred at about the same time as this error?

**No:** Go to step 3.

**Yes:** Go to step 5.

3. Have the adapter card or disk units been physically moved recently?

**No:** Go to step 4.

**Yes:** Go to step 6.

4. Is the data on the disk units needed for this or any other system?

**No:** Go to step 7.

**Yes:** Go to step 6.

5. Take action on the other errors that have occurred at the same time as this error. **This ends the procedure.**

6. Perform one of the following options that is most applicable to your situation:

**Option 1**

Perform the following to cause the adapter to rediscover the devices and connections:

- a. Use Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
- b. Vary on any other resources attached to the virtual I/O processor.

Take action for any other errors that are now occurring. **This ends the procedure.**

**Option 2**

Power off the system or partition and restore the adapter and disk units to their original configuration. **This ends the procedure.**

**Option 3**

Remove the disk units from this adapter. **This ends the procedure.**

7. Do the following to format the disk units:

**Attention:** All data on the disk units will be lost.

**If a type D IPL was not performed to get to SST or DST:**

- a. Access SST or DST.
- b. Select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures.**

- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a type D IPL was performed to get to DST:

- a. Access DST.
- b. Select **Work with disk units**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

## SIP3140

Use this procedure to resolve the following problem: Multiple adapters connected in an invalid configuration (SRC xxx9073)

The possible causes are:

- Incompatible adapters are connected to each other. This includes invalid adapter combinations such as the following:
  - Adapters with different write cache sizes
  - One adapter is not supported by i5/OS
  - An adapter that does not support auxiliary cache is connected to an auxiliary cache adapter
  - An adapter that supports Dual Storage IOAs is connected to another adapter which does not have the same support
  - Greater than 2 adapters are connected for Dual Storage IOAs
  - Adapter code levels are not up to date or are not at the same level of functionality
- One adapter, of a connected pair of adapters, is not operating under the i5/OS operating system. Connected adapters must both be controlled by i5/OS. Additionally, both adapters must be in the same system partition.
- Adapters connected for Dual Storage IOAs are not cabled correctly. Each type of Dual Storage IOA configuration requires specific cables be used in a supported manner.

Determine which of the possible causes applies to the current configuration and take the appropriate actions to correct it. If this does not correct the error, contact your hardware service provider. **This ends the procedure.**

## SIP3141

Use this procedure to resolve the following problem: Multiple adapters not capable of similar functions or controlling same set of devices (SRC xxx9074)

1. This error relates to adapters connected in a Dual Storage IOA configuration. To obtain the reason or description for this failure, you must find the formatted error information in the Product Activity Log. This should also contain information about the connected adapter.

Perform the following:

- a. Access SST/DST.
  - If you can enter a command at the console, access system service tools (SST). See System service tools.
  - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
  - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Access the Product Activity Log and record address information.

**If a D IPL was NOT performed to get to SST/DST:**

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for "Address Information". This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the "Additional Information" to record the formatted log information. The Problem description field indicates the type of problem. The type, serial number, and Worldwide ID of the connected adapter is also available.

**If a D IPL was performed to get to DST:**

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

**BBBB** hexadecimal offsets 4C and 4D

**Cc** hexadecimal offset 51

**bb** hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses. See More information from hexadecimal reports. The Problem description field indicates the type of problem. The type, serial number, and Worldwide ID of the connected adapter is also available.

2. Find the problem description and information for the connected adapter (remote adapter) shown in the error log, and perform the action listed for the reason in the following table:

*Table 53. RAID array reason for failure*

<b>Problem description</b>	<b>Full description</b>	<b>Action</b>	<b>Adapter on which to perform the action</b>
Secondary does not support RAID level being used by primary.	Secondary adapter detected that the primary has a RAID array with a RAID level that the secondary does not support.	Customer needs to upgrade the type of secondary adapter or change the RAID level of the array on the primary to a level that is supported by the secondary.	Physically change the type of adapter that logged the error. Change RAID level on primary adapter (remote adapter indicated in the error log).
Secondary does not support disk unit function being used by primary.	Secondary adapter detected a device function that it does not support.	Customer might need to upgrade the adapter code or upgrade the type of secondary adapter.	Adapter that logged the error.
Secondary is unable to find devices found by the primary.	Secondary adapter cannot discover all the devices that the primary has.	Verify the connections to the devices from the adapter logging the error.  View the disk units under each adapter using HSM to determine the SAS port with the problem.	Adapter that logged the error.
Secondary found devices not found by the primary.	Secondary adapter has discovered more devices than the primary. After this error is logged, an automatic failover will occur.	Verify the connections to the devices from the remote adapter as indicated in the error log.  View the disk units under each adapter using HSM to determine the SAS port with the problem.	Remote adapter indicated in the error log.

Table 53. RAID array reason for failure (continued)

Problem description	Full description	Action	Adapter on which to perform the action
Secondary port not connected to the same numbered port on primary.	SAS connections from the adapter to the devices are incorrect. Common disk expansion drawers must be connected to the same numbered SAS port on both adapters.	Verify connections and re-cable SAS connections as necessary.	Either adapter.
Primary lost contact with disk units accessible by secondary.	Link failure from primary adapter to devices. An automatic failover will occur.	Verify cable connections from the adapter which logged the error. Possible disk expansion drawer failure.	Adapter that logged the error.
Other	Not currently defined.	Contact your hardware service provider.	

This ends the procedure.

## SIP3142

Use this procedure to resolve the following configuration error: incorrect connection between cascaded enclosures (SRC xxxx4010).

The possible causes are:

- Incorrect cabling of cascaded device enclosures
- Use of an unsupported device enclosure

Considerations:

- To prevent hardware damage, power off the system, partition, or card slot as appropriate, before connecting and disconnecting cables or devices.
1. Identify the affected adapter and its port by examining the product activity log. Perform the following steps:
    - a. Access SST or DST.
      - If you can enter a command at the console, access system service tools (SST). See System service tools.
      - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
      - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
    - b. Access the product activity log and record address information.

### If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the product activity log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional Information to record the formatted log information. The Adapter Port field indicates the port on the adapter reporting the problem. There might be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

**If a type D IPL was performed to get to DST:**

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

**BBBB** Hexadecimal offsets 4C and 4D

**Cc** Hexadecimal offset 51

**bb** Hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see More information from hexadecimal reports. The Adapter Port field indicates the port on the adapter reporting the problem. There might be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

- c. Determine the location of the adapter that reported the problem. See System FRU locations and find the diagram of the system unit or the expansion unit. Then find the following items:
  - The card slot that is identified by the direct select address (DSA)
  - The physical connector identified by the port number found on the adapter tailstock

Have you determined the location of the adapter and its port?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** Continue with the next step.

2. Review the device enclosure cabling and correct the cabling as required for the device or device enclosure attached to the identified adapter port. To see example device configurations with SAS cabling, see "Serial-attached SCSI cable planning," in the Site and hardware planning information. If unsupported device enclosures are attached, then either remove or replace them with supported device enclosures.
3. Perform the following to cause the adapter to rediscover the devices and connections:
  - a. Use Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
  - b. Vary on any other resources attached to the virtual I/O processor.

Did the error recur?

**No:** **This ends the procedure.**

**Yes:** Contact your hardware service provider. **This ends the procedure.**

## **SIP3143**

Use this procedure to resolve the following configuration error: connections exceed adapter design limits (SRC xxxx4020).

The possible causes are:

- Unsupported number of cascaded device enclosures
- Improper cabling of cascaded device enclosures

Considerations:

- To prevent hardware damage, power off the system, partition, or card slot as appropriate, before connecting and disconnecting cables or devices.
1. Identify the affected adapter and its port by examining the product activity log. Perform the following:
    - a. Access SST or DST.

- If you can enter a command at the console, access system service tools (SST). See System service tools.
  - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
  - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Access the product activity log and record address information.

**If a type D IPL was not performed to get to SST or DST:**

The log information is formatted. Access the product activity log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

**If a type D IPL was performed to get to DST:**

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

**BBBB** Hexadecimal offsets 4C and 4D

**Cc** Hexadecimal offset 51

**bb** Hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see More information from hexadecimal reports. The Adapter Port field indicates the port on the adapter reporting the problem. There might be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

- c. Determine the location of the adapter that reported the problem. See System FRU locations and find the diagram of the system unit or the expansion unit. Then find the following items:
- The card slot that is identified by the direct select address (DSA)
  - The physical connector identified by the port number found on the adapter tailstock

Have you determined the location of the adapter and its port?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** Continue with the next step.

2. Reduce the number of cascaded device enclosures. Device enclosures can only be cascaded one level deep, and only in certain configurations. Review the device enclosure cabling and correct the cabling as required for the device or device enclosure attached to the identified adapter port. To see example device configurations with SAS cabling, see "Serial-attached SCSI cable planning," in the Site and hardware planning information.
3. Perform the following to cause the adapter to recover the devices and connections:
  - a. Use Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
  - b. Vary on any other resources attached to the virtual I/O processor.

Did the error recur?

**No:** **This ends the procedure.**

**Yes:** Contact your hardware service provider. **This ends the procedure.**

## SIP3144

Use this procedure to resolve problems with multipath connections.

This procedure is used to resolve the following configuration errors:

- Configuration error, incorrect multipath connection (SRC xxxx4030)
- Configuration error, incomplete multipath connection between adapter and enclosure detected (SRC xxxx4040)

The possible causes are:

- Incorrect cabling to device enclosure.

**Note:** Pay special attention to the requirement that a Y0-cable, YI-cable, or X-cable must be routed along the right side of the rack frame (as viewed from the rear) when connecting to a disk expansion drawer. Review the device enclosure cabling and correct the cabling as required. To see example device configurations with serial attached SCSI (SAS) cabling, see "Serial-attached SCSI cable planning," in the Site and hardware planning, .

- A failed connection caused by a failing component in the SAS fabric between, and including, the adapter and device enclosure.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
- Some systems have SAS, PCI-X, and PCIe bus interface logic integrated onto the system boards and use a pluggable RAID Enablement Card (a non-PCI form factor card) for these SAS, PCI-X, and PCIe buses. For these configurations, replacement of the RAID Enablement Card is unlikely to solve a SAS related problem because the SAS interface logic is on the system board.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations the SAS connections are integrated onto the system boards and a failed connection can be the result of a failed system board or integrated device enclosure.
- Some configurations involve a SAS adapter connecting to internal SAS disk enclosures within a system using a cable card. Keep in mind that when the procedure refers to a device enclosure, it could be referring to the internal SAS disk slots or media slots. Also, when the procedure refers to a cable, it could include a cable card.
- When using SAS adapters in a Dual Storage IOA configuration, ensure that the actions taken in this procedure are against the primary adapter (that is, not the secondary adapter).

**Attention:** When SAS fabric problems exist, replacing RAID adapters is not recommended without assistance from your service provider. Because the adapter might contain non-volatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.

1. Was the SRC xxxx4030?

**No:** Go to step 5 on page 208.

**Yes:** Go to step 2.

2. Identify the affected adapter and its port by examining the product activity log. Perform the following:

a. Access SST or DST.

- If you can enter a command at the console, access system service tools (SST). See System service tools.
- If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

- b. Access the product activity log and record address information.

**If a type D IPL was not performed to get to SST or DST:**

The log information is formatted. Access the product activity log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

**If a type D IPL was performed to get to DST:**

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

**BBBB** Hexadecimal offsets 4C and 4D

**Cc** Hexadecimal offset 51

**bb** hHexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see More information from hexadecimal reports. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

- c. Determine the location of the adapter that reported the problem. See System FRU locations and find the diagram of the system unit or the expansion unit. Then find the following items:
- The card slot that is identified by the direct select address (DSA)
  - The physical connector identified by the port number found on the adapter tailstock

Have you determined the location of the adapter and its port?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** Continue with the next step.

3. Review the device enclosure cabling and correct the cabling as required for the device or device enclosure attached to the identified adapter port. To see example device configurations with SAS cabling, see Serial-attached SCSI cable planning, in the Site and hardware planning information.
4. Perform the following to cause the adapter to rediscover the devices and connections:
- a. Use Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
  - b. Vary on any other resources attached to the virtual I/O processor.

Did the error recur?

**No:** **This ends the procedure.**

**Yes:** Contact your hardware service provider. **This ends the procedure.**

5. The SRC is xxxx4040. Determine if a problem still exists for the adapter that logged this error by examining the SAS connections as follows:
- a. On the System Service Tools (SST) screen, select **Start a Service Tool** then press Enter.
  - b. Select **Display/Alter/Dump**.
  - c. Select **Display/Alter storage**.
  - d. Select **Licensed Internal Code (LIC) data**.
  - e. Select **Advanced Analysis**.

- f. Type FABQUERY on the entry line and then select it with option 1.
- g. On the Specify Advanced Analysis Options screen, type -SUB 01 -IOA DCxx -DSP 0 in the Options field, where DCxx is the adapter resource name. Press Enter.

**Note:** More information is available by returning to the Specify Advanced Analysis Options screen and typing -SUB 01 -IOA DCxx -DSP 2 in the Options field, where DCxx is the adapter resource name. Press Enter.

Do all expected devices appear in the list and are all paths marked as Operational?

**No:** Continue with the next step.

**Yes:** The error condition no longer exists. **This ends the procedure.**

6. Perform the following to cause the adapter to rediscover the devices and connections:
  - a. Use Hardware Service Manager to re-IPL the virtual I/O processor that is associated with this adapter.
  - b. Vary on any other resources attached to the virtual I/O processor.

**Note:** At this point, ignore any problems found and continue with the next step.

7. Determine if the problem still exists for the adapter that logged this error by examining the SAS connections by performing the actions in step 5 on page 208 again.

Do all expected devices appear in the list and are all paths marked as Operational?

**NO** Go to step 8.

**YES** **This ends the procedure.**

8. Because the problem persists, some corrective action is needed to resolve the problem. Proceed by doing the following:

Perform only one of the following corrective actions (listed in the order of preference). If one of the corrective actions has previously been attempted, proceed to the next one in the list.

- Reseat cables if present on adapter and device enclosure. Perform the following:
    - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
    - b. Reseat the cables.
    - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
  - Replace the cable, if present, from the adapter to the device enclosure. Perform the following:
    - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
    - b. Replace the cables.
    - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
  - Replace the internal device enclosure or refer to the service documentation for an external expansion drawer. Perform the following steps:
    - a. Power off the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power off the adapter slot.
    - b. Replace the device enclosure.
    - c. Power on the system or partition. If the enclosure is external, use adapter concurrent maintenance instead to power on the adapter slot.
  - Replace the adapter. The procedure to replace the adapter can be found in Disk drive.
  - Contact your service provider.
9. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 5 on page 208 again. Do all expected devices appear in the list and are all paths marked as Operational?

**No:** Go to step 8 on page 209.

**Yes:** This ends the procedure.

## SIP3145

Use this procedure to resolve the following problem: Unsupported enclosure function detected (SRC xxxx4110).

The possible causes are:

- Device enclosure or adapter code levels are not up to date.
- Unsupported type of device enclosure or device.

Considerations:

To prevent hardware damage or erroneous diagnostic results, remove power from the system as appropriate before connecting and disconnecting cables or devices.

1. Identify the affected adapter and its port by examining the product activity log. Perform the following:

a. Access SST or DST.

- If you can enter a command at the console, access system service tools (SST). See System service tools.
- If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

b. Access the product activity log and record address information.

**If a type D IPL was not performed to get to SST or DST:**

The log information is formatted. Access the product activity log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. The Adapter Port field indicates the port on the adapter that is reporting the problem. There may be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

**If a type D IPL was performed to get to DST:**

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

**BBBB** Hexadecimal offsets 4C and 4D

**Cc** Hexadecimal offset 51

**bb** Hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see More information from hexadecimal reports. The Adapter Port field indicates the port on the adapter reporting the problem. There might be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

- c. Determine the location of the adapter that reported the problem. See System FRU locations and find the diagram of the system unit or the expansion unit. Then find the following items:
- The card slot that is identified by the direct select address (DSA)

- The physical connector identified by the port number found on the adapter tailstock  
Have you determined the location of the adapter and its port?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** Continue with the next step.

2. Check for the latest PTFs for the device enclosure or adapter and apply them. If unsupported device enclosures or devices are attached, then either remove or replace them with supported device enclosures or devices.

Review the device enclosure cabling and correct the cabling as required for the device or device enclosure attached to the identified adapter port. To see example device configurations with SAS cabling, see *Serial-attached SCSI cable planning*, in the Site and hardware planning information.

3. Perform the following to cause the adapter to rediscover the devices and connections:
  - a. Use Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
  - b. Vary on any other resources attached to the virtual I/O processor.

Did the error recur?

**No:** **This ends the procedure.**

**Yes:** Contact your hardware service provider. **This ends the procedure.**

## SIP3146

Use this procedure to resolve the configuration error: Incomplete multipath connection between enclosures and device detected (SRC xxxx4041).

The possible cause is a failed connection caused by a failing component within the device enclosure, including the device itself.

**Note:** The adapter is not a likely cause of this problem.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations the SAS connections are integrated onto the system boards and a failed connection can be the result of a failed system board or integrated device enclosure.
- Some configurations involve a serial attached SCSI (SAS) adapter connecting to internal SAS disk enclosures within a system using a cable card. Keep in mind that when the procedure refers to a device enclosure, it could be referring to the internal SAS disk slots or media slots. Also, when the procedure refers to a cable, it could include a cable card.
- When using SAS adapters in a Dual Storage IOA configuration, ensure that the actions taken in this procedure are against the primary adapter (that is, not the secondary adapter).

**Attention:** Removing functioning disk units in a disk array is not recommended without assistance from your service provider. If functioning disk units are removed, a disk array might become unprotected or failed and additional problems could be created.

1. Determine the resource name of the adapter that reported the problem by performing the following:
  - a. Access SST or DST.
  - b. Access the product activity log and record the resource name that this error is logged against. If the resource name is an adapter resource name, use it and continue with the next step. If the resource name is a disk unit resource name, use Hardware Service Manager to determine the resource name of the adapter that is controlling this disk unit.

2. Determine if a problem still exists for the adapter that logged this error by examining the SAS connections as follows:
  - a. On the System Service Tools (SST) display, select **Start a Service Tool**, and then press Enter.
  - b. Select **Display/Alter/Dump**.
  - c. Select **Display/Alter storage**.
  - d. Select **Licensed Internal Code (LIC) data**.
  - e. Select **Advanced Analysis**.
  - f. Type FABQUERY on the entry line and then select it with option 1.
  - g. On the Specify Advanced Analysis Options screen, type -SUB 01 -IOA DCxx -DSP 0 in the Options field, where DCxx is the adapter resource name. Press Enter.

**Note:** More information is available by returning to the Specify Advanced Analysis Options screen and typing -SUB 01 -IOA DCxx -DSP 2 in the Options field, where DCxx is the adapter resource name. Press Enter.

Do all expected devices appear in the list and are all paths marked as Operational?

**No:** Continue with the next step.

**Yes:** The error condition no longer exists. **This ends the procedure.**

3. Perform the following steps to cause the adapter to rediscover the devices and connections:

**Note:** Performing this step causes your system partition to temporarily hang when using the i5/OS operating system. Be patient, the system does work itself past the temporary hang.

- a. Use Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
  - b. Vary on any other resources attached to the virtual I/O processor.
4. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 2 again. Do all expected devices appear in the list and are all paths marked as Operational?

**No:** Continue with the next step.

**Yes:** The error condition no longer exists. **This ends the procedure.**

5. Perform only one of the following corrective actions (listed in the order of preference). If one of the corrective actions has previously been attempted, proceed to the next one in the list.
  - Review the device enclosure cabling and correct the cabling as required. To see example device configurations with SAS cabling, see Serial-attached SCSI cable planning, in the Site and hardware planning information.
  - Reseat the cables, if present, on the adapter and the device enclosure. Perform the following steps:
    - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
    - b. Reseat the cables.
    - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
  - Replace the cable, if present, from the adapter to the device enclosure. Perform the following steps:
    - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
    - b. Replace the cables.
    - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
  - Replace the internal device enclosure or refer to the service documentation for an external expansion drawer. Perform the following steps:

- a. Power off the system or partition. If the enclosure is external, use adapter concurrent maintenance instead to power off the adapter slot.
  - b. Replace the device enclosure.
  - c. Power on the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power on the adapter slot.
  - Replace the adapter. The procedure to replace the adapter can be found in PCI adapter.
  - Contact your service provider.
6. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 2 on page 212 again. Do all expected devices appear in the list and are all paths marked as Operational?
- No:** Go to step 5 on page 212.
- Yes:** The error condition no longer exists. **This ends the procedure..**

## SIP3147

Use this procedure to resolve the following problem: Missing remote adapter (SRC xxxx9076)

1. An adapter attached in either an Auxiliary Cache or Dual Storage IOA configuration was not discovered in the allotted time. To obtain additional information about the configuration involved, locate the formatted log in the Product Activity Log.
  - a. Access SST/DST.
    - If you can enter a command at the console, access system service tools (SST). See System service tools.
    - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
    - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
  - b. Access the Product Activity Log and record address information.

### If a D IPL was NOT performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for "Address Information". This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the "Additional Information" to record the formatted log information. The "Type of adapter connection" field indicates the type of configuration involved.

### If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

**BBBB** hexadecimal offsets 4C and 4D

**Cc** hexadecimal offset 51

**bb** hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses. See More information from hexadecimal reports. The "Type of adapter connection" field indicates the type of configuration involved.

2. Determine which of the following is the cause of your specific error and take the appropriate actions listed. If this does not correct the error, contact your hardware service provider. The possible causes are:
  - An attached adapter for the configuration is not installed or is not powered on. Some adapters are required to be part of a Dual Storage IOA Configuration. Ensure that both adapters are properly installed and powered on.

- If this is an Auxiliary Cache or Dual Storage IOA configuration, then both adapters may not be in the same partition. Ensure that both adapters are assigned to the same partition.
- An attached adapter does not support the desired configuration.
- An attached adapter for the configuration is failed. Take action on the other errors that have occurred at the same time as this error.
- Adapter code levels are not up to date or are not at the same level of functionality. Ensure that the code for both adapters is at the latest level.

**Note:** The adapter that is logging this error will run in a performance degraded mode, without caching, until the problem is resolved.

**This ends the procedure.**

## SIP3148

Use this procedure to resolve the following problem: Attached enclosure does not support required multipath function (SRC xxx4050).

The possible cause is the use of an unsupported device enclosure.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
1. Identify the adapter and adapter port associated with the problem by examining the product activity log. Perform the following steps:
    - a. Access SST or DST.
      - If you can enter a command at the console, access system service tools (SST). See System service tools.
      - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
      - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
    - b. Access the product activity log and record address information.

### **If a type D IPL was not performed to get to SST or DST:**

The log information is formatted. Access the product activity log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

### **If a type D IPL was performed to get to DST:**

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

**BBBB** Hexadecimal offsets 4C and 4D

**Cc** Hexadecimal offset 51

**bb** Hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see More information from hexadecimal reports. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed because multiple

ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

- c. Determine the location of the adapter that reported the problem. See System FRU locations and find the diagram of the system unit or the expansion unit. Then find the following items:

- The card slot that is identified by the direct select address (DSA)
- The physical connector identified by the port number found on the adapter tailstock

Have you determined the location of the adapter and its port?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** Continue with the next step.

2. If unsupported device enclosures are attached to the identified adapter port, then either remove or replace them with supported device enclosures.
3. Perform the following steps to cause the adapter to rediscover the devices and connections:
  - a. Use Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
  - b. Vary on any other resources attached to the virtual I/O processor.

Did the error recur?

**No:** **This ends the procedure.**

**Yes:** Contact your hardware service provider. **This ends the procedure.**

## SIP3149

Use this procedure to resolve the following problem: Incomplete multipath connection between adapter and remote adapter (SRC xxxx9075)

The possible cause is incorrect cabling between SAS RAID adapters.

Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.

Review the device enclosure cabling and correct the cabling as required. To see example device configurations with SAS cabling. See Serial-attached SCSI cable planning.

**This ends the procedure.**

## SIP3150

Use this procedure to perform serial attached SCSI (SAS) fabric problem isolation.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
- Some systems have SAS, PCI-X, and PCIe bus interface logic integrated onto the system boards and use a pluggable RAID Enablement Card (a non-PCI form factor card) for these SAS, PCI-X, and PCIe buses. For these configurations, replacement of the RAID Enablement Card is unlikely to solve a SAS related problem because the SAS interface logic is on the system board.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations the SAS connections are integrated onto the system boards and a failed connection can be the result of a failed system board or integrated device enclosure.

**Attention:** When SAS fabric problems exist, obtain assistance from your hardware service provider:

- When SAS fabric problems exist, replacing RAID adapters is not recommended without assistance from your service provider. Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
- Removing functioning disk units in a disk array is not recommended without assistance from your service provider. A disk array might become unprotected or might fail if functioning disk units are removed. The removal of functioning disk units might also result in additional problems in the disk array.

1. Was the SRC *xxxx3020*?

**No:** Go to step 3.

**Yes:** Go to step 2.

2. The possible causes are:

- More devices are connected to the adapter than the adapter supports. Change the configuration to reduce the number of devices below what is supported by the adapter.
- A SAS device has been incorrectly moved from one location to another. Either return the device to its original location or move the device while the adapter is powered off.
- A SAS device has been incorrectly replaced by a SATA device. A SAS device must be used to replace a SAS device.

**This ends the procedure.**

3. Determine the status of the disk units in the array by doing the following steps:

- a. Access the product activity log and display the SRC that sent you here.
- b. Press the F9 key for address information. This is the adapter address.
- c. Return to the SST or DST main menu.
- d. Select **Work with disk units** → **Display disk configuration** → **Display disk configuration status**.
- e. On the Display disk configuration status screen, look for the devices attached to the adapter that was identified.

Is there a device that has a status of "RAID 5/Unknown", "RAID 6/Unknown", "RAID 5/Failed", or "RAID 6/Failed"?

**No:** Go to step 5.

**Yes:** Go to step 4

4. Other errors should have occurred related to the disk array having degraded protection. Take action on these errors to replace the failed disk unit and restore the disk array to a fully protected state.

**This ends the procedure.**

5. Have other errors occurred at the same time as this error?

**No:** Go to step 7.

**Yes:** Go to step 6

6. Take action on the other errors that have occurred at the same time as this error. **This ends the procedure.**

7. Was the SRC *xxxxFFFE*?

**No:** Go to step 10 on page 217.

**Yes:** Go to step 8.

8. Check for the latest PTFs for the device, device enclosure, and adapter and apply them. Did you find and apply a PTF?

**No:** Go to step 10 on page 217.

**Yes:** Go to step 9.

9. **This ends the procedure.**
10. Identify the adapter and adapter port associated with the problem by examining the product activity log. Perform the following:
  - a. Access SST or DST.
    - If you can enter a command at the console, access system service tools (SST). See System service tools.
    - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
    - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
  - b. Access the product activity log and display the SRC that sent you here. Record the adapter address and the adapter port by doing one of the following:
    - If the SRC is xxxxFFFE, press the F9 key for address information. The adapter address is the bus, board, card information. The port is shown in the I/O bus field. Convert the port value from decimal to hexadecimal.
    - Press the F9 key for address information. The adapter address is the bus, board, card information. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information, if available. The adapter port is characters 1 and 2 of the unit address. For example, if the unit address is 123456FF, the port would be 12.
    - Go to Hexadecimal product activity log data to obtain the address information. The adapter address is the bus, board, card information. The adapter port is characters 1 and 2 of the unit address. For example, if the unit address is 123456FF, the port would be 12.
11. Use the adapter address to find the location of the adapter (see System FRU locations). On the tailstock of the adapter, find the port identified in the previous step. This is the port that is used to attach the device, or device enclosure, that is experiencing the problem.
12. Because the problem persists, some corrective action is needed to resolve the problem. Proceed by doing the following:

Perform only one of the following corrective actions (listed in the order of preference). If one of the corrective actions has previously been attempted, proceed to the next one in the list.

  - Reseat cables, if present, on adapter and device enclosure. Perform the following steps:
    - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
    - b. Reseat the cables.
    - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
  - Replace the cable, if present, from the adapter to the device enclosure. Perform the following:
    - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
    - b. Replace the cables.
    - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
  - Replace the device. See Disk drive.

**Note:** If there are multiple devices with a path that is not Operational, then the problem is not likely to be with a device.

  - Replace the internal device enclosure or refer to the service documentation for an external expansion drawer. Perform the following:
    - a. Power off the system or partition. If the enclosure is external, use adapter concurrent maintenance instead to power off the adapter slot.
    - b. Replace the device enclosure.

- c. Power on the system or partition. If the enclosure is external, use adapter concurrent maintenance instead to power on the adapter slot.
  - Replace the adapter. The procedure to replace the adapter can be found in PCI adapter.
  - Contact your service provider.
13. Does the problem still occur after performing the corrective action?

**No: This ends the procedure.**

**Yes:** Go to step 12 on page 217.

## SIP3152

Use this procedure to resolve possible failed connection problems

This procedure is used to resolve the following problems:

- Multipath redundancy level is worse (SRC xxxx4060)
- Device bus fabric error (SRC xxxx4100)
- Temporary device bus fabric error (SRC xxxx4101)

The possible causes are:

- A failed connection caused by a failing component in the serial attached SCSI (SAS) fabric between, and including, the adapter and device enclosure.
- A failed connection caused by a failing component within the device enclosure, including the device itself.

**Note:** For SRC xxxx4060, the failed connection was previously working, and may have already recovered.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
- Some systems have SAS, PCI-X, and PCIe bus interface logic integrated onto the system boards and use a pluggable RAID Enablement Card (a non-PCI form factor card) for these SAS, PCI-X, and PCIe buses. For these configurations, replacement of the RAID Enablement Card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system board.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations the SAS connections are integrated onto the system boards and a failed connection can be the result of a failed system board or integrated device enclosure.
- Some configurations involve a SAS adapter connecting to internal SAS disk enclosures within a system using a cable card. Keep in mind that when the procedure refers to a device enclosure, it could be referring to the internal SAS disk slots or media slots. Also, when the procedure refers to a cable, it could include a cable card.
- When using SAS adapters in a Dual Storage IOA configuration, ensure that the actions taken in this procedure are against the primary adapter (not the secondary adapter).

**Attention:**

- When SAS fabric problems exist, replacing RAID adapters is not recommended without assistance from your service provider. Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
- Removing functioning disk units in a disk array is not recommended without assistance from your service provider. A disk array might become unprotected or might fail if functioning disk units are removed. The removal of functioning disk units might also result in additional problems in the disk array.

1. Determine the resource name of the adapter that reported the problem by performing the following:

- a. Access SST or DST.
  - b. Access the product activity log and record the resource name that this error is logged against. If the resource name is an adapter resource name, use it and continue with the next step. If the resource name is a disk unit resource name, use the Hardware Service Manager to determine the resource name of the adapter that is controlling this disk unit.
2. Determine if a problem still exists for the adapter that logged this error by examining the SAS connections as follows:
    - a. On the System Service Tools (SST) screen, select **Start a Service Tool** and then press Enter.
    - b. Select **Display/Alter/Dump**.
    - c. Select **Display/Alter storage**.
    - d. Select **Licensed Internal Code (LIC) data**.
    - e. Select **Advanced Analysis**.
    - f. Type FABQUERY on the entry line and then select it with option 1.
    - g. On the Specify Advanced Analysis Options screen, type -SUB 01 -IOA DCxx -DSP 0 in the Options field, where DCxx is the adapter resource name. Press Enter.

**Note:** More information is available by returning to the Specify Advanced Analysis Options screen and typing -SUB 01 -IOA DCxx -DSP 2 in the Options field, where DCxx is the adapter resource name. Press Enter.

Do all expected devices appear in the list and are all paths marked as Operational?

**No:** Continue with the next step.

**Yes:** The error condition no longer exists. **This ends the procedure.**

3. Perform the following to cause the adapter to rediscover the devices and connections:
  - a. Use Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
  - b. Vary on any other resources attached to the virtual I/O processor.
4. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 2 again. Do all expected devices appear in the list and are all paths marked as Operational?
 

**No:** Continue with the next step.

**Yes:** The error condition no longer exists. **This ends the procedure.**
5. Perform only one of the following corrective actions (listed in the order of preference). If one of the corrective actions has previously been attempted, then proceed to the next one in the list.
  - Reseat cables, if present, on adapter and device enclosure. Perform the following steps:
    - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
    - b. Reseat the cables.
    - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
  - Replace the cable, if present, from adapter to device enclosure. Perform the following steps:
    - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
    - b. Replace the cables.
    - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
  - Replace the device. See Disk drive.

**Note:** If there are multiple devices with a path that is not Operational, then the problem is not likely to be with a device.

- Replace the internal device enclosure or refer to the service documentation for an external expansion drawer. Perform the following steps:
    - a. Power off the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power off the adapter slot.
    - b. Replace the device enclosure.
    - c. Power on the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power on the adapter slot.
  - Replace the adapter. The procedure to replace the adapter can be found in PCI adapter.
  - Contact your service provider.
6. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 2 on page 219 again. Do all expected devices appear in the list and are all paths marked as Operational?
- No:** Go to step 5 on page 219.
- Yes:** The error condition no longer exists. **This ends the procedure..**

### **SIP3153**

Use this procedure to resolve possible failed connection problems.

Use isolation procedure “SIP3152” on page 218.

---

## Service processor isolation procedures

Use service processor isolation procedures if there is no HMC attached to the server. If the server is connected to an HMC, use the procedures that are available on the HMC to continue FRU isolation.

### DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

## FSPSP01

A part vital to system function has been deconfigured. Review the system error logs for errors that call out parts relevant to each reason code. If replacing those parts does not resolve the error, use this procedure.

Refer to System FRU locations for information on locating and then replacing any FRUs called out by the following procedures.

Perform the following steps:

1. Is SRC B1xxB10C or B1xxB10D (xx indicates that the Subsystem ID is irrelevant)?
  - **No:** Go to step 5.
  - **Yes:** The system has detected that one of the following has occurred:

- A memory controller that is required for the system to function is deconfigured.
- There is not enough memory.
- The memory DIMM is plugged incorrectly.

Continue with the next step.

2. Perform the following steps:

- a. Perform the action indicated in the table below for your system.

System:	Action:
8203-E4A, 9407-M15, and 9408-M25	Reseat all of the memory DIMMs on the system backplane but do not replace any memory DIMM at this time.
8204-E8A and 9409-M50	Reseat all of the memory DIMMs in each processor card but do not replace any memory DIMMs at this time.
8234-EMA, 9117-MMA, 9406-MMA	Reseat all of the memory DIMMs in each processor enclosure (primary and all secondary units) but do not replace any memory DIMMs at this time.
9125-F2A	Reseat all of the memory DIMMs in the system enclosure but do not replace any memory DIMMs at this time.
9119-FHA	Reseat all of the memory DIMMs in the each processor enclosure (primary and all secondary units) but do not replace any memory DIMMs at this time.

- b. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.

Does the problem persist?

**Yes:** Continue with the next step.

**No:** Go to Verify a repair. **This ends the procedure.**

3. Perform the action indicated in the table below for your system.

System:	Action:
8203-E4A, 9407-M15, and 9408-M25	<ol style="list-style-type: none"> <li>1. Replace the first memory DIMM quad.</li> <li>2. Perform a slow boot after replacing each memory DIMM quad. To review the "Performing a slow boot" procedure go to Performing a slow boot .</li> <li>3. Does the problem persist? <ul style="list-style-type: none"> <li><b>Yes:</b> Repeat this step and replace the second memory DIMM quad. If you have replaced both of the memory DIMM quads, then continue with the next step.</li> <li><b>No:</b> Go to Verify a repair. <b>This ends the procedure.</b></li> </ul> </li> </ol>
8204-E8A and 9409-M50	<ol style="list-style-type: none"> <li>1. Replace the first memory DIMM quad (for each processor card, starting with processor card 1).</li> <li>2. Perform a slow boot after replacing each memory DIMM quad. To review the "Performing a slow boot" procedure go to Performing a slow boot .</li> <li>3. Does the problem persist? <ul style="list-style-type: none"> <li><b>Yes:</b> Repeat this step and replace the next memory DIMM quad. If you have replaced all of the memory DIMM quads, then continue with the next step.</li> <li><b>No:</b> Go to Verify a repair. <b>This ends the procedure.</b></li> </ul> </li> </ol>

System:	Action:
8234-EMA, 9117-MMA, 9406-MMA	<ol style="list-style-type: none"> <li>1. Replace the first memory DIMM in the first processor enclosure.</li> <li>2. Perform a slow boot after replacing each FRU. To review the "Performing a slow boot" procedure go to Performing a slow boot.</li> <li>3. Does the problem persist? <ul style="list-style-type: none"> <li><b>Yes:</b> Repeat this step and replace the next memory DIMM. If you have replaced all of the memory DIMMs, then continue with the next step.</li> <li><b>No:</b> Go to Verify a repair. <b>This ends the procedure.</b></li> </ul> </li> </ol>
9125-F2A	<ol style="list-style-type: none"> <li>1. Replace the memory module.</li> <li>2. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.</li> <li>3. Does the problem persist? <ul style="list-style-type: none"> <li><b>Yes:</b> Repeat this step and replace the next memory module. If you have replaced all of the memory modules, then continue with the next step.</li> <li><b>No:</b> Go to Verify a repair. <b>This ends the procedure</b></li> </ul> </li> </ol>
9119-FHA	<ol style="list-style-type: none"> <li>1. Replace the memory DIMM.</li> <li>2. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.</li> <li>3. Does the problem persist? <ul style="list-style-type: none"> <li><b>Yes:</b> Repeat this step and replace the next memory DIMM. If you have replaced all of the memory DIMM, then continue with the next step.</li> <li><b>No:</b> Go to Verify a repair. <b>This ends the procedure.</b></li> </ul> </li> </ol>

4. Perform the action indicated in the table below for your system.

System:	Action:
8203-E4A, 9407-M15, and 9408-M25	<ol style="list-style-type: none"> <li>1. Replace the system backplane (Un-P1).</li> <li>2. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.</li> <li>3. Does the problem persist? <ul style="list-style-type: none"> <li><b>Yes:</b> Repeat this step and replace the second memory DIMM quad. If you have replaced both of the memory DIMM quads, then continue with the next step.</li> <li><b>No:</b> Go to Verify a repair. <b>This ends the procedure.</b></li> </ul> </li> </ol>
8204-E8A and 9409-M50	<ol style="list-style-type: none"> <li>1. Replace the first processor card, starting with processor card 1 (Un-P1-C13).</li> <li>2. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.</li> <li>3. Does the problem persist? <ul style="list-style-type: none"> <li><b>Yes:</b> Repeat this step and replace the next processor card. If you have replaced all of the processor cards, then contact your next level of support. <b>This ends the procedure.</b></li> <li><b>No:</b> Go to Verify a repair. <b>This ends the procedure.</b></li> </ul> </li> </ol>

System:	Action:
8234-EMA, 9117-MMA, 9406-MMA	<ol style="list-style-type: none"> <li>1. Replace the first processor card in the primary processor enclosure</li> <li>2. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.</li> <li>3. Does the problem persist? <ul style="list-style-type: none"> <li><b>Yes:</b> Contact your next level of support. <b>This ends the procedure.</b></li> <li><b>No:</b> Go to Verify a repair. <b>This ends the procedure.</b></li> </ul> </li> </ol>
9125-F2A	<ol style="list-style-type: none"> <li>1. Replace the processor backplane (Un-P2).</li> <li>2. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.</li> <li>3. Go to Verify a repair. <b>This ends the procedure</b></li> </ol>
9119-FHA	<ol style="list-style-type: none"> <li>1. Replace the processor book.</li> <li>2. Perform a slow boot between each replacement. To review the "Performing a slow boot" procedure go to Performing a slow boot.</li> <li>3. Go to Verify a repair. <b>This ends the procedure.</b></li> </ol>

5. Is SRC B1xxB107 or B1xxB108?

**Yes:** Perform the action indicated in the table below for your system.

**No:** Continue with the next step.

System:	Action:
8203-E4A, 9407-M15, and 9408-M25	The system has detected a problem with the clock module. Replace the system backplane (Un-P1). <b>This ends the procedure.</b>
8204-E8A and 9409-M50	The system has detected a problem with the clock module. Replace the system backplane (Un-P1). <b>This ends the procedure.</b>
8234-EMA, 9117-MMA, 9406-MMA	<p>The system has detected a problem with a clock module on one of the service processors.</p> <ol style="list-style-type: none"> <li>1. Starting in the primary processor enclosure and continuing in the secondary enclosures, replace the system processor cards one at a time (starting with P2-C1 then P2-C2) until the problem is resolved.</li> <li>2. Perform a slow boot after replacing each processor card. To review the "Performing a slow boot" procedure go to Performing a slow boot. <b>This ends the procedure.</b></li> </ol>
9125-F2A	<p>The system has detected a problem with a clock card. Perform the following:</p> <ol style="list-style-type: none"> <li>1. Replace the I/O backplane (Un-P1).</li> <li>2. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.</li> <li>3. Go to Verify a repair. <b>This ends the procedure</b></li> </ol>
9119-FHA	<p>The system has detected a problem with a CEC clock card. Perform the following for each of the CEC clock cards until the problem is resolved:</p> <ol style="list-style-type: none"> <li>1. Replace the CEC clock card.</li> <li>2. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.</li> <li>3. Go to Verify a repair. <b>This ends the procedure.</b></li> </ol>

6. Is SCR B1xxB106?

**Yes:** Perform the action indicated in the table below for your system.

System:	Action:
8203-E4A, 9407-M15, and 9408-M25	Replace the system backplane (Un-P1). 1. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot. 2. Go to Verify a repair. <b>This ends the procedure.</b>
8204-E8A and 9409-M50	Replace the system backplane (Un-P1). 1. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot. 2. Go to Verify a repair. <b>This ends the procedure.</b>
8234-EMA, 9117-MMA, 9406-MMA	Review the system error logs for errors that called out system backplanes. This will indicate which system backplanes have problems and need to be replaced. Replace the system backplane in the enclosure indicated by the logs. 1. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot. 2. Go to Verify a repair. <b>This ends the procedure.</b>
9125-F2A	Review the system error logs for errors that called out planars. This will indicate which planars have problems and need to be replaced. Replace the processor backplane (Un-P2) in the enclosure indicated by the logs. 1. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot. 2. Go to Verify a repair. <b>This ends the procedure.</b>
9119-FHA	Review the system error logs for errors that called out planars. This will indicate which planars have problems and need to be replaced. Replace the appropriate processor book or processor books. 1. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot. 2. Go to Verify a repair. <b>This ends the procedure.</b>

**No:** Continue with the next step.

7. Is SRC B1xxB110 or B1xxB111?

**No:** Contact your next level of support. This ends the procedure.

**Yes: Perform the action indicated in the table below for your system.**  
 Perform the action indicated in the table below for your system.

System:	Action:
8203-E4A, 9407-M15, and 9408-M25	Replace the system backplane (Un-P1). 1. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot. 2. Go to Verify a repair. <b>This ends the procedure.</b>
8204-E8A and 9409-M50	Replace the system backplane (Un-P1). 1. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot. 2. Go to Verify a repair. <b>This ends the procedure.</b>
8234-EMA, 9117-MMA, 9406-MMA	Review the system error logs for errors that called out I/O backplanes. This will indicate which I/O backplanes have problems and need to be replaced. Replace the I/O backplane in the enclosure indicated by the logs. 1. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot. 2. Go to Verify a repair. <b>This ends the procedure.</b>

System:	Action:
9125-F2A	<p>Review the system error logs for errors that called out I/O bridges. This will indicate which I/O bridges have problems and need to be replaced. Replace the appropriate processor backplane (Un-P2).</p> <ol style="list-style-type: none"> <li>1. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.</li> <li>2. Go to Verify a repair. <b>This ends the procedure.</b></li> </ol>
9119-FHA	<p>Review the system error logs for errors that called out I/O bridges. This will indicate which I/O bridges have problems and need to be replaced. Replace the appropriate processor book or processor books.</p> <ol style="list-style-type: none"> <li>1. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.</li> <li>2. Go to Verify a repair. <b>This ends the procedure.</b></li> </ol>

## FSPSP02

This procedure is for boot failures that terminate very early in the boot process.

This error path is indicated when the SRC data words are scrolling automatically through control panel functions 11, 12, and 13, and the control panel interface buttons are not responsive.

Perform the following:

1. Is the system an 9125-F2A or 9119-FHA?

**No:** Continue with the next step.

**Yes:** Save any error log and dump data and contact your next level of support for assistance. This ends the procedure

2. Push the white power button to reset the system and start it on the other side of platform LIC.

**Note:** The white power button will only reset the system and attempt to reach standby.

3. Did an SRC occur after starting the system on the other side?

**No:** Verify that the system's firmware is at the latest level. Update the system's firmware on the failing side if necessary. **This ends the procedure.**

**Yes:** Continue with the next step.

4. Is the SRC the same SRC that brought you to this procedure?

- **No:** Return to Start of Call to service this new SRC. **This ends the procedure.**

- **Yes:** Perform the action indicated in the table below for your system.

System:	Action:
8203-E4A, 9407-M15, and 9408-M25	<p>Replace the system backplane (Un-P1). Refer to System FRU locations to locate the correct system location of the part you are replacing. If the problem is not resolved, contact your next level of support. <b>This ends the procedure.</b></p>
8204-E8A and 9409-M50	<p>Replace the system backplane (Un-P1). Refer to System FRU locations to locate the correct system location of the part you are replacing. If the problem is not resolved, contact your next level of support. <b>This ends the procedure.</b></p>
8234-EMA, 9117-MMA, 9406-MMA	<ol style="list-style-type: none"> <li>1. Replace the service processor.</li> <li>2. If the problem persists, replace the system backplane. <b>This ends the procedure.</b></li> </ol>

## FSPSP03

A system operator or user error has occurred.

Refer to the documentation for the task that you were attempting to perform.

## FSPSP04

A problem has been detected in the service processor firmware.

Refer to ASMI and nonpartitioned systems (SA76-0094) or Managing the Hardware Management Console (SA76-0085) and verify that the system's firmware is at the latest level. Update the system's firmware if necessary.

## FSPSP05

The service processor has detected a problem in the platform firmware.

Refer to the *Operations Guide for ASMI and for Nonpartitioned Systems*, SA76-0094 **OR** the *Operations Guide for the Hardware Management Console and its Managed Systems*, SA76-0085 and verify that the system's firmware is at the latest level. Update the system's firmware if necessary.

## FSPSP06

The service processor reported a suspected intermittent problem.

Contact your next level of support.

## FSPSP07

The time of day has been reset to the default value.

1. To set the time of day, refer to the systems operations guide.
2. If the problem persists, perform the following:
  - a. Power off the system. See Powering on and powering off the system .
  - b. To determine the action to perform, use the following table:

System	Action
8203-E4A, 9407-M15, 9408-M25, 8204-E8A, 9409-M50, and 9125-F2A	Replace the time-of-day battery (Un-P1-E1). Refer to System FRU locations.
8234-EMA, 9117-MMA, 9406-MMA	Replace the time-of-day battery (Un-P1-C11-E1). Refer to System FRU locations.
9119-FHA	Replace the time-of-day battery. To determine which battery to replace, use the last byte in word 3 of the primary SRC. <ul style="list-style-type: none"><li>• If the last byte is a 10, then replace the CEC FSP card 0, time-of-day battery.</li><li>• If the last byte is a 20, then replace the CEC FSP card 1, time-of-day battery.</li></ul>

3. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

## FSPSP09

A problem has been detected with a memory DIMM, but it cannot be isolated to a specific memory DIMM.

1. Use the following table to determine the action to perform.

System	Action
8203-E4A, 9407-M15, and 9408-M25	Replace all the memory DIMMs on the system backplane. See System FRU locations for FRU location information.
8204-E8A and 9409-M50	Replace all the memory DIMMs that are located on the same processor card (starting with processor card 1: Un-P1-Cx-Cy, with x =1 through 4, and 5 through 9, and y =13 for processor card 1 through 16 for processor card 4). See System FRU locations for FRU location information.
8234-EMA, 9117-MMA, 9406-MMA	Using the FRU called out after this procedure, replace ALL the memory DIMMs that reside on the same memory board/card. See System FRU locations for FRU location information.
9125-F2A	Using the FRU called out after this procedure, replace ALL the memory modules that reside on the same memory board/card.
(9119-FHA	Using the FRU called out after this procedure, replace ALL the memory DIMMs that reside on the same memory board/card.

2. Perform a slow boot after replacing all the memory DIMMs. Refer to Performing a slow boot. **This ends the procedure.**

## FSPSP10

The part indicated in the FRU list that follows this procedure is not valid or missing for this system's configuration.

Refer to System FRU locations for information on FRU locations called out by the following procedure.

Perform the following to correct the problem:

- Does word 8 (the 8 leftmost characters in the 2nd line of function 13) of the reference code end with 02 or 04?  
**No:** Go to step 3.  
**Yes:** Continue with the next step.
- The FRU that is called out after this procedure is either missing or not valid. Is that FRU installed and connected or plugged in correctly?  
**Yes:** The installed FRU is not valid. Remove that FRU. Then contact your next level of support to determine the correct FRU. **This ends the procedure.**  
**No:** The FRU is missing. If the FRU is present but not connected, reconnect it and perform a slow boot. See Performing a slow boot. Otherwise, contact your next level of support to determine the missing FRU. **This ends the procedure.**
- Does word 8 end with 01 or 05?  
**No:** Return to the Start of Call. **This ends the procedure.**  
**Yes:** The FRU that is listed after this procedure has the same serial number as another FRU in the system. Remove all but one of the FRUs that are listed after this procedure and then perform a slow boot. See Performing a slow boot. **This ends the procedure.**

## FSPSP11

The service processor has detected an error on the RIO/HSL port in the system unit.

1. Verify that the system's firmware is at the latest level. Update the system's firmware if necessary.
2. If the problem persists, use the following table to determine the action to perform.

System	Action
8203-E4A, 9407-M15, 9408-M25, 8204-E8A, and 9409-M50	Replace the system backplane (Un-P1). Then perform a slow boot. See Performing a slow boot. <b>This ends the procedure.</b>
8234-EMA, 9117-MMA, 9406-MMA	Replace each I/O backplane one at a time. Perform a slow boot between each replacement until the problem is resolved. See Performing a slow boot. <b>This ends the procedure.</b>
9119-FHA	Replace the processor book. Perform a slow boot. See Performing a slow boot. <b>This ends the procedure.</b>

## FSPSP12

The DIMM FRU that was previously replaced did not correct the memory error.

Perform the following:

1. Power off the system. See Powering on and powering off the system .
2. To determine the action to perform, use the following table:

System	Action
8203-E4A, 9407-M15, and 9408-M25	Replace the system backplane (Un-P1). See System FRU locations for information on system FRU locations.
8204-E8A and 9409-M50	Replace the processor card that the DIMM is plugged into (Un-P1-C13 for processor card 1 through Un-P1-C16 for processor card 4). See System FRU locations for information on system FRU locations.
8234-EMA, 9117-MMA, 9406-MMA , and 9125-F2A	Replace the board DIMM is plugged into. See System FRU locations for information on system FRU locations.
9119-FHA	Replace the processor book with the failure.

3. Perform a slow boot. See Performing a slow boot.

**This ends the procedure.**

## FSPSP14

The service processor cannot communicate with the system firmware. The server firmware will continue to run the system and partitions while it attempts to recover communications. Server firmware recovery actions will continue for approximately 30 to 40 minutes.

Perform the following:

1. Record the time the log was created or when the SRC was first noticed. Continue with the next step.
2. Are progress codes being displayed on the panel?
  - **Yes:** Server firmware was able to reset the service processor. **This ends the procedure.**
  - **No:** Continue with the next step.
3. Has an A7006995 SRC been displayed on the panel?

- **Yes:** Partitions are being powered off and a server dump will be attempted. Follow the A7006995 SRC description if the partitions do not terminate as requested. **This ends the procedure.**
  - **No:** Continue with the next step.
4. Has the A1xx SRC remained on the panel for more than 40 minutes?
- **Yes:** Server firmware could not begin termination of the partitions. Contact your next level of support to assist in attempting to terminate any remaining partitions and forcing a server dump. Collect the dump for support, power off and power on the system. **This ends the procedure.**
  - **No:** Contact your next level of support. **This ends the procedure.**

## FSPSP16

Save any error log and dump data and contact your next level of support for assistance.

## FSPSP17

A system uncorrectable error has occurred.

1. Look for other serviceable events and use the call outs listed with them to correct the problem.
2. If you need to run the system in a degraded mode until you can perform the service actions, do the following:
  - a. Power off the system (see Powering on and powering off the system ).
  - b. Power on the system (see Powering on and powering off the system ) to allow the memory diagnostics to clean up the memory and deconfigure any defective parts.

**This ends the procedure.**

## FSPSP18

A problem has been detected in the platform LIC.

Refer to the Managing the Hardware Management Console, SA76-0085, or the ASMI and nonpartitioned systems, SA76-0094, and verify that the server firmware is at the latest level. Update the server firmware if necessary.

## FSPSP20

A failing item has been detected by a hardware procedure.

Performing a slow boot to run full hardware diagnostics.

If a new SRC occurs, repair the system using that reference code.

If an incomplete occurs, go to Managing the advanced system management interface (ASMI) menus to power off, check for deconfigured components and perform a slow boot.

**This ends the procedure.**

## FSPSP22

The system has detected that a processor chip is missing from the system configuration because JTAG lines are not working.

Refer to System FRU locations for instructions for removing and replacing any FRUs called out by the following procedure.

For 8203-E4A, 9407-M15, 9408-M25, 8204-E8A, and 9409-M50 perform the following.

1. Power off the system. See Powering on and powering off the system .

2. Replace the system backplane (Un-P1).
3. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

For **8234-EMA, 9117-MMA, 9406-MMA, and 9125-F2A** perform the following.

1. Power off the system. See Powering on and powering off the system .
2. Replace the service processor.
3. Perform a slow boot. See Performing a slow boot.
4. Does the problem persist?  
**No:** **This ends the procedure.**  
**Yes:** Continue with the next step.
5. Perform the following for each system processor until the problem is resolved:
  - a. Power off the system.
  - b. Replace one of the system processors.
  - c. Perform a slow boot after replacing each processor. See Performing a slow boot.  
**This ends the procedure.**

For **9119-FHA** perform the following.

1. Power off the system. See Powering on and powering off the system .
2. Replace the CEC FSP cards, one at a time.
3. Perform a slow boot. See Performing a slow boot.
4. Does the problem persist?  
**No:** **This ends the procedure.**  
**Yes:** Continue with the next step.
5. Perform the following for each system processor until the problem is resolved:
  - a. Power off the system.
  - b. Replace each MCM, one at a time.
  - c. Perform a slow boot after replacing each processor. See Performing a slow boot.  
**This ends the procedure.**

## **FSPSP23**

The system needs to perform a service processor dump.

1. Perform a service processor dump (see Performing a platform system dump or service processor dump).
2. Attempt to perform an IPL on the system.
3. Save the service processor dump to storage. See Managing dumps).
4. Contact your next level of support. **This ends the procedure.**

## **FSPSP24**

The system is running degraded. Array bit steering may be able to correct this problem without replacing hardware.

1. Power off the system (see Powering on and powering off the system ).
2. Go to Performing a slow boot. **This ends the procedure.**
3. If the problem persists, replace the FRU that is called out after this procedure. See System FRU locations for instructions. **This ends the procedure.**

## FSPSP25

The server has detected an over-temperature thermal fault.

1. Before replacing any server hardware FRU callouts, look in the error log for thermal problems related to fans, power supplies, etc. Perform all service actions for the thermal problem SRCs first before continuing with any other callouts in the current SRC. Thermal problems are associated with 1100 xxxx SRCs, where xxxx may be any of the following:
  - 1514
  - 1524
  - 7201
  - 7203
  - 7205
  - 7610
  - 7611
  - 7620
  - 7621
  - 7630
  - 7631
  - 7640
  - 7641
2. If no thermal-related SRCs or problems can be found, replace the server hardware FRU called out in the current SRC. See System FRU locations for instructions. **This ends the procedure.**

## FSPSP27

An attention line has been detected as having a problem. If the FRU replaced before this procedure did not correct the problem, perform the following:

Refer to System FRU locations to locate the correct system location of the part you are replacing.

To perform the correct FSPSP27 for the system that you are servicing, select your machine type and model (system) from among the following:

8203-E4A, 9407-M15, and 9408-M25  
8204-E8A and 9409-M50  
8234-EMA, 9117-MMA, and 9406-MMA  
9125-F2A  
9119-FHA

### 8203-E4A, 9407-M15, and 9408-M25

1. Was the FRU called out before this procedure a memory DIMM (Un-P1-C14 through Un-P1-C17 or Un-P1-C21 through Un-P1-C24) or a GX adapter card (Un-P1-C8 or Un-P1-C6)?  
**No:** **This ends the procedure.**  
**Yes:** Continue with the next step.
2. Perform the following:
  - a. Replace the system backplane (Un-P1).
  - b. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

### 8204-E8A and 9409-M50

1. Was the FRU called out before this procedure a Memory DIMM (Un-P1-C13-Cx or Un-P1-C14-Cx or Un-P1-C15-Cx or Un-P1-C16-Cx)?

**No:** Go to step 4.

**Yes:** Continue with the next step.

2. Perform the following:

a. Replace the processor card (Un-P1-C13 or Un-P1-C14 or Un-P1-C15 or Un-P1-C16) that the DIMM was plugged into.

b. Perform a slow boot

Does the problem persist?

**No:** **This ends the procedure.**

**Yes:** Continue with the next step.

3. Perform the following:

a. Replace the system backplane (Un-P1).

b. Perform a slow boot. See Performing a slow boot.

4. Was the FRU called out before this procedure a processor card (Un-P1-C13 or Un-P1-C14 or Un-P1-C15 or Un-P1-C16) or GX adapter card (Un-P1-C8 or Un-C1-C7)?

**No:** **This ends the procedure.**

**Yes:** Continue with the next step.

5. Perform the following:

a. Replace the system backplane (Un-P1).

b. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

**8234-EMA, 9117-MMA, and 9406-MMA**

1. Was the FRU called out before this procedure a memory DIMM (Un-P2-C1-Cx or Un-P2-C2-Cx)?

**No:** Go to step 10 .

**Yes:** A memory DIMM attention line has an error. Continue to the next step.

2. Replace the service processor (Un-P1-C11) from the same drawer as the memory DIMM.

3. Perform a slow boot. See Performing a slow boot.

4. Does the problem persist?

**No:** **This ends the procedure.**

**Yes:** Continue to the next step.

5. Replace the processor card (Un-P2-C1 or Un-P2-C2) on which you previously replaced DIMMs.

6. Perform a slow boot.

7. Does the problem persist?

**No:** **This ends the procedure.**

**Yes:** Continue with the next step.

8. Replace the system backplane (Un-P1) from the same drawer as the memory DIMM.

9. Perform a slow boot.

10. Was the FRU called out before this procedure a processor card (Un-P2-C1 or Un-P2-C2) or GX adapter card (Un-P1-C8 or Un-P1-C9)?

**No:** Go to step 16.

**Yes:** A processor card or GX adapter card attention line has an error. Continue to the next step.

11. Replace the service processor (Un-P1-C11) from the same drawer as the processor card or GX adapter card.

12. Perform a slow boot.

13. Does the problem persist?  
**No:** This ends the procedure.  
**Yes:** Continue with the next step.
14. Replace the system backplane (Un-P1) from the same drawer as the processor card or GX adapter card.
15. Perform a slow boot. Performing a slow boot. **This ends the procedure.**
16. Was the FRU called out before this the system backplane (Un-P1)?  
**No:** Contact your next level of support. **This ends the procedure.**  
**Yes:** A P5IOC2 attention line has an error. Continue to the next step.
17. Replace the service processor (Un-P1-C11) from the same drawer as the system backplane.
18. Perform a slow boot. **This ends the procedure.**

#### 9125-F2A

1. Was the FRU called out before this procedure a memory DIMM (Un-P2-Cx, where x = 1 - 64) or GX adapter card (Un-P2-C65 or Un-P2-C66)?  
**No:** Go to step 7.  
**Yes:** Continue to the next step.
2. Replace the I/O backplane (Un-P1).
3. Perform a slow boot. See Performing a slow boot.
4. Does the problem persist?  
**No:** This ends the procedure.  
**Yes:** Continue to the next step.
5. Replace the processor backplane (Un-P2).
6. Perform a slow boot.
7. Was the FRU called out before this procedure a processor (Un-P2-Cx, where x = 67 - 82) or processor backplane (Un-P2)?  
**No:** This ends the procedure.  
**Yes:** Continue with the next step.
8. Replace the I/O backplane (Un-P1).
9. Perform a slow boot. **This ends the procedure.**

#### 9119-FHA

1. Was the FRU called out before this procedure a memory DIMM (Un-Pm-Cx, where m = 2 - 9 and x = 1 - 36), a processor (Un-Pm-Cx, where m = 2 - 9 and x = 25 - 28), or GX adapter card (Un-Pm-Cx, where m = 2 - 9 and x = 37 - 40)?  
**No:** This ends the procedure.  
**Yes:** A Memory DIMM or Processor or GX Adapter Card attention line has an error. Continue to the next step.
2. Replace both Node FSP Cards (Un-Pm-C41 and Un-Pm-C42, where m = 2 - 9) from the same node as the memory DIMM, processor, or GX adapter card.
3. Perform a slow boot.
4. Does the problem persist?  
**No:** This ends the procedure.  
**Yes:** Continue to the next step.

5. Replace the processor book (Un-Pm, where m = 2 - 9) the memory DIMM, processor, or GX adapter card plugged into.
6. Perform a slow boot. **This ends the procedure.**

## FSPSP28

The resource ID (RID) of the FRU could not be found in the vital product data (VPD) table.

1. Find another callout that reads "FSPxxxx" where xxxx is a 4 digit hex number that represents the RID. Record the RID and the model of the system.
2. Call next level of support to find out which FRU the RID represents.
3. Replace the FRU that the RID represents.
4. Perform a slow boot to ensure full hardware diagnostics. See Performing a slow boot. **This ends the procedure.**

## FSPSP29

The system has detected that all I/O bridges are missing from the system configuration.

Select the system that you are servicing and then perform the indicated FSPSP29 procedure.

8203-E4A, 9407-M15, and 9408-M25  
 8204-E8A and 9409-M50  
 8234-EMA, 9117-MMA, and 9406-MMA  
 9125-F2A  
 9119-FHA

### 8203-E4A, 9407-M15, 9408-M25, 8204-E8A and 9409-M50

1. Power off the system. To review the "Powering on and powering off" procedure go to Powering on and powering off the system .
2. Replace the system backplane (Un-P1). Refer to System FRU locations and locate the correct location of the part needing servicing on your system.
3. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot **This ends the procedure.**

### 8234-EMA, 9117-MMA, and 9406-MMA

1. Power off the system. To review the "Powering on and powering off" procedure go to Powering on and powering off the system .
2. Replace the Service Processor (Un-P1-C11).
3. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot
4. Does the problem persist?

**No:** Go to Verify a repair. **This ends the procedure.**

**Yes:** Continue with the next step.

5. Replace the system backplane (Un-P1).
6. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot
7. Does the problem persist?

**No:** Go to Verify a repair **This ends the procedure.**

**Yes:** Continue with the next step.

8. Replace each Secondary Unit System Backplane (Un-P1), one at a time, until the problem is resolved. **This ends the procedure.**

(9125-F2A) perform the following:

1. Power off the system. To review the "Powering on and powering off" procedure go Powering on and powering off the system .
2. Replace the I/O backplane (Un-P1).
3. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot

## 9119-FHA

FSPSP29 is not applicable to the 9119-FHA.

**This ends the procedure.**

## FSPSP30

A problem has been encountered accessing the VPD card or the data found on the VPD card has been corrupted.

This error occurred before VPD collection was completed. No location codes have been created.

1. Power off the system. To review the "Powering on and powering off" procedure go Powering on and powering off
2. Clear any deconfiguration errors for the VPD card.
3. Perform the action indicated in the table below for your system.

System:	Action:
8203-E4A, 9407-M15, and 9408-M25	Replace the VPD card (Un-P1-C11). Refer to System FRU locations to locate the correct system location of the part you are replacing. <b>This ends the procedure.</b>
8204-E8A and 9409-M50	Replace the VPD card (Un-P1-C9). Refer to System FRU locations to locate the correct system location of the part you are replacing. <b>This ends the procedure.</b>
8234-EMA, 9117-MMA, and 9406-MMA	<ol style="list-style-type: none"> <li>1. Replace all the service processors.</li> <li>2. Perform a slow boot.</li> <li>3. Does the problem persist?</li> </ol> <p><b>No:</b> Go to Verify a repair. <b>This ends the procedure.</b></p> <p><b>Yes:</b> Replace the VPD card and continue with the next step.</p>
9125-F2A	Replace the VPD card (Un-P1-C4). Refer to
9119-FHA	<ol style="list-style-type: none"> <li>1. Replace both of the CEC service processor cards.</li> <li>2. Perform a slow boot.</li> <li>3. Does the error reoccur?</li> </ol> <p><b>No:</b> This ends the procedure.</p> <p><b>Yes:</b> Replace the VPD card (Un-P1-C1) and continue with the next step.</p>

4. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.
- Does the problem persist?
- No:** This ends the procedure.
- Yes:** Continue with the next step.

5. Perform the action indicated in the table below for your system.

System:	Action:
8203-E4A, 9407-M15, and 9408-M25	Replace the system backplane (Un-P1).
8204-E8A and 9409-M50	Replace the system backplane (Un-P1).
8234-EMA, 9117-MMA, and 9406-MMA	Replace the system backplane.
9125-F2A	Replace the I/O Backplane (Un-P1).
9119-FHA	Replace the CEC midplane (Un-P1).

## FSPSP31

The service processor has detected that one or more of the required fields in the system VPD has not been initialized.

1. Log into ASMI with authorized service provider authority (see Accessing the Advanced System Management Interface).
2. Set the system VPD values (see Setting the system enclosure type and Setting the system identifiers).

**Note:** The service processor will automatically reset when leaving the ASMI after updating the system VPD.

3. Power on the system. See Powering on and powering off the system . **This ends the procedure.**

## FSPSP32

A problem with the enclosure has been found.

The problem is resulting from one of the following:

- The enclosure VPD cannot be found.
- The enclosure serial number is not programmed.
- The enclosure feature code is not programmed.

Refer to System FRU locations for instructions for removing and replacing any FRUs called out by the following procedure.

Perform the following:

1. Record the reason code (the last 4 characters of word 11) from the SRC by looking at the operator panel or accessing the error log with the ASMI.
2. Is the reason code A46F?  
**No:** Go to step 5 on page 239.  
**Yes:** Continue with the next step.
3. Check for and apply any server firmware updates. Does the problem persist?  
**No: This ends the procedure.**  
**Yes:** Continue with the next step.

4. Use the following table to determine the action to perform.

System	Action
8203-E4A, 9407-M15, 9408-M25, 8204-E8A and 9409-M50	Perform the following: <ol style="list-style-type: none"> <li>1. Power off the system. See Powering on and powering off the system .</li> <li>2. Replace the system backplane (Un-P1).</li> <li>3. Perform a slow boot. See Performing a slow boot.</li> </ol> Does the problem persist? <p><b>No:</b> This ends the procedure.</p> <p><b>Yes:</b> Contact your next level of support. This ends the procedure.</p>
8234-EMA, 9117-MMA, and 9406-MMA	Perform the following: <ol style="list-style-type: none"> <li>1. Power off the system. See Powering on and powering off the system .</li> <li>2. Replace the service processor.</li> <li>3. Perform a slow boot. See Performing a slow boot.</li> </ol> Does the problem persist? <p><b>No: This ends the procedure.</b></p> <p><b>Yes:</b> Continue with the next step.</p> <ol style="list-style-type: none"> <li>4. Power off the system (see “Powering on and powering off” on page 608).</li> <li>5. Replace the system backplane.</li> <li>6. Perform a slow boot.</li> </ol> Does the problem persist? <p><b>No:</b> This ends the procedure.</p> <p><b>Yes:</b> Contact your next level of support. <b>This ends the procedure.</b></p>
9125-F2A	Perform the following: <ol style="list-style-type: none"> <li>1. Power off the system. See Powering on and powering off the system .</li> <li>2. Replace the I/O Backplane (Un-P1).</li> <li>3. Perform a slow boot. See Performing a slow boot</li> </ol> Does the problem persist? <p><b>No:</b> This ends the procedure.</p> <p><b>Yes:</b> Contact your next level of support. <b>This ends the procedure.</b></p>

System	Action
IBM Power 595 (9119-FHA)	Perform the following: <ol style="list-style-type: none"> <li>1. Power off the system. See Powering on and powering off the system .</li> <li>2. Replace both CEC service processor cards.</li> <li>3. Perform a slow boot. See Performing a slow boot. Does the problem persist? <b>No:</b> This ends the procedure. <b>Yes:</b> Continue with the next step.</li> <li>4. Power off the system. See Powering on and powering off the system ..</li> <li>5. Replace the CEC Midplane (Un-P1).</li> <li>6. Perform a slow boot. See Performing a slow boot. Does the problem persist? <b>No:</b> This ends the procedure. <b>Yes:</b> Contact your next level of support. <b>This ends the procedure.</b></li> </ol>

5. Is the reason code A460?

**No:** Go to step 7.

**Yes:** Continue with the next step.

6. Perform the following:

- a. Set the enclosure serial number using the ASMI. See Setting the system identifyers.
- b. The service processor will automatically reset when leaving the ASMI after updating the serial number.
- c. Perform a slow boot. See Performing a slow boot.

Does the problem persist?

**No: This ends the procedure.**

**Yes:** Contact your next level of support. **This ends the procedure.**

7. Is the reason code A45F?

**No:** Contact your next level of support. **This ends the procedure.**

**Yes:** Continue with the next step.

8. Perform the following:

- a. Set the enclosure feature code using the ASMI. See Setting the system enclosure type. The service processor will automatically reset when leaving the ASMI after updating the serial number.
- b. Perform a slow boot. See Performing a slow boot.

Does the problem persist?

**No: This ends the procedure.**

**Yes:** Contact your next level of support. **This ends the procedure.**

## FSPSP33

A problem has been detected in the connection with the HMC.

1. Ensure that the cable connectors to the network from the HMC, managed system, managed system partitions, and other HMCs are securely connected. If the connections are not secure, plug the cables back into the proper locations and make sure that the connections are good.

2. Check to see if the HMC is working correctly or if the HMC was disconnected incorrectly from the managed system, managed system partitions, and other HMCs. If either has happened, reboot the HMC.
3. Verify that the network connection between the HMC, managed system, managed system partitions, and other HMCs is working properly.
4. If applicable, service the next FRU. See System FRU locations for instructions.
5. If the problem continues to persist, contact your next level of support. **This ends the procedure.**

## FSPSP34

The memory cards are plugged in an invalid configuration and cannot be used by the system.

Refer to System FRU locations for information on locating the FRUs called out by the following procedure.

1. Is the SRC B1xx C02A?

**Yes:** A memory module is missing from the system. The additional parts in the FRU callout list will include all memory modules in the group with the missing card. To correct the error, visually check the system to determine which of these missing is missing, and add the module. **This ends the procedure.**

**No:** Continue with the next step.

2. Is the SRC B1xx C029?

**Yes:** A memory module is a different type than the other memory modules in the same group. The additional parts in the FRU callout list will include all memory modules in the group that contain the error. To correct the error, exchange the memory modules of the incorrect type with those of the desired type. **This ends the procedure.**

**No:** Continue with the next step.

3. Is the SRC B1xx C02B?

**Yes:** A group of memory modules are missing and are required so that other memory modules on the board can be configured. The additional parts in the FRU callout list will include all missing memory modules in the group. To correct the error, add or remove these modules to the desired locations. **This ends the procedure.**

**No:** Continue with the next step.

4. Is the SRC B1xx C036?

**Yes:** A memory module is not supported by this system. The additional parts in the FRU callout list will include all memory modules in the group that contains the unsupported modules. To correct the error, remove these modules from the system or replace them with the correct type. **This ends the procedure.**

**No:** Return to Start of Call. **This ends the procedure.**

## FSPSP35

The system has detected a problem with a memory controller.

Perform the following to enable redundant utilization:

1. Power off the system. See Powering on and powering off the system .
2. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

## FSPSP36

One or both of the SMP cables connecting the system processor cards on this system are incorrectly plugged, broken, or not the correct type of cable for this system configuration.

Refer to System FRU locations for instructions for removing and replacing any FRUs called out by the following procedure.

Perform the following:

1. Re-plug the SMP cables (P2-Cx-T1 or P2-Cx-T2) that connect to the system processor cards.
2. Perform a slow boot. See Performing a slow boot.
3. Does the problem persist?
  - Yes:** Continue with the next step.
  - No: This ends the procedure.**
4. Replace the SMP cables.
5. Perform a slow boot. See Performing a slow boot.
6. Does the problem persist?
  - No: This ends the procedure.**
  - Yes:** Continue with the next step.
7. Perform the following for each system processor card:
  - a. Power off the system (see Powering on and powering off the system ).
  - b. Remove processor card one in the primary unit.
  - c. Perform a slow boot. See Performing a slow boot.
  - d. Does the problem persist?
    - Yes:** Reinstall the processor card you removed and then repeat this step removing each of the processor cards, one at a time, until all of the processor cards have been removed. Perform a slow boot after removing each card. If you have removed the last processor card and the problem persists, contact your next level of support.
    - No:** Replace the processor you just removed, it is the failing FRU. **This ends the procedure.**

## FSPSP38

The system has detected an error within the JTAG path.

Replace all FRUs explicitly called out, if any, in the service processor error log entry first before continuing in this procedure. Skip those FRUs that have already been replaced during this service call. If one or more of those FRUs fixes the problem, **this ends the procedure**.

**Note:** In the "Priority" field in the FRU list, "replace these as a group" may appear even though only one FRU is listed. If that is the case, "replace as a group" can be ignored.

Refer to System FRU locations for information on locating FRUs called out by this procedure.

If the FRU(s) that have been replaced so far have not corrected the problem, perform the following:

Select the system that you are servicing and then perform the indicated FSPSP29 procedure.

8203-E4A, 9407-M15, and 9408-M25  
8204-E8A and 9409-M50  
8234-EMA, 9117-MMA, and 9406-MMA  
9125-F2A  
9119-FHA

### 8203-E4A, 9407-M15, and 9408-M25

1. Was the FRU called out before this procedure a memory DIMM (Un-P1-C14 through Un-P1-C17 or Un-P1-C21 through Un-P1-C24) or a GX adapter card (Un-P1-C8 or Un-P1-C6)?

**No:** This ends the procedure

**Yes:** Continue with 2.

2. Replace the system backplane (Un-P1).
3. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.  
**This ends the procedure.**

#### 8204-E8A and 9409-M50

1. Was the FRU called out before this procedure a memory DIMM (Un-P1-C13-Cx or Un-P1-C14-Cx or Un-P1-C15-Cx or Un-P1-C16-Cx)?

**No:** Go to step 4.

**Yes:** Continue with the next step.

2. Perform the following:
  - a. Replace the processor card (Un-P1-C13 or Un-P1-C14 or Un-P1-C15 or Un-P1-C16) that the DIMM was plugged to.
  - b. Perform a slow boot. See Performing a slow boot.
  - c. Does the problem persist?

**No:** This ends the procedure

**Yes:** Continue with the next step.

3. Perform the following:
  - a. Replace the system backplane (Un-P1).
  - b. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot. **This ends the procedure.**
4. Was the FRU called out before this procedure a processor card (Un-P1-C13 or Un-P1-C14 or Un-P1-C15 or Un-P1-C16) or GX adapter card (Un-P1-C8 or Un-C1-C7)?

**No:** This ends the procedure.

**Yes:** Continue with the next step.

5. Perform the following:
  - a. Replace the system backplane (Un-P1).
  - b. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

#### 8234-EMA, 9117-MMA, and 9406-MMA

1. Has a Memory DIMM (Un-P2-C1-Cx or Un-P2-C2-Cx) been replaced?

**No:** Go to step 10.

**Yes:** A Memory DIMM attention line has an error. Continue to the next step.

2. Replace the service processor (Un-P1-C11) in the same drawer as the Memory DIMM.
3. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.
4. Does the problem persist?

**No:** This ends the procedure.

**Yes:** Continue to the next step.

5. Replace the processor card (Un-P2-C1 or Un-P2-C2) on which a DIMM has been replaced.
6. Perform a slow boot. See Performing a slow boot.
7. Does the problem persist?

**No:** This ends the procedure.

**Yes:** Continue with the next step.

8. Replace the system backplane (Un-P1) in the same drawer as the Memory DIMM.
9. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**
10. Has a processor card (Un-P2-C1 or Un-P2-C2) or GX adapter card (Un-P1-C8 or Un-P1-C9) been replaced?

**No:** Go to step 16

**Yes:** A processor card or GX adapter card attention line has an error. Continue to the next step.

11. Replace the service processor (Un-P1-C11) from the same drawer as the processor card or GX adapter card.
12. Perform a slow boot. See Performing a slow boot.
13. Does the problem persist?

**No:** **This ends the procedure.**

**Yes:** Continue with the next step.

14. Replace the system backplane (Un-P1) from the same drawer as the processor card or GX adapter card.
15. Perform a slow boot. **This ends the procedure.**
16. Was the system backplane (Un-P1) explicitly called out as a FRU before starting step 1 of this procedure?

**No:** Contact your next level of support. **This ends the procedure.**

**Yes:** A P5IOC2 attention line has an error. Continue to the next step.

17. Replace the service processor (Un-P1-C11) from the same drawer as the system backplane.
18. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

#### 9125-F2A

1. Was the FRU called out before this procedure a GX adapter card (Un-Pm-Cx, where m = 2 - 9 and x = 37 - 40)?

**No:** **This ends the procedure.**

**Yes:** Continue to the next step.

2. Replace both node FSP cards (Un-Pm-C41 and Un-Pm-C42, where m = 2 - 9) from the same Node as the GX adapter card.
3. Perform a slow boot. To review the "Performing a slow boot" procedure go to Performing a slow boot.
4. Does the problem persist?

**No:** **This ends the procedure.**

**Yes:** Continue to the next step.

5. Replace the processor book (Un-Pm, where m = 2 - 9) the GX adapter card plugged into.
6. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

#### 9119-FHA

This procedure is not applicable to the 9119-FHA

## FSPSP42

An error communicating between two system processors was detected.

Refer to System FRU locations for instructions on locating FRUs found on your system.

There is a communication error between the processors and the FRUs called out before this procedure. If you were unable to correct the problem by replacing FRUs that were previously specified before coming to this procedure, consider the possibility of failing system backplanes.

If you are servicing a 8234-EMA, 9117-MMA, and 9406-MMA, go to **8234-EMA, 9117-MMA, and 9406-MMA**

**All systems except 8234-EMA, 9117-MMA, and 9406-MMA**

Perform the following task:

1. Power off the system. See Powering on and powering off the system .
2. Replace the system backplane (Un-P1).
3. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

**8234-EMA, 9117-MMA, and 9406-MMA**

1. Use the location codes for the FRUs that were previously specified to determine if the system processors are on separate nodes. Are the system processors on separate nodes?

**No:** Continue with step 2.

**Yes:** Do the following:

- a. Power off the system. See Powering on and powering off the system .
- b. Replace the SMP cables between the two enclosures.
- c. Perform a slow boot. See Performing a slow boot.
- d. Is the problem resolved?

**Yes: This ends the procedure.**

**No:** Continue with the next step.

2. Power off the system. See Powering on and powering off the system
3. Replace the bad node backplane.
4. Perform a slow boot. See Performing a slow boot. This ends the procedure.

## **FSPSP45**

The system has detected an error with FSI path.

Select the system that you are servicing and then perform the FSPSP45 procedure.

8203-E4A, 9407-M15, and 9408-M25  
8204-E8A and 9409-M50  
8234-EMA, 9117-MMA, and 9406-MMA  
9125-F2A  
9119-FHA

**8203-E4A, 9407-M15, and 9408-M25**

Perform the following task:

1. Replace the system backplane (Un-P1) See System FRU locations for information on locating the FRU.
2. Perform a slow boot. Refer to Performing a slow boot.

**8204-E8A and 9409-M50**

Perform the following task:

1. Replace the processor cards one at a time (Un-P1-C13 or Un-P1-C14 or Un-P1-C15 or Un-P1-C16). See System FRU locations for information on locating the FRU.
2. Perform a slow boot. Refer to Performing a slow boot. Does the problem persist?
  - No:** This ends the procedure.
  - Yes:** Continue with the next step.
3. Have all processor cards been replaced?
  - No:** Go back to step 1 and replace a different processor card.
  - Yes:** Continue with the next step.
4. Replace the system backplane (Un-P1)
5. Perform a slow boot. Refer to Performing a slow boot. **This ends the procedure.**

#### 8234-EMA, 9117-MMA, and 9406-MMA

Perform the following task:

1. Replace the Flex System Cable (location P1-C11-T5) that connects the FRUs listed in the FRU list. See System FRU locations for information on locating the FRU.
2. Perform a slow boot. Refer to Performing a slow boot.

#### 9125-F2A

Perform the following task:

1. Was the FRU called out before this procedure a Memory DIMM (Un-P2-Cx, where x = 1 - 64) or GX Adapter card (Un-P2-C65 or Un-P2-C66)?
  - No:** Go to step 7.
  - Yes:** Continue to the next step.
2. Replace the I/O Backplane (Un-P1).
3. Perform a slow boot. Refer to Performing a slow boot.
4. Does the problem persist?
  - No:** This ends the procedure.
  - Yes:** Continue to the next step.
5. Replace the processor backplane (Un-P2).
6. Perform a slow boot. Performing a slow boot. **This ends the procedure.**
7. Was the FRU called out before this procedure a processor (Un-P2-Cx, where x = 67 - 82) or processor backplane (Un-P2)?
  - No:** This ends the procedure.
  - Yes:** Continue to the next step.
8. Replace the I/O backplane (Un-P1).
9. Perform a slow boot. See Performing a slow boot.

#### 9119-FHA

Perform the following task:

1. Was the FRU called out before this procedure a Memory DIMM (Un-Pm-Cx, where m = 2 - 9 and x = 1 - 36), a Processor (Un-Pm-Cx, where m = 2 - 9 and x = 25 - 28), or GX Adapter Card (Un-Pm-Cx, where m = 2 - 9 and x = 37 - 40)?
  - No:** This ends the procedure.

**Yes:** Continue to the next step.

2. Replace both Node FSP Cards (Un-Pm-C41 and Un-Pm-C42, where m = 2 - 9) from the same Node as the Memory DIMM, Processor, or GX Adapter Card.
3. Perform a slow boot. See Performing a slow boot.
4. Does the problem persist?

**No:** **This ends the procedure.**

**Yes:** Continue to the next step.

5. Replace the Processor Book (Un-Pm, where m = 2 - 9) the Memory DIMM, Processor, or GX Adapter Card plugged into.
6. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

## FSPSP46

Some corrupt areas of flash or RAM have been detected on the service processor.

1. Use the following table to determine the action to perform.

System	Action
8203-E4A, 9407-M15, 9408-M25, 8204-E8A, 9409-M50	Replace the system backplane (Un-P1). See System FRU locations for information on system FRU location.
8234-EMA, 9117-MMA, and 9406-MMA	Replace the Service Processor. <ol style="list-style-type: none"><li>1. If the last byte in word 3 of the SRC is a 10, replace the primary unit, service processor (Un-P1-C11).</li><li>2. If the last byte in word 3 of the SRC is a 20, replace the scndary unit 1, service processor (Un-P1-C11).</li></ol>
9125-F2A	Replace the I/O backplane (Un-P1).
9119-FHA	Replace the failing CEC service processor card.

2. Perform a slow boot. See Performing a slow boot.

**This ends the procedure.**

## FSPSP47

The system has detected an error within the PSI link. To resolve the problem, perform the following:

Refer to System FRU locations for instructions for removing and replacing any FRUs called out by the following procedure.

Select the system group that you are servicing:

- 8203-E4A, 9407-M15, and 9408-M25
- 8204-E8A and 9409-M50
- 9117-MMA and 9406-MMA
- 9125-F2A

### 8203-E4A, 9407-M15, and 9408-M25

Perform the following:

1. Replace the system backplane (Un-P1)
2. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

### 8204-E8A and 9409-M50

Perform the following:

1. Replace the processor cards one at a time (Un-P1-C13 or Un-P1-C14 or Un-P1-C15 or Un-P1-C16). See System FRU locations for instructions for removing and replacing any FRUs.
2. Perform a slow boot. Refer to Performing a slow boot.
3. Does the problem persist?  
**No:** This ends the procedure  
**Yes:** Continue with the next step.
4. Have all processor cards been replaced?  
**No:** Go back to step 1 and replace a different processor card.  
**Yes:** Continue with the next step.
5. Replace the system backplane (Un-P1)
6. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

#### 9117-MMA and 9406-MMA

Perform the following:

1. Replace the service processor.
2. Perform a slow boot. See Performing a slow boot.
3. Does the problem persist?  
**No:** This ends the procedure.  
**Yes:** Continue with the next step.
4. Replace the processor cards one at a time.
5. Perform a slow boot. See Performing a slow boot.
6. Does the problem persist?  
**No:** This ends the procedure.  
**Yes:** Continue with the next step.
7. Replace the system backplane.
8. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

#### 9125-F2A

Perform the following:

1. Replace the I/O Backplane (Un-P1).
2. Perform a slow boot. See Performing a slow boot.
3. Does the problem persist?  
**No:** This ends the procedure.  
**Yes:** Continue with the next step.
4. Replace the Processor Backplane (Un-P2).
5. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

## FSPSP48

A diagnostic function detects an external processor interface problem. If replacing the FRUs previously listed in the FRU list does not fix the problem, perform the following:

Select the system that you are servicing and then perform the indicated FSPSP29 procedure.

8203-E4A, 9407-M15, and 9408-M25  
8204-E8A and 9409-M50  
8234-EMA, 9117-MMA, and 9406-MMA  
9125-F2A  
9119-FHA

#### 8203-E4A, 9407-M15, 9408-M25, 8204-E8A, and 9409-M50

Perform the following task:

1. Power off the system. See Powering on and powering off the system .
2. Replace the system backplane (Un-P1). See System FRU locations for information on FRU location for the system you are servicing.
3. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

#### 8234-EMA, 9117-MMA, and 9406-MMA

Perform the following task:

1. Power off the system. See Powering on and powering off the system .
2. Replace the SMP cable (P2-Cx-T1 or P2-Cx-T2) that attaches the two nodes that were called out before this procedure. See System FRU locations for information on FRU locations for the system that you are servicing.
3. Perform a slow boot. See Performing a slow boot.

#### 9125-F2A

Replace the regulator distribution backplane (Un-P2). Refer to System FRU locations for information on locating the regulator distribution backplane.

#### 9119-FHA

Perform the following task:

1. Power off the system. See Powering on and powering off the system .
2. Replace the processor book (Un-Pm, where m = 2 - 9) of each failing FRU.
3. Perform a slow boot. See Performing a slow boot
4. Does the problem still exist?  
**Yes:** Continue to the next step.  
**No:** **This ends the procedure.**
5. Replace the CEC midplane (Un-P1).
6. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

## FSPSP49

A diagnostic function detects an internal processor interface problem. If replacing the FRUs previously listed in the FRU list does not fix the problem, perform the following:

1. Power off the system. See Powering on and powering off the system .
2. Use the following table to determine the action to perform.

System:	Action:
8203-E4A, 9407-M15, and 9408-M25	Replace the system backplane (Un-P1). Refer to System FRU locations for information on locating the system backplane.

System:	Action:
8204-E8A and 9409-M50	Replace the system backplane (Un-P1). Refer to System FRU locations for information on locating the system backplane.
8234-EMA, 9117-MMA, and 9406-MMA	Replace the regulator distribution backplane (Un-P2). Refer to System FRU locations for information on locating the regulator distribution backplane.
9125-F2A	Replace the regulator distribution backplane (Un-P2). Refer to System FRU locations for information on locating the regulator distribution backplane.
9119-FHA	Replace the processor book (Un-Pm, where m = 2-9) for the failing FRU.

3. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

## FSPSP50

A diagnostic function detects a connection problem between a processor chip and a GX chip. If replacing the FRUs previously listed in the FRU list does not fix the problem, perform the following:

1. Power off the system. See Powering on and powering off the system .
2. Use the following table to determine the action to perform.

System:	Action:
8203-E4A, 9407-M15, and 9408-M25	Replace the system backplane (Un-P1). Refer to System FRU locations for information on locating the system backplane.
8204-E8A and 9409-M50	Replace the system backplane (Un-P1). Refer to System FRU locations for information on locating the system backplane.
8234-EMA, 9117-MMA, and 9406-MMA	Replace the mid-plane backplane (Un-P1). Refer to System FRU locations for information on locating the regulator distribution backplane.
9125-F2A	Replace the mid-plane backplane (Un-P1). Refer to System FRU locations for information on locating the regulator distribution backplane.
9119-FHA	Replace the processor book (Un-Pm, where m = 2-9) for the failing FRU.

3. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

## FSPSP51

Runtime diagnostics detected a memory bus correctable error that is exceeding the threshold. The memory bus correctable error will not cause an immediate loss of system operations. However, the system is operating in a degraded mode.

To resolve the problem, replace the FRU called out after this procedure. Refer to System FRU locations for instructions.

## FSPSP52

A problem has been detected on a memory bus. If replacing the FRUs previously listed in the FRU list does not fix the problem, perform the following:

1. Power off the system. See Powering on and powering off the system ).
2. Use the following table to determine the action to perform.

System	Action
8203-E4A, 9407-M15, and 9408-M25	Replace the system backplane (Un-P1). Refer to System FRU locations for information on system FRU location.

System	Action
8204-E8A and 9409-M50	Replace the processor card the DIMMs were located on (Un-P1-C13 or Un-P1-C14 or Un-P1-C15 or Un-P1-C16). Refer to System FRU locations for information on system FRU location.
8234-EMA, 9117-MMA, and 9406-MMA	Replace the Processor Card on which DIMMs were previously replaced. Refer to System FRU locations for information on system FRU location.

3. Perform a slow boot. See Performing a slow boot.

**This ends the procedure.**

## FSPSP54

A processor over-temperature has been detected. Check for any environmental issues before replacing any parts.

- Is the ambient room temperature in the normal operating range (less than 35 degrees C/95 degrees F)?
  - No:** Notify the customer. The customer must lower the room temperature so that it is within the normal range. Do not replace any parts. **This ends the procedure.**
  - Yes:** Continue to the next step.
- Are the front and rear of the CEC drawer, and the front and rear rack doors, free of obstructions that would impede the airflow through the drawer?
  - No:** Notify the customer. The system must be free of obstructions for proper airflow. Clean the air inlets and exits in the drawer as required. Do not replace any parts. **This ends the procedure.**
  - Yes:** Continue to the next step.
- Are all of the fans, especially those at the back of the power supply, functioning normally?
  - No:** Replace any fans that are not turning or are turning slowly. Refer to System FRU locations for instructions. **This ends the procedure.**
  - Yes:** There are no environmental issues with the cooling of the processors. **This ends the procedure.**

## FSPSP55

An error has been detected on a bus between two FRUs. The endpoint FRUs have been called out. However, the source of the error could be the bus path between the FRUs.

Refer to System FRU locations for information on FRU and removal when performing FSPSP55.

Select the system that you are servicing and then perform the indicated FSPSP55 procedure.

8203-E4A, 9407-M15, and 9408-M25  
 8204-E8A and 9409-M50  
 8234-EMA, 9117-MMA, and 9406-MMA  
 9125-F2A  
 9119-FHA

**8203-E4A, 9407-M15, 9408-M25, 8204-E8A, and 9409-M50**

Perform the following task:

- Is word 6 (the 8 leftmost characters of panel function 13) of the reference code 00000001?

**No:** Go to the next step.

**Yes:** Perform the following:

- a. The XYZ bus has an error. Replace the FRUs called out after this procedure.
- b. Did replacing the FRUs correct the problem?

**No:** Perform the following:

- 1) Replace the system backplane (Un-P1).
- 2) Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

**Yes:** **This ends the procedure.**

2. Is word 6 of the reference code 00000002?

**No:** Go to the next step.

**Yes:** The AB bus has an error. Replace the FRUs called out after this procedure.

3. Did replacing the FRUs correct the problem?

**No:** Perform the following:

- a. Replace the system backplane (Un-P1).
- b. Perform a slow boot. See Performing a slow boot.

**Yes:** **This ends the procedure.**

4. Is word 6 of the reference code 00000004 or 00000005?

**No:** Go to the next step.

**Yes:** The processor - GX card bus or PSI bus has an error. Replace the FRUs called out after this procedure.

5. Did replacing the FRUs correct the problem?

**No:** Perform the following:

- a. Replace the system backplane (Un-P1).
- b. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

**Yes:** **This ends the procedure.**

6. For any other value in word 6 of the reference code, the bus error is corrected by the FRUs called out after this procedure. Replace the FRUs called out after this procedure. **This ends the procedure.**

#### 8234-EMA, 9117-MMA, and 9406-MMA

Perform the following task:

1. Is word 6 (the 8 leftmost characters of panel function 13) of the reference code 00000001 or 00000008?

**No:** Go to the next step.

**Yes:** Perform the following:

- a. The XYZ bus or the Processor - P5IOC2 bus has an error. Replace the FRUs called out after this procedure.
- b. Did replacing the FRUs correct the problem?

**Yes:** **This ends the procedure.**

**No:** Perform the following:

- 1) Replace the Regulator Distribution Backplane (Un-P2) from the drawer the FRUs were replaced.
- 2) Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

2. Is word 6 of the reference code 00000002?

**No:** Go to the next step.

**Yes:** Perform the following:

- a. The AB bus has an error. Replace the SMP Cable (Un-P2-Cx-Tx is the connector ) between the FRUs called out after this procedure.
- b. Clear the deconfiguration errors for the FRUs called out.
- c. Perform a slow boot. See Performing a slow boot.
- d. Did replacing the SMP Cable correct the problem?

**No:** Replace the FRUs called out after this procedure. **This ends the procedure.**

**Yes:** **This ends the procedure.**

3. Is word 6 of the reference code 00000004 or 00000005?

**No:** Go to the next step.

**Yes:** Perform the following:

- a. The processor - GX card bus or PSI bus has an error. Replace the FRUs called out after this procedure.
- b. Did replacing the FRUs correct the problem?

**Yes:** **This ends the procedure.**

**No:** Perform the following:

- 1) Replace the Regulator Distribution Backplane (Un-P2) from the drawer where the FRUs were replaced.
- 2) Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

- c. Does the problem persist?

**No:** **This ends the procedure.**

**Yes:** Perform the following:

- 1) Replace the System Backplane (Un-P1) from the drawer where the FRUs were replaced.
- 2) Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

4. Is word 6 of the reference code 00000006?

**No:** Go to the next step.

**Yes:** The DIMM - DIMM bus has an error. Replace the FRUs called out after this procedure.

- a.
- b.

5. Did replacing the FRUs correct the problem?

**No:** Perform the following:

- a. Replace the Processor Card (Un-P2-C1 or Un-P2-C2) from the drawer where the FRUs were replaced.
- b. Perform a slow boot. See Performing a slow boot. **This ends the procedure.**

**Yes:** **This ends the procedure.**

6. For any other value in word 6 of the reference code, the bus error is corrected by the FRUs called out after this procedure. Replace the FRUs called out after this procedure. **This ends the procedure.**

#### 9125-F2A

1. Is word 6 of the reference code 00000004?

**No:** Go to the next step.

- Yes:** The Processor-GX card bus has an error. Replace the FRUs called out after this procedure.
2. Did replacing the FRUs correct the problem?
- No:** Perform the following:
- Replace the I/O Backplane (Un-P1)
  - Perform a slow boot.
- Yes:** **This ends the procedure.**
3. Does the problem persist?
- No:** **This ends the procedure.**
- Yes:** For any other value in word 6 of the reference code, the bus error is corrected by the FRUs called out after this procedure. Replace the FRUs called out after this procedure. **This ends the procedure.**

#### 9119-FHA

1. Is word 6 of the reference code 00000005 or 00000002?
- No:** Go to step 3.
- Yes:** The Processor AB or PSI card bus has an error. Replace the FRUs called out after this procedure.
2. Did replacing the FRUs correct the problem?
- No:** Perform the following:
- Replace the system backplane (Un-P1).
  - Perform a slow boot. **This ends the procedure.**
- Yes:** This ends the procedure.
3. Is word 6 of the reference code 00000006?
- No:** Go to step 4.
- Yes:** Perform the following:
- The DIMM - DIMM bus has an error. Replace the FRUs called out after this procedure.
  -
4. Did replacing the FRUs correct the problem?
- No:** Perform the following:
- Replace the Processor Book (Un-P2 thru P9) that the FRUs called out were replaced on.
  - Perform a slow boot. **This ends the procedure.**
- Yes:** This ends the procedure.
5. For any other value in word 6 of the reference code, the bus error is corrected by the FRUs called out after this procedure. Replace the FRUs called out after this procedure. **This ends the procedure.**

#### FSPSP57

The host appears on only one Bulk Power network hub.

Perform the following:

- If you are servicing a 9119-FHA, use the “9119-FHA bulk power connection tables” on page 255 to verify the cables for the missing host are connected properly. The missing host is identified by using words 6 and 7 of the SRC. If the missing host is a node controller, the node controller is identified using word 7 and word 8 of the SRC.

If you are servicing a 9125-F2A, use the “9125–F2A bulk power connection tables” on page 256 to verify the cables for the missing host are connected properly. The missing host is identified using words 6 and 7 of the SRC.

- Word 6 indicates which Bulk Power Hub the host is missing from.
  - If word 6 is 0x0000000A, then the host is missing from Bulk Power Hub A (Un-P1-C4).
  - If word 6 is 0x0000000B, then the host is missing from Bulk Power Hub B (Un-P2-C4).
- Word 7 indicates the missing host. Use the following tables to identify the missing host based upon the value of word 7.

Table 54. 9119-FHA word 7 value to missing host cross reference

Word 7 value	Missing host
0x00000095	System controller A
0x00000094	System controller B
0x00000093	Bulk Power Controller B
0x00000092	Bulk Power Controller A
0x000000xx ( xx = 2 through 9)	Node Controller in node Um-Px (x = 2 through 9)
<b>Note:</b> If word 7 indicates the missing host is a node controller (0x000000xx, where xx = 2 through 9), word 8 indicates the connector on the bulk power hub that is reporting the missing node controller connection. See Table 56 for information on word 8 bulk power hub connector cross references.	

Table 55. 9125-F2A word 7 value to missing host cross reference

Word 7 value	Missing host
0x00000093	Bulk Power Controller B
0x00000092	Bulk Power Controller A
0x000000xx ( xx = 01 through 16)	IH CEC Node 1 through 16
<b>Note:</b> Use the value of word 7 and the “9125–F2A bulk power connection tables” on page 256 to determine which node controller is not connected to the bulk power hub.	

Table 56. 9119-FHA word 8 to bulk power hub connector number cross reference

Word 8 value	Bulk power hub connector number	Word 8 value	Bulk power hub connector number	Word 8 value	Bulk power hub connector number
0x00000001	J01	0x00000009	J09	0x00000011	J17
0x00000002	J02	0x0000000A	J10	0x00000012	J18
0x00000003	J03	0x0000000B	J11	0x00000013	J19
0x00000004	J04	0x0000000C	J12	0x00000014	J20
0x00000005	J05	0x0000000D	J13	0x00000015	J21
0x00000006	J06	0x0000000E	J14	0x00000016	J22
0x00000007	J07	0x0000000F	J15	0x00000017	J23
0x00000008	J08	0x00000010	J16	0x00000018	J24
<b>Note:</b> Use the value of word 8 and the “9119–FHA bulk power connection tables” on page 255 to determine which node controller is not connected to the bulk power hub.					

2. Are all cables connected correctly?

**Yes:** Continue to step 4.

**No:** Correct the cable connections.

3. Does the problem persist?

- Yes:** Continue to the next step.
- No:** **This ends the procedure.**
4. Replace the cable used to connect the missing host to the Bulk Power Hub.
  5. Does the problem persist?
 

**Yes:** Continue to the next step.

**No:** **This ends the procedure.**
  6. Replace the missing host identified in word 7 of the SRC, or if servicing a 9119-FHA the missing node controller identified by word 7 and word 8.
  7. Does the problem persist?
 

**Yes:** Continue to the next step.

**No:** **This ends the procedure.**
  8. Replace the Bulk Power Hub (Un-P1-C4 or Un-P2-C4) identified in word 6 of the SRC. **This ends the procedure.**

### 9119–FHA bulk power connection tables

Contains four cross reference tables that identifies the CEC node to bulk power hub, system controller to bulk power hub, bulk power controller to bulk power hub, and Hardware Management Console (HMC) bulk power hub connections.

Table 57. Node controller to bulk power hub connection table

CEC Node Location	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
<i>Un</i> refers to BPC location. <i>Um</i> refers to CEC location.				
P2	<i>Um</i> -P2-C41	<i>Um</i> -P2-C41-J01	<i>Un</i> -P1-C4-J18	
		<i>Um</i> -P2-C41-J02		<i>Un</i> -P2-C4-J18
	<i>Um</i> -P2-C42	<i>Um</i> -P2-C42-J01	<i>Un</i> -P1-C4-J17	
		<i>Um</i> -P2-C42-J02		<i>Un</i> -P2-C4-J17
P3	<i>Um</i> -P3-C41	<i>Um</i> -P3-C41-J01	<i>Un</i> -P1-C4-J12	
		<i>Um</i> -P3-C41-J02		<i>Un</i> -P2-C4-J12
	<i>Um</i> -P3-C42	<i>Um</i> -P3-C42-J01	<i>Un</i> -P1-C4-J11	
		<i>Um</i> -P3-C42-J02		<i>Un</i> -P2-C4-J11
P4	<i>Um</i> -P4-C41	<i>Um</i> -P4-C41-J01	<i>Un</i> -P1-C4-J10	
		<i>Um</i> -P4-C41-J02		<i>Un</i> -P2-C4-J10
	<i>Um</i> -P4-C42	<i>Um</i> -P4-C42-J01	<i>Un</i> -P1-C4-J09	
		<i>Um</i> -P4-C42-J02		<i>Un</i> -P2-C4-J09
P5	<i>Um</i> -P5-C41	<i>Um</i> -P5-C41-J01	<i>Un</i> -P1-C4-J22	
		<i>Um</i> -P5-C41-J02		<i>Un</i> -P2-C4-J22
	<i>Um</i> -P5-C42	<i>Um</i> -P5-C42-J01	<i>Un</i> -P1-C4-J21	
		<i>Um</i> -P5-C42-J02		<i>Un</i> -P2-C4-J21
P6	<i>Um</i> -P6-C41	<i>Um</i> -P6-C41-J01	<i>Un</i> -P1-C4-J20	
		<i>Um</i> -P6-C41-J02		<i>Un</i> -P2-C4-J20
	<i>Um</i> -P6-C42	<i>Um</i> -P6-C42-J01	<i>Un</i> -P1-C4-J19	
		<i>Um</i> -P6-C42-J02		<i>Un</i> -P2-C4-J19

Table 57. Node controller to bulk power hub connection table (continued)

CEC Node Location	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
P7	Um-P7-C41	Um-P7-C41-J01	Un-P1-C4-J16	
		Um-P7-C41-J02		Un-P2-C4-J16
	Um-P7-C42	Um-P7-C42-J01	Un-P1-C4-J15	
		Um-P7-C42-J02		Un-P2-C4-J15
P8	Um-P8-C41	Um-P8-C41-J01	Un-P1-C4-J14	
		Um-P8-C41-J02		Un-P2-C4-J14
	Um-P8-C42	Um-P8-C42-J01	Un-P1-C4-J13	
		Um-P8-C42-J02		Un-P2-C4-J13
P9	Um-P9-C41	Um-P9-C41-J01	Un-P1-C4-J24	
		Um-P9-C41-J02		Un-P2-C4-J24
	Um-P9-C42	Um-P9-C42-J01	Un-P1-C4-J23	
		Um-P9-C42-J02		Un-P2-C4-J23

Table 58. System controller to bulk power hub connection table

System controller (SC)	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
SC-A	Um-P1-C2	Um-P1-C2-J04	Un-P1-C4-J05	
		Um-P1-C2-J03		Un-P2-C4-J05
SC-B	Um-P1-C5	Um-P1-C5-J04	Un-P1-C4-J06	
		Um-P1-C5-J03		Un-P2-C4-J06

Table 59. Bulk power controller to bulk power hub connection table

Bulk Power Controller (BPC)	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
BPC-A	Un-P1-C1	Un-P1-C2-J02	Un-P1-C4-J07	
		Un-P1-C2-J03		Un-P2-C4-J07
BPC-B	Un-P2-C1	Un-P1-C5-J02	Un-P1-C4-J08	
		Un-P1-C5-J03		Un-P2-C4-J08

Table 60. Hardware management console (HMC) bulk power hub connection table

HMC	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
HMC-A	Un-P1-C4-J01	
HMC-B		Un-P2-C4-J01

## 9125–F2A bulk power connection tables

Contains two cross reference tables that identifies the CEC node to bulk power hub and the bulk power controller to bulk power hub connections.

Table 61. CEC node to bulk power hub connection table

CEC Node Location	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
$U_n$ refers to BPC location. 01-17 refers to CEC node frame location.				
(01)	U01-P1	U01-P1-T10	$U_n$ -P1-C4-J24	
		U01-P1-T11		$U_n$ -P2-C4-J24
(02)	U03-P1	U03-P1-T10	$U_n$ -P1-C4-J23	
		U03-P1-T11		$U_n$ -P2-C4-J23
(03)	U05-P1	U05-P1-T10	$U_n$ -P1-C4-J22	
		U05-P1-T11		$U_n$ -P2-C4-J22
(04)	U07-P1	U07-P1-T10	$U_n$ -P1-C4-J21	
		U07-P1-T11		$U_n$ -P2-C4-J21
(05)	U09-P1	U09-P1-T10	$U_n$ -P1-C4-J20	
		U09-P1-T11		$U_n$ -P2-C4-J20
(06)	U11-P1	U11-P1-T10	$U_n$ -P1-C4-J19	
		U11-P1-T11		$U_n$ -P2-C4-J19
(07)	U13-P1	U13-P1-T10	$U_n$ -P1-C4-J18	
		U13-P1-T11		$U_n$ -P2-C4-J18
(08)	U15-P1	U15-P1-T10	$U_n$ -P1-C4-J17	
		U15-P1-T11		$U_n$ -P2-C4-J17
(09)	U17-P1	U17-P1-T10	$U_n$ -P1-C4-J16	
		U17-P1-T11		$U_n$ -P2-C4-J16
(10)	U19-P1	U19-P1-T10	$U_n$ -P1-C4-J15	
		U19-P1-T11		$U_n$ -P2-C4-J15
(11)	U21-P1	U21-P1-T10	$U_n$ -P1-C4-J14	
		U21-P1-T11		$U_n$ -P2-C4-J14
(12)	U23-P1	U23-P1-T10	$U_n$ -P1-C4-J13	
		U23-P1-T11		$U_n$ -P2-C4-J13
(13)	U25-P1	U25-P1-T10	$U_n$ -P1-C4-J12	
		U25-P1-T11		$U_n$ -P2-C4-J12
(14)	U27-P1	U27-P1-T10	$U_n$ -P1-C4-J11	
		U27-P1-T11		$U_n$ -P2-C4-J11
(15)	U29-P1	U29-P1-T10	$U_n$ -P1-C4-J10	
		U29-P1-T11		$U_n$ -P2-C4-J10
(16)	U31-P1	U31-P1-T10	$U_n$ -P1-C4-J09	
		U31-P1-T11		$U_n$ -P2-C4-J09

Table 62. Bulk power controller to bulk power hub connection table

Bulk Power Controller (BPC)	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
-----------------------------	--------------	------------------------	--	--

Table 62. Bulk power controller to bulk power hub connection table (continued)

BPC-A	Un-P1-C1	Un-P1-C2-J02	Un-P1-C4-J07	
		Un-P1-C2-J03		Un-P2-C4-J07
BPC-B	Un-P2-C1	Un-P1-C5-J02	Un-P1-C4-J08	
		Un-P1-C5-J03		Un-P2-C4-J08

## FSPSP58

A network cable is misplugged.

The FRU callout immediately following this procedure shows the current bulk power hub port that has the wrong cable plugged into it. The FRU callout after that shows the Bulk Power Hub Port that the cable should be plugged into. Move the cable to the correct port. **This ends the procedure.**

## FSPSP59

The network data is not available or missing.

### 1. Is the power on for the Bulk Power Controllers (Un-P1-C1 and Un-P2-C1)?

**No:** Apply power to the Bulk Power Controllers. Continue to the next step.

**Yes:** Replace the Bulk Power Controller called out after this procedure.

### 2. Does the problem persist?

**No:** This ends the procedure.

**Yes:** Replace the Bulk Power Hub called out after this procedure.

## FSPSP60

A MAC address has been duplicated in the system.

### 1. Perform LICCODE to update the System firmware.

**Note:** Do not update the BPC firmware.

### 2. Does the problem persist?

**No:** This ends the procedure.

**Yes:** Replace the hardware connected to the called out Bulk Power Hub Ports that follow this procedure. This ends the procedure.

## FSPSP61

An invalid network connection to the Bulk Power Hub has been detected causing a looping ping condition.

### 1. The callout following this procedure indicates which bulk power hub port to correct.

### 2. If you are servicing a 9119-FHA go to "9119-FHA bulk power connection tables." If you are servicing a 9125-F2A go to "9125-F2A bulk power connection tables" on page 260 to view the correct cabling connection.

## 9119-FHA bulk power connection tables

Contains four cross reference tables that identifies the CEC node to bulk power hub, system controller to bulk power hub, bulk power controller to bulk power hub, and Hardware Management Console (HMC) bulk power hub connections.

Table 63. Node controller to bulk power hub connection table

CEC Node Location	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
<i>Un</i> refers to BPC location. <i>Um</i> refers to CEC location.				
P2	<i>Um</i> -P2-C41	<i>Um</i> -P2-C41-J01	<i>Un</i> -P1-C4-J18	
		<i>Um</i> -P2-C41-J02		<i>Un</i> -P2-C4-J18
	<i>Um</i> -P2-C42	<i>Um</i> -P2-C42-J01	<i>Un</i> -P1-C4-J17	
		<i>Um</i> -P2-C42-J02		<i>Un</i> -P2-C4-J17
P3	<i>Um</i> -P3-C41	<i>Um</i> -P3-C41-J01	<i>Un</i> -P1-C4-J12	
		<i>Um</i> -P3-C41-J02		<i>Un</i> -P2-C4-J12
	<i>Um</i> -P3-C42	<i>Um</i> -P3-C42-J01	<i>Un</i> -P1-C4-J11	
		<i>Um</i> -P3-C42-J02		<i>Un</i> -P2-C4-J11
P4	<i>Um</i> -P4-C41	<i>Um</i> -P4-C41-J01	<i>Un</i> -P1-C4-J10	
		<i>Um</i> -P4-C41-J02		<i>Un</i> -P2-C4-J10
	<i>Um</i> -P4-C42	<i>Um</i> -P4-C42-J01	<i>Un</i> -P1-C4-J09	
		<i>Um</i> -P4-C42-J02		<i>Un</i> -P2-C4-J09
P5	<i>Um</i> -P5-C41	<i>Um</i> -P5-C41-J01	<i>Un</i> -P1-C4-J22	
		<i>Um</i> -P5-C41-J02		<i>Un</i> -P1-C4-J22
	<i>Um</i> -P5-C42	<i>Um</i> -P5-C42-J01	<i>Un</i> -P1-C4-J21	
		<i>Um</i> -P5-C42-J02		<i>Un</i> -P2-C4-J21
P6	<i>Um</i> -P6-C41	<i>Um</i> -P6-C41-J01	<i>Un</i> -P1-C4-J20	
		<i>Um</i> -P6-C41-J02		<i>Un</i> -P1-C4-J20
	<i>Um</i> -P6-C42	<i>Um</i> -P6-C42-J01	<i>Un</i> -P1-C4-J19	
		<i>Um</i> -P6-C42-J02		<i>Un</i> -P2-C4-J19
P7	<i>Um</i> -P7-C41	<i>Um</i> -P7-C41-J01	<i>Un</i> -P1-C4-J16	
		<i>Um</i> -P7-C41-J02		<i>Un</i> -P2-C4-J16
	<i>Um</i> -P7-C42	<i>Um</i> -P7-C42-J01	<i>Un</i> -P1-C4-J15	
		<i>Um</i> -P7-C42-J02		<i>Un</i> -P2-C4-J15
P8	<i>Um</i> -P8-C41	<i>Um</i> -P8-C41-J01	<i>Un</i> -P1-C4-J14	
		<i>Um</i> -P8-C41-J02		<i>Un</i> -P2-C4-J14
	<i>Um</i> -P8-C42	<i>Um</i> -P8-C42-J01	<i>Un</i> -P1-C4-J13	
		<i>Um</i> -P8-C42-J02		<i>Un</i> -P2-C4-J13
P9	<i>Um</i> -P9-C41	<i>Um</i> -P9-C41-J01	<i>Un</i> -P1-C4-J24	
		<i>Um</i> -P9-C41-J02		<i>Un</i> -P2-C4-J24
	<i>Um</i> -P9-C42	<i>Um</i> -P9-C42-J01	<i>Un</i> -P1-C4-J23	
		<i>Um</i> -P9-C42-J02		<i>Un</i> -P2-C4-J23

Table 64. System controller to bulk power hub connection table

System controller (SC)	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
------------------------	--------------	------------------------	--	--

Table 64. System controller to bulk power hub connection table (continued)

SC-A	U <sub>m</sub> -P1-C2	U <sub>m</sub> -P1-C2-J04	U <sub>n</sub> -P1-C4-J05	
		U <sub>m</sub> -P1-C2-J03		U <sub>n</sub> -P2-C4-J05
SC-B	U <sub>m</sub> -P1-C5	U <sub>m</sub> -P1-C5-J04	U <sub>n</sub> -P1-C4-J06	
		U <sub>m</sub> -P1-C5-J03		U <sub>n</sub> -P2-C4-J06

Table 65. Bulk power controller to bulk power hub connection table

Bulk Power Controller (BPC)	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
BPC-A	U <sub>n</sub> -P1-C1	U <sub>n</sub> -P1-C2-J02	U <sub>n</sub> -P1-C4-J07	
		U <sub>n</sub> -P1-C2-J03		U <sub>n</sub> -P2-C4-J07
BPC-B	U <sub>n</sub> -P2-C1	U <sub>n</sub> -P1-C5-J02	U <sub>n</sub> -P1-C4-J08	
		U <sub>n</sub> -P1-C5-J03		U <sub>n</sub> -P2-C4-J08

Table 66. Hardware management console (HMC) bulk power hub connection table

HMC	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
HMC-A	U <sub>n</sub> -P1-C4-J01	
HMC-B		U <sub>n</sub> -P2-C4-J01

## 9125–F2A bulk power connection tables

Contains two cross reference tables that identifies the CEC node to bulk power hub and the bulk power controller to bulk power hub connections.

Table 67. CEC node to bulk power hub connection table

CEC Node Location	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
U <sub>n</sub> refers to BPC location. 01–17 refers to CEC node frame location.				
(01)	U01-P1	U01-P1-T10	U <sub>n</sub> -P1-C4-J24	
		U01-P1-T11		U <sub>n</sub> -P2-C4-J24
(02)	U03-P1	U03-P1-T10	U <sub>n</sub> -P1-C4-J23	
		U03-P1-T11		U <sub>n</sub> -P2-C4-J23
(03)	U05-P1	U05-P1-T10	U <sub>n</sub> -P1-C4-J22	
		U05-P1-T11		U <sub>n</sub> -P2-C4-J22
(04)	U07-P1	U07-P1-T10	U <sub>n</sub> -P1-C4-J21	
		U07-P1-T11		U <sub>n</sub> -P2-C4-J21
(05)	U09-P1	U09-P1-T10	U <sub>n</sub> -P1-C4-J20	
		U09-P1-T11		U <sub>n</sub> -P2-C4-J20
(06)	U11-P1	U11-P1-T10	U <sub>n</sub> -P1-C4-J19	
		U11-P1-T11		U <sub>n</sub> -P2-C4-J19
(07)	U13-P1	U13-P1-T10	U <sub>n</sub> -P1-C4-J18	
		U13-P1-T11		U <sub>n</sub> -P2-C4-J18

Table 67. CEC node to bulk power hub connection table (continued)

CEC Node Location	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
(08)	U15-P1	U15-P1-T10	Un-P1-C4-J17	
		U15-P1-T11		Un-P2-C4-J17
(09)	U17-P1	U17-P1-T10	Un-P1-C4-J16	
		U17-P1-T11		Un-P2-C4-J16
(10)	U19-P1	U19-P1-T10	Un-P1-C4-J15	
		U19-P1-T11		Un-P2-C4-J15
(11)	U21-P1	U21-P1-T10	Un-P1-C4-J14	
		U21-P1-T11		Un-P2-C4-J14
(12)	U23-P1	U23-P1-T10	Un-P1-C4-J13	
		U23-P1-T11		Un-P2-C4-J13
(13)	U25-P1	U25-P1-T10	Un-P1-C4-J12	
		U25-P1-T11		Un-P2-C4-J12
(14)	U27-P1	U27-P1-T10	Un-P1-C4-J11	
		U27-P1-T11		Un-P2-C4-J11
(15)	U29-P1	U29-P1-T10	Un-P1-C4-J10	
		U29-P1-T11		Un-P2-C4-J10
(16)	U31-P1	U31-P1-T10	Un-P1-C4-J09	
		U31-P1-T11		Un-P2-C4-J09

Table 68. Bulk power controller to bulk power hub connection table

Bulk Power Controller (BPC)	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
BPC-A	Un-P1-C1	Un-P1-C2-J02	Un-P1-C4-J07	
		Un-P1-C2-J03		Un-P2-C4-J07
BPC-B	Un-P2-C1	Un-P1-C5-J02	Un-P1-C4-J08	
		Un-P1-C5-J03		Un-P2-C4-J08

## FSPSP62

The Service Processor has detected a missing node due to a mismatch between the nodes with power and what nodes the Service Processor can communicate with.

- Using the “9119–FHA bulk power connection tables” on page 262 or “9125–F2A bulk power connection tables” on page 263, verify the cables for the missing node. Word 6 of the SRC identifies the missing node as follows:

Table 69.

Word 6 value	Missing node
0x0000000x ( x = 2 through 9)	Node Controllers Un-Px (x = 2 through 9)

- Are the cables set correctly?

**Yes:** Continue to step 4 on page 262.

- No:** Correct the cable connections. Perform a slow boot.
3. Does the problem persist?
- Yes:** Continue to the next step.
- No:** **This ends the procedure.**
4. Replace the cables used to connect the missing node to the bulk power hubs. Perform a slow boot.
5. Does the problem persist?
- Yes:** Continue to the next step.
- No:** **This ends the procedure.**
6. Replace the Node Controllers (Un-Px-C41 or Un-Px-C42, where x = word 6 value) on the missing node. Perform a slow boot. **This ends the procedure.**

### 9119–FHA bulk power connection tables

Contains four cross reference tables that identifies the CEC node to bulk power hub, system controller to bulk power hub, bulk power controller to bulk power hub, and Hardware Management Console (HMC) bulk power hub connections.

Table 70. Node controller to bulk power hub connection table

CEC Node Location	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
Un refers to BPC location. Um refers to CEC location.				
P2	Um-P2-C41	Um-P2-C41-J01	Un-P1-C4-J18	
		Um-P2-C41-J02		Un-P1-C4-J18
	Um-P2-C42	Um-P2-C42-J01	Un-P1-C4-J17	
		Um-P2-C42-J02		Un-P2-C4-J17
P3	Um-P3-C41	Um-P3-C41-J01	Un-P1-C4-J12	
		Um-P3-C41-J02		Un-P1-C4-J12
	Um-P3-C42	Um-P3-C42-J01	Un-P1-C4-J11	
		Um-P3-C42-J02		Un-P2-C4-J11
P4	Um-P4-C41	Um-P4-C41-J01	Un-P1-C4-J10	
		Um-P4-C41-J02		Un-P1-C4-J10
	Um-P4-C42	Um-P4-C42-J01	Un-P1-C4-J09	
		Um-P4-C42-J02		Un-P2-C4-J09
P5	Um-P5-C41	Um-P5-C41-J01	Un-P1-C4-J22	
		Um-P5-C41-J02		Un-P1-C4-J22
	Um-P5-C42	Um-P5-C42-J01	Un-P1-C4-J21	
		Um-P5-C42-J02		Un-P2-C4-J21
P6	Um-P6-C41	Um-P6-C41-J01	Un-P1-C4-J20	
		Um-P6-C41-J02		Un-P1-C4-J20
	Um-P6-C42	Um-P6-C42-J01	Un-P1-C4-J19	
		Um-P6-C42-J02		Un-P2-C4-J19
P7	Um-P7-C41	Um-P7-C41-J01	Un-P1-C4-J16	
		Um-P7-C41-J02		Un-P1-C4-J16
	Um-P7-C42	Um-P7-C42-J01	Un-P1-C4-J15	

Table 70. Node controller to bulk power hub connection table (continued)

CEC Node Location	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
		Um-P7-C42-J02		Un-P2-C4-J15
P8	Um-P8-C41	Um-P8-C41-J01	Un-P1-C4-J14	
		Um-P8-C41-J02		Un-P1-C4-J14
	Um-P8-C42	Um-P8-C42-J01	Un-P1-C4-J13	
		Um-P8-C42-J02		Un-P2-C4-J13
P9	Um-P9-C41	Um-P9-C41-J01	Un-P1-C4-J24	
		Um-P9-C41-J02		Un-P1-C4-J24
	Um-P9-C42	Um-P9-C42-J01	Un-P1-C4-J23	
		Um-P9-C42-J02		Un-P2-C4-J23

Table 71. System controller to bulk power hub connection table

System controller (SC)	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
SC-A	Um-P1-C2	Um-P1-C2-J04	Un-P1-C4-J05	
		Um-P1-C2-J03		Un-P2-C4-J05
SC-B	Um-P1-C5	Um-P1-C5-J04	Un-P1-C4-J06	
		Um-P1-C5-J03		Un-P2-C4-J06

Table 72. Bulk power controller to bulk power hub connection table

Bulk Power Controller (BPC)	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
BPC-A	Un-P1-C1	Un-P1-C2-J02	Un-P1-C4-J07	
		Un-P1-C2-J03		Un-P2-C4-J07
BPC-B	Un-P2-C1	Un-P1-C5-J02	Un-P1-C4-J08	
		Un-P1-C5-J03		Un-P2-C4-J08

Table 73. Hardware management console (HMC) bulk power hub connection table

HMC	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
HMC-A	Un-P1-C4-J01	
HMC-B		Un-P2-C4-J01

## 9125–F2A bulk power connection tables

Contains two cross reference tables that identifies the CEC node to bulk power hub and the bulk power controller to bulk power hub connections.

Table 74. CEC node to bulk power hub connection table

CEC Node Location	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
Un refers to BPC location. 01-17 refers to CEC node frame location.				
(01)	U01-P1	U01-P1-T10	Un-P1-C4-J24	
		U01-P1-T11		Un-P2-C4-J24
(02)	U03-P1	U03-P1-T10	Un-P1-C4-J23	
		U03-P1-T11		Un-P2-C4-J23
(03)	U05-P1	U05-P1-T10	Un-P1-C4-J22	
		U05-P1-T11		Un-P2-C4-J22
(04)	U07-P1	U07-P1-T10	Un-P1-C4-J21	
		U07-P1-T11		Un-P2-C4-J21
(05)	U09-P1	U09-P1-T10	Un-P1-C4-J20	
		U09-P1-T11		Un-P2-C4-J20
(06)	U11-P1	U11-P1-T10	Un-P1-C4-J19	
		U11-P1-T11		Un-P2-C4-J19
(07)	U13-P1	U13-P1-T10	Un-P1-C4-J18	
		U13-P1-T11		Un-P2-C4-J18
(08)	U15-P1	U15-P1-T10	Un-P1-C4-J17	
		U15-P1-T11		Un-P2-C4-J17
(09)	U17-P1	U17-P1-T10	Un-P1-C4-J16	
		U17-P1-T11		Un-P2-C4-J16
(10)	U19-P1	U19-P1-T10	Un-P1-C4-J15	
		U19-P1-T11		Un-P2-C4-J15
(11)	U21-P1	U21-P1-T10	Un-P1-C4-J14	
		U21-P1-T11		Un-P2-C4-J14
(12)	U23-P1	U23-P1-T10	Un-P1-C4-J13	
		U23-P1-T11		Un-P2-C4-J13
(13)	U25-P1	U25-P1-T10	Un-P1-C4-J12	
		U25-P1-T11		Un-P2-C4-J12
(14)	U27-P1	U27-P1-T10	Un-P1-C4-J11	
		U27-P1-T11		Un-P2-C4-J11
(15)	U29-P1	U29-P1-T10	Un-P1-C4-J10	
		U29-P1-T11		Un-P2-C4-J10
(16)	U31-P1	U31-P1-T10	Un-P1-C4-J09	
		U31-P1-T11		Un-P2-C4-J09

Table 75. Bulk power controller to bulk power hub connection table

Bulk Power Controller (BPC)	FRU Location	FRU Connector Location	Bulk Power Hub (BPH) Side A Connector Location	Bulk Power Hub (BPH) Side B Connector Location
-----------------------------	--------------	------------------------	--	--

Table 75. Bulk power controller to bulk power hub connection table (continued)

BPC-A	Un-P1-C1	Un-P1-C2-J02	Un-P1-C4-J07	
		Un-P1-C2-J03		Un-P2-C4-J07
BPC-B	Un-P2-C1	Un-P1-C5-J02	Un-P1-C4-J08	
		Un-P1-C5-J03		Un-P2-C4-J08

## FSPSP63

The system has experienced a power error. Please review previous error logs for power-related issues.

## FSPSP64

All the processor support interface (PSI) links of the system are either nonfunctional or deconfigured, so the system cannot perform an IPL appropriately. Look for previous error logs that deconfigure hardware.

## FSPSP66

Use this procedure when a system with redundant service processors was booted with service processor fail-over disabled.

If you are servicing a system that contains redundant service processors and you booted the system with the fail-over disabled, perform the following steps.

1. Shut down the system.
2. Use the hardware management console (HMC) to enable fail-over.
3. Reboot the system. Verify that the SRC that sent you here was not logged during this boot.

## FSPSPC1

If the system hangs after the code that sent you to this procedure appears in the control panel, perform these steps to reset the service processor.

To perform the correct FSPSP27 for the system that you are servicing, select your machine type and model (system) from among the following:

8203-E4A, 9407-M15, and 9408-M25  
 8204-E8A and 9409-M50  
 8234-EMA, 9117-MMA, and 9406-MMA  
 9125-F2A  
 9119-FHA

### 8203-E4A, 9407-M15, and 9408-M25

**Attention:** You should periodically check the system firmware level on all your servers and update the firmware to the latest level, if appropriate. If you were directed to this procedure because the server displayed B1817201, C1001014, or C1001020, or a combination of these codes, the latest firmware can help avoid a recurrence of this problem.

Even if the customer cannot update the firmware on this system at this time, all of their systems should be updated to the latest firmware level as soon as possible to help prevent this problem from occurring on other systems.

### Resetting the service processor on systems with a physical control panel

1. If the Advanced System Management Interface (ASMI) is available, reset the service processor using the ASMI menus.

Were you able to use the ASMI menus to reset the service processor?

**Yes: This ends the procedure.**

**No:** Continue with the next step.

2. Activate the service processor pinhole reset switch on the system's control (operator) panel by carefully performing these steps:
  - a. Using an insulated paper clip, unbend the paper clip so that it has a straight section about 2 inches long.
  - b. Insert the clip straight into the hole, keeping the clip perpendicular to the plastic bezel.
  - c. When you engage the reset switch, you should feel the detent of the switch. Pressing the reset switch resets the service processor and causes the system to shut down.
3. Reboot the system in slow mode from the permanent side, using control panel function 02 or the ASMI menus, if available.
4. If the hang repeats, verify whether there is a firmware update that is available that fixes the problem; apply if available. For more information, see:
  - If the system is managed by an HMC, see the Upgrading the machine code on an HMC from Version 6 to Version 7.
  - If the system is not managed by an HMC, see the Managing the Advanced System Management Interface.
5. Choose from the following options:
  - If no firmware update is available, continue with the next step.
  - If a firmware update is available, apply it using the Service Focal Point in the Hardware Management Console (HMC), if attached.

Did the update resolve the problem so that the system now boots?

**Yes: This ends the procedure.**

**No:** You are here because there is no HMC attached to the system, the flash update failed, or the updated firmware did not fix the hang. Continue with the next step.

6. Choose from the following options:
  - If you are a customer, contact your authorized hardware service provider. **This ends the procedure.**
  - If you are the authorized hardware service provider, continue with the next step.
7. Replace the service processor (see System FRU locations).
8. If replacing the service processor does not fix the problem, contact your next level of support. **This ends the procedure.**

#### **8234-EMA, 9117-MMA, and 9406-MMA**

Are you servicing a model 570 with multiple drawers?

**Yes:** Verify that the anchor VPD card is present in the first (top) drawer, and that an anchor VPD card is not installed in any of the other processor drawers. If there are problems with the configuration of the anchor VPD card, correct them, and reapply AC power. If the service processor comes up to standby mode, this ends the procedure. If the service processor still fails early in the boot process, or the anchor VPD card was configured correctly, continue to the next step.

**No:** Continue with the next step. Select the procedure that applies to the system on which you are working.

- Systems with a physical control panel .
- Systems with a logical control panel.

#### **Resetting the service processor on systems with a physical control panel**

1. If the Advanced System Management Interface (ASMI) is available, reset the service processor using the ASMI menus. Were you able to use the ASMI menus to reset the service processor?

**Yes:** This ends the procedure.

**No:** Continue with the next step.

2. Activate the service processor pinhole reset switch on the system's operator panel by carefully performing these steps:
  - a. Using an insulated paper clip, unbend the clip so that it has a straight section about two inches long.
  - b. Insert the clip straight into the hole, keeping the clip perpendicular to the plastic bezel.
  - c. When you engage the reset switch, you should feel the detent of the switch. Pressing the reset switch resets the service processor and causes the system to shut down.
3. Reboot the system in slow mode from the permanent side using control panel function 02 or the ASMI menus, if available.
4. If the hang repeats, check with service support to see if a firmware update is available that fixes the problem. For more information, see Upgrading the machine code on an HMC from Version 6 to Version 7.
5. Choose from the following options:
  - If no firmware update is available, continue with the next step.
  - If a firmware update is available, apply it using the Hardware Management Console (HMC). Did the update resolve the problem so that the system now boots?

**Yes:** This ends the procedure.

**No:** You are here because there is no HMC attached to the system, the flash update failed, or the updated firmware did not fix the hang. Continue with the next step.

6. Choose from the following options:
  - If you are a customer, contact your authorized hardware service provider. This ends the procedure.
  - If you are a customer and your system has a secondary service processor, use the HMC to initiate a service processor failover and continue to bring up the system. Contact your authorized service provider to schedule deferred maintenance on the service processor that is not working. This ends the procedure.
  - If you are the authorized hardware service provider, continue with the next step.
7. Replace the service processor. See System FRU locations for information on the FRU location for the system that you are servicing.
8. If replacing the service processor does not fix the problem, contact your next level of support. **This ends the procedure.**

### Resetting the service processor on systems with a logical control panel

1. Reset the service processor. Use the Advanced System Management Interface (ASMI) menus, if available, or the Hardware Management Console (HMC) first to remove then to reapply power to the service processor.
2. Using the setting in the ASMI menu, reboot the system in slow mode from the permanent side.
3. If the hang repeats, check with service support to see if a firmware update is available that fixes the problem. For more information, see Upgrading the machine code on an HMC from Version 6 to Version 7.
4. Choose from the following options:
  - If no firmware update is available, continue with the next step.
  - If a firmware update is available, apply it using the Hardware Management Console (HMC). Did the update resolve the problem so that the system now boots?

**No:** You are here because there is no HMC attached to the system, the flash update failed, or the updated firmware did not fix the hang. Continue with the next step.

**Yes:** This ends the procedure.

5. Choose from the following options:
  - If you are a customer, contact your authorized hardware service provider. This ends the procedure.
  - If you are a customer and your system has a secondary service processor, use the HMC to initiate a service processor failover and continue to bring up the system. Contact your authorized service provider to schedule deferred maintenance on the service processor that is not working. This ends the procedure.
  - If you are the authorized hardware service provider, continue with the next step.
6. Replace the service processor. See System FRU locations for information on the FRU location for the system that you are servicing.
7. If replacing the service processor does not fix the problem, contact your next level of support. **This ends the procedure.**

#### 9125-F2A

1. Reset the service processor. Use the Advanced System Management Interface (ASMI) menus, if available, or the Hardware Management Console (HMC) first to remove power and then to reapply power to the processor node.
2. Using the setting in the ASMI menu, reboot the system in slow mode from the permanent side.
3. If the hang repeats, check with service support to see if a firmware update is available that fixes the problem. For more information, see Upgrading the machine code on an HMC from Version 6 to Version 7.
4. Choose from the following options:
  - If no firmware update is available, continue with the next step.
  - If a firmware update is available, apply it using the Service Focal Point in the HMC.
  - Did the update resolve the problem so that the system now boots?
    - No:** You are here because there is no HMC attached to the system, the flash update failed, or the updated firmware did not fix the hang. Continue with the next step.
    - Yes:** **This ends the procedure.**
5. Choose from the following options:
  - If you are a customer, contact your hardware service provider. This ends the procedure.
  - If you are a service provider, replace the service processor (symbolic FRU SVCPROC). If replacing the service processor does not fix the problem, contact your next level of support. **This ends the procedure.**

#### 9119-FHA

1. Reset the service processor. Use the Advanced System Management Interface (ASMI) menus, if available, or the Hardware Management Console (HMC) first to remove then to reapply power to the processor node.
2. Using the setting in the ASMI menu, reboot the system in slow mode from the permanent side.
3. If the hang repeats, check with service support to see if a firmware update is available that fixes the problem. See Getting fixes in the Customer service and support topic for details.
4. Choose from the following options:
  - If no firmware update is available, continue with the next step.
  - If a firmware update is available, apply it using the Service Focal Point in the HMC. Did the update resolve the problem so that the system now boots?
    - No:** You are here because there is no HMC attached to the system, the flash update failed, or the updated firmware did not fix the hang. Continue with the next step.
    - Yes:** **This ends the procedure.**
5. Choose from the following options:

- If you are a customer, and your system has only one system controller, contact your hardware service provider. **This ends the procedure.**
  - If you are a customer, and your system has a secondary system controller, use the HMC to initiate a service processor failover and continue to bring up the system. Contact your service provider to schedule deferred maintenance on the service processor that is hung. **This ends the procedure.**
  - If you are a hardware service provider, continue with the next step.
6. Replace the system controller (symbolic FRU SYSCONTR).
  7. If replacing the system controller does not fix the problem, contact your next level of support. **This ends the procedure.**

## FSPSPD1

If the system hangs after the code that sent you to this procedure appears in the control panel, perform these steps to reset the service processor.

Perform “FSPSPC1” on page 265.

---

## Tape unit isolation procedures

This topic contains the procedures necessary to isolate a failure in a tape device.

In these procedures, the term *tape unit* may be any one of the following:

- An internal tape drive, including its electronic parts and status indicators
- An internal tape drive, including its tray, power regulator, and AMDs
- An external tape drive, including its power supply, power switch, power regulator, and AMDs

You should interpret the term *tape unit* to mean the tape drive you are working on. However, these procedures use the terms *tape drive* and *enclosure* to indicate a more specific meaning.

Read and observe all safety procedures before servicing the system and while performing the procedures in this topic. Unless instructed otherwise, always power off the system or expansion unit where the FRU is located (see Powering on and powering off the system ) before removing, exchanging, or installing a field-replaceable unit (FRU).

## DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

## TUPIP02

Use this procedure to perform the 8mm tape drive read self-test and hardware self-test.

The write test is performed in "TUPIP03" on page 272.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem (see Determining if the system has logical partitions).
2. Press the **Unload** switch on the front of the 8mm tape drive. Is a data cartridge present?
  - **No:** Continue with the next step.
  - **Yes:** Attempt to remove the data cartridge. Can you remove the data cartridge?
    - Yes:** Continue with the next step.
    - No:** The tape drive is the failing part. Go to (Tape cartridge - Manual removal). After removing the data cartridge, exchange the tape drive (see System FRU locations). **This ends the procedure.**
3. Clean the tape drive by using the cleaning cartridge (part 16G8467). If the tape drive ejects the cleaning cartridge with the Disturbance light on, a new cleaning cartridge is needed. The tape drive unloads automatically when cleaning is complete. Cleaning takes up to 5 minutes.

Is the Disturbance light on continuously?

**No:** Continue with the next step.

**Yes:** Repeat this step while using a new cleaning cartridge. If you are using a new cleaning cartridge and the Disturbance light does not go off, the possible failing part is the 8mm tape drive. Go to "TUPIP03" on page 272. **This ends the procedure.**

4. Is the Disturbance light blinking?

• **No:** Continue with the next step.

• **Yes:** Choose from the following:

– If the 8mm tape drive is a type 6390, the possible failing part is the 6390 tape drive.

– If the 8mm tape drive is a type 7208, the possible failing parts are:

a. 7208 tape drive

b. Power supply

c. AMD

Go to "TUPIP03" on page 272. **This ends the procedure.**

5. Perform the read self-test:

**Notes:**

a. The 8mm tape drive read self-test and hardware self-test can take up to 5 minutes to run.

b. The tape drive runs the read self-test first. During the read self-test, the Read-Write light blinks, and the Disturbance and Ready lights are off.

To start the read self-test and hardware self-test, insert the diagnostic cartridge (part 46G2660) into the tape drive. The following conditions indicate that the read self-test ended successfully:

• The Read-Write light stops blinking.

• The diagnostic cartridge ejects automatically.

• The three status lights go on to indicate the start of the hardware test.

Does the read self-test end successfully?

• **No:** Does the tape drive eject the diagnostic cartridge?

– **Yes:** Continue with the next step.

– **No:** The tape drive is the failing part.

Go to (Tape cartridge - Manual removal). After removing the diagnostic cartridge, exchange the tape drive (see System FRU locations). **This ends the procedure.**

• **Yes:** Go to step 8 on page 272.

6. Is the Disturbance light blinking approximately four times per second?

• **No:** Continue with the next step.

• **Yes:** The possible failing part is the diagnostic cartridge (part 46G2660).

– If this is your first time through this step, get a new diagnostic cartridge. Go to step 3 on page 270 of this procedure to clean the tape drive again. Afterwards, run the read self-test and hardware self-test while using the new diagnostic cartridge.

– If this is your second time through this step, the possible failing part is the 8mm tape drive. Go to "TUPIP03" on page 272. **This ends the procedure.**

7. The Disturbance light is blinking approximately once per second.

• If the 8mm tape drive is a type 6390, the possible failing part is the 6390 tape drive.

• If the 8mm tape drive is a type 7208, the possible failing parts are:

a. 7208 tape drive

b. Power supply

c. AMD

Go to "TUPIP03" on page 272. **This ends the procedure.**

8. The tape drive runs the hardware self-test. During the hardware self-test, the three tape drive status lights are on for 15 to 30 seconds. The three status lights go off when the hardware self-test ends successfully.

Does the hardware self-test end successfully?

- **Yes:** Continue with the next step.
- **No:** When the hardware self-test does not end successfully, the following conditions occur:
  - The three status lights do not go off.
  - The Ready and Read-Write lights go off.
  - The Disturbance light blinks approximately once per second.

Possible failing parts are:

- If the 8mm tape drive is a type 6390, the possible failing part is the 6390 tape drive.
- If the 8mm tape drive is a type 7208, the possible failing parts are:
  - a. 7208 tape drive
  - b. Power supply
  - c. AMD

Go to “TUPIP03.” **This ends the procedure.**

9. The read self-test and hardware self-test ended successfully.

Was the user’s original tape identified as the probable cause of failure?

- **Yes:** Perform the following:
  - a. Mark and date the data cartridge to indicate that it failed with a permanent error.
  - b. Discard this data cartridge when:
    - Volume statistics (if available) indicate a problem with the data cartridge.
    - A total of three permanent errors have occurred with the same data cartridge.
  - c. If possible, continue operations with a new data cartridge.

Go to “TUPIP03.” **This ends the procedure.**

- **No:** Go to “TUPIP03.” **This ends the procedure.**

## TUPIP03

You were directed here because you may need to exchange a failing part.

The failing part was determined from one of the following:

- Other problem isolation procedures
- The *Failing item* column of the tape unit reference code table
- Tape unit service guide

**Note:** Occasionally, the system is available but not performing an alternate IPL (type D IPL). In this instance, any hardware failure of the tape unit I/O processor, or any device attached to it is not critical. With the exception of the loss of the affected devices, the system remains available.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem (see Determining if the system has logical partitions).
2. Do you need to exchange a possible failing device?
  - **No:** Do you need to exchange the tape unit I/O processor?
    - No:** Continue with the next step.
    - Yes:** Exchange the tape unit I/O processor. See System FRU locations. When you have completed the remove and replace procedure, continue with the next step.
  - **Yes:** Perform the following:
    - For an internal tape unit, go to System FRU locations for information on system FRU locations.

- For an external tape unit, go to the remove and replace procedures in the device service information.
3. Are you working with a tape unit in the system unit or in an expansion unit?
    - **Yes:** Is the system available, and can you enter commands on the command line?
      - No:** Continue with the next step.
      - Yes:** Go to step 9.
    - **No:** Continue with the next step.
  4. Display the selected IPL type.  
Is the displayed IPL type D?
    - **No:** Do you want to perform an alternate IPL (type D)?
      - No:** Continue with the next step.
      - Yes:** Go to step 6.
    - **Yes:** Go to step 6.
  5. Perform an IPL from disk by doing the following:
    - a. Power off the system. See Powering on and powering off the system .
    - b. Select IPL type A in manual mode.
    - c. Power on the system.
    - d. Go to step 8.
  6. Place the first tape of the latest set of SAVSYS tapes or SAVSTG tapes, or the first Software Distribution tape in the alternate IPL tape drive. The tape drive automatically becomes ready for the IPL operation (this may take several minutes).
  7. Perform an alternate IPL by doing the following:
    - a. Power off the system.
    - b. Select IPL type D in Manual mode.
    - c. Power on the system.
  8. The IPL may take one or more hours to complete.  
Does an unexpected reference code appear on the control panel, and is the System Attention light on?
    - **No:** Does the IPL complete successfully?
      - Yes:** Continue with the next step.
      - No:** Perform problem analysis to continue analyzing the problem. **This ends the procedure.**
    - **Yes:** Go to step 10.
  9. Perform the following to test the tape unit:
    - a. Enter VFYTAP (the Verify Tape command) on the command line.
    - b. Follow the prompts on the Verify Tape displays, then return here and answer the following question.  
Does the VFYTAP command end successfully?
      - No:** Continue with the next step.
      - Yes:** **This ends the procedure.**
  10. Record the SRC.  
Is the SRC the same one that sent you to this procedure?
    - Yes:** You cannot continue to analyze the problem. Use the original SRC and exchange the FRUs. Begin with the FRU which has the highest percent of probable failure (see the failing item list for this reference code). **This ends the procedure.**
    - No:** A different SRC occurred. Use the new SRC to correct the problem. **This ends the procedure.**

## TUPIP04

Use this procedure to reset an IOP and its attached tape units. Read the (overview) before continuing with this procedure.

If disk units are attached to an IOP, you must power off the system, then power it on to reset the IOP.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem (see Determining if the system has logical partitions).
2. Is the tape unit powered on?
  - **No:** Continue with the next step.
  - **Yes:** Perform the following:
    - a. Press the Unload switch on the front of the tape unit you are working on.
    - b. If a data cartridge or a tape reel is present, do not load it until you need it.
    - c. Continue with the next step of this procedure.
3. Verify the following:
  - If the external device has a power switch, ensure that it is set to the **On** position.
  - Ensure that the power and external signal cables are connected correctly.

**Note:** For every 8mm and 1/4 inch tape unit, the I/O bus terminating plug for the SCSI external signal cable is connected internally. These devices do not need and should not have an external terminating plug.

4. Did you press the Unload switch in step 2?
  - **Yes:** Can you enter commands on the command line?
    - Yes:** Continue with the next step.
    - No:** Go to step 11 on page 276.
  - **No:** Press the **Unload** switch on the front of the tape unit you are working on. If a data cartridge or a tape reel is present, do not load it until you need it. Continue with the next step of this procedure.
5. Has the tape unit operated correctly since it was installed? If you do not know, continue with the next step of this procedure.
  - Yes:** Continue with the next step.
  - No:** Go to step 11 on page 276.
6. If a system message displayed an I/O processor name, a tape unit resource name, or a device name, record the name for use in the next step. You may continue without a name.

Does the I/O processor give support to only one tape unit? If you do not know, continue with the next step of this procedure.

  - **No:** Continue with the next step.
  - **Yes:** Perform the following. You must complete all parts of this step before you press **Enter**.
    - a. Enter  
WRKCFGSTS \*DEV \*TAP ASTLVL(\*INTERMED)  
  
(the Work with Configuration Status command) on the command line.
    - b. If the device is not varied off, select **Vary off** before continuing.
    - c. Select **Vary on** for the failing tape unit.
    - d. Enter  
RESET(\*YES)  
  
(the Reset command) on the command line.
    - e. Press **Enter**. **This ends the procedure.**

7. This step determines if the I/O processor for the tape unit gives support to other tape units or to a disk unit.

**Notes:**

- a. If you cannot determine the tape unit you are attempting to use, go to step **11** (See 11 on page 276).
- b. System messages refer to other tape units that the I/O processor gives support to as *associated devices*.

Enter WRKHDWRSC \*STG (the Work with Hardware Resources command) on the command line.

Did you record an I/O processor (IOP) resource name in step 6 on page 274?

- **No:** Perform the following:
  - a. Select **Work with resources** for each storage resource IOP (CMB01, SIO1, and SIO2 are examples of storage resource IOPs).
  - b. Find the Configuration Description name of the tape unit you are attempting to use, and then record the Configuration Description names of all tape units that the I/O processor gives support to.
  - c. Record whether the I/O processor for the tape unit also gives support to any disk unit resources.
  - d. Continue with the next step.
- **Yes:** Perform the following:
  - a. Select **Work with resources** for that resource.
  - b. Record the Configuration description name of all tape units for which the I/O processor provides support.
  - c. Record whether the I/O processor for the tape unit also gives support to any disk unit resources.
  - d. Continue with the next step.

8. Does the I/O processor give support to any disk unit resources?

**No:** Continue with the next step.

**Yes:** The **Reset** option is not available. Go to step 11 on page 276.

9. Does the I/O processor give support to only one tape unit?

- **No:** Continue with the next step.
- **Yes:** Perform the following:
  - a. Select **Work with configuration description** and press **Enter**.
  - b. Select **Work with status** and press **Enter**.

**Note:** You must complete the remaining parts of this step before you press **Enter** again.

- c. If the device is not varied off, select **Vary off** before continuing.
- d. Select **Vary on** for the failing tape unit.
- e. Enter RESET(\*YES) (the Reset command) on the command line.
- f. Press **Enter**. **This ends the procedure.**

10. Perform the following:

- a. Enter

```
WRKCFGSTS *DEV *TAP ASTLVL(*INTERMED)
```

(the Work with Configuration Status command) on the command line.

- b. Select **Vary off** for the failing tape unit and associated devices (the devices you identified in step 7), and then press **Enter**.

**Note:** You must complete the remaining parts of this step before you press **Enter** again.

c. Select **Vary on** for the failing tape unit.

d. Enter

RESET(\*YES)

(the Reset command) on the command line.

e. Press **Enter**.

f. Select **Vary on** for the associated devices (tape units) you identified in step 7 on page 275. It is not necessary to use the **Reset** option again.

Does a system message indicate that the vary on operation failed?

**Yes:** Continue with the next step.

**No:** **This ends the procedure.**

11. The **Reset** is not available, or you were not able to find the Configuration Description name when using

WRKHDWRSC \*STG

(the Work with Hardware Resources command).

You can perform an I/O processor (IOP) reset by performing an IPL of the I/O processor. All devices that are attached to the IOP will reset.

The following steps describe how to load an IOP, how to configure a tape drive, how to vary on tape devices, and how to make tape devices available.

12. Is the tape device you are working on an 8mm tape drive?

• **No:** Continue with the next step.

• **Yes:** Verify the following on the 8mm tape drive:

- The power and external signal cables are connected correctly.
- The Power switch is set to the On position (pushed in).

**Note:** The SCSI I/O bus terminating plug for the system-external signal cables is connected internally in the 8mm tape drive. The 8mm tape drive does not need, and must not have an external terminating plug.

Is the 8mm tape drive Power light on, and is the Disturbance light off?

**Yes:** Continue with the next step.

**No:** Go to "TUPIP02" on page 270 to correct the problem. **This ends the procedure.**

13. Is a data cartridge or a tape reel installed in the tape device?

**No:** Continue with the next step.

**Yes:** Remove the data cartridge or tape reel. Continue with the next step.

14. Can you enter commands on the command line?

• **Yes:** Continue with the next step.

• **No:** Perform the following:

- a. Power off the system. See Powering on and powering off the system .
- b. Power on the system.

The system performs an IPL and resets all devices. If the tape device responds to SCSI address 7, the system configures the tape device. **This ends the procedure.**

15. Verify that automatic configuration is on by entering

DSPSYSVAL QAUTOCFG

(the Display System Value command) on the command line.

Is the **Autoconfigure device** option set to 1?

• **Yes:** Continue with the next step.

- **No:** Perform the following:
    - a. Press **Enter** to return to the command line.
    - b. Set automatic configuration to On by entering  
CHGSYSVAL QAUTOCFG '1'  
(the Change System Value command) on the command line.  
  
**Note:** QAUTOCFG resets to its initial value in step 21 on page 278.
    - c. Continue with the next step.
16. Perform the following:
    - a. Enter  
STRSST  
  
(the Start SST command) on the command line.
    - b. On the Start Service Tools Sign On display, type in a User ID with QSRV authority and Password.
    - c. Select **Start a Service Tool** → **Hardware Service Manager** → **Logical Hardware Resources** → **System Bus Resources**. The Logical Hardware Resources on System Bus display shows all of the IOPs.
    - d. Find the IOP you want to reset. You **must** ensure that no one is using any of the tape units, communication channels, or display stations that are attached to the IOP you want to reset.  
Does a "\*" indicator appear to the right of the IOP description?
      - **No:** Continue with the next step.
      - **Yes:** Disk units are attached to the IOP.  
Perform the following:
        - a. Press **F3** until the Exit System Service Tools display appears.
        - b. Press **Enter**.
        - c. Power off the system. See Powering on and powering off the system .
        - d. Power on the system.  
The system performs an IPL and resets all devices. **This ends the procedure.**
  17. Perform the following:
    - a. Select **I/O debug** → **IPL the I/O processor**.
    - b. When the IOP reset is complete, continue with the next step of this procedure.
  18. Perform the following:
    - a. Press **F12** to return to the Logical Hardware Resources on System Bus display.
    - b. Select **Resources associated with IOP** for the IOP you reset.  
Did the IOP detect the tape unit?
      - **Yes:** Continue with the next step.
      - **No:** The IOP did not detect the tape unit. Consider the following:
        - Ensure that the tape unit is powered on and that the signal cables are connected correctly. If you find and correct a power or a signal cable problem, return to step 16.
        - The tape unit may be failing. Go to the tape unit service information and perform the procedures for analyzing device problems. If you find and correct a tape unit problem, return to step 16.
        - If none of the above are true, ask your next level of support for assistance. **This ends the procedure.**
  19. Press **F3** until the Exit System Service Tools display appears. Then press **Enter**.
  20. Was automatic configuration Off before you performed step 15 on page 276?

**Yes:** Continue with the next step.

**No:** **This ends the procedure.**

21. Enter

```
CHGSYSVAL QAUTOCFG '0'
```

(the Change System Value command) on the command line to reset QAUTOCFG to its initial value.

**This ends the procedure.**

## TUPIP06

Use this procedure to isolate a Device Not Found message during installation from an alternate device.

There are several possible causes:

- The alternate installation device was not correctly defined.
- The alternate installation device was not made ready.
- The alternate installation device does not contain installation media.
- The alternate installation device is not powered on.
- The alternate installation device is not connected properly.
- There is a hardware error on the alternate installation device or the attached I/O processor.

Read the danger notices in “Tape unit isolation procedures” on page 269 before continuing with this procedure.

1. Is the device that you are using for alternate installation defined as the alternate installation device?

- **Yes:** Is the alternate installation device ready?

**Yes:** Continue with the next step.

**No:** Make the alternate installation device ready and retry the alternate installation. **This ends the procedure.**

- **No:** Correct the alternate installation device information and retry the alternate installation. **This ends the procedure.**

2. Is there installation media in the alternate installation device?

- **Yes:** Is the alternate installation device an external device?

**Yes:** Continue with the next step.

**No:** Go to step 5.

- **No:** Load the correct media and retry the alternate installation. **This ends the procedure.**

3. Is the alternate installation device powered on?

- **Yes:** Make sure that the alternate installation device is properly connected to the I/O processor or I/O adapter card.

Is the alternate installation device properly connected?

**Yes:** Go to step 5.

**No:** Correct the problem and retry the alternate installation. **This ends the procedure.**

- **No:** Continue with the next step.

4. Ensure that the power cable is connected tightly to the power cable connector at the back of the alternate device. Ensure that the power cable is connected to a power outlet that has the correct voltage. Set the alternate device Power switch to the Power On position.

The Power light should go on and remain on. If a power problem is present, one of the following power failure conditions may occur:

- The Power light flashes, then remains off.
- The Power light does not go on.
- Another indication of a power problem occurs.

Does one of the above power failure conditions occur?

- **No:** The alternate device is powered on and runs its power-on self-test. Wait for the power-on self-test to complete.

Does the power-on self-test complete successfully?

**No:** Go to the service information for the specific alternate installation device to correct the problem. Then retry the alternate installation. **This ends the procedure.**

**Yes:** Retry the alternate installation. **This ends the procedure.**

- **Yes:** Perform the following:
  - a. Go to the service information for the specific alternate device to correct the power problem.
  - b. When you have corrected the power problem, retry the alternate installation. **This ends the procedure.**

5. Was a device error recorded in the Product Activity Log?

**No:** Contact your next level of support. **This ends the procedure.**

**Yes:** See Reference Code Finder to look up the device error record and correct the problem. **This ends the procedure.**

## Tape unit self-test procedure

This procedure is designed to allow you to quickly perform a complete set of diagnostic tests on a 6384 or 6387 tape unit.

The following procedure is designed to allow you to quickly perform a complete set of diagnostic tests on a 6384 or 6387 tape unit, without impacting your system operation. This test can also be used to verify good performance of individual tape cartridges.

Enter diagnostic mode:

1. Verify that a cartridge is not loaded in the tape unit. To unload a cartridge, press the **eject** button on the front of the tape unit. If the cartridge does not eject, refer to (Tape unit - manual removal).
2. Press and hold the **eject** button for about 6 seconds until the amber LED starts flashing slowly, then release the button. The amber (left) LED will flash, indicating that the tape unit is waiting for a cartridge to be inserted.

### Running the self-test

1. Self-testing begins when a scratch data cartridge is inserted into the tape unit. The Ready (left) LED will flash, indicating that self-testing is in progress.

**Note:** A cartridge must be loaded within 15 seconds, otherwise, the tape unit will automatically revert back to normal operation. If necessary, return to step 1 to reenter diagnostic mode.

2. For fastest results, we recommend using an SLR100 Test Tape (P/N 35L0967) which was originally provided with your System i server.

**Attention:** Use a blank cartridge that does not contain customer data. During this self-test, the cartridge will be rewritten with a test pattern and any customer data will be destroyed.

**Note:** Use a cartridge that is not write-protected. If a write-protected cartridge is inserted while the tape unit is in diagnostic mode, the cartridge will be ejected, see Incorrect cartridge below.

Self-testing will only be performed using a write-compatible cartridge type, and with a cartridge that is not damaged, see Incorrect cartridge below.

If a cleaning cartridge is inserted while the tape unit is in diagnostic mode, drive cleaning will occur and the tape unit will then return to normal operating mode. Return to step 1 to reenter diagnostic mode.

3. **At any time, self-testing can be stopped by pressing the eject button.** After the current operation is completed, the cartridge will be ejected and tape unit will return to normal operating mode.

4. The Ready (left) LED will continue to flash during the following:
  - The **cartridge load sequence** has an approximate duration of 30 seconds. The center LED indicates tape movement.
  - The **hardware test** has an approximate duration of 2 and 1/2 minutes. During that time, a static test is performed on tape unit electrical components. No tape motion occurs during this step.
  - The **cartridge load/unload test** has an approximate duration of 1 and 1/2 minutes. During that time, the Ready LED will continue to flash while a dynamic test is performed on tape unit mechanical components. Two cartridge load cycles are included.
  - Duration of the **write/read test** will vary, depending on what type of cartridge is loaded into the tape unit. When an SLR100 Test Tape is used, typical duration will be 5 minutes. Use of other cartridge types can increase the write/read test duration to 30-40 minutes. During this test, the Ready LED will continue to flash. The center LED indicates tape movement.

## Interpreting the results

**Test Passed:** When self-testing has completed successfully, and no problems are detected, the cartridge is unloaded from the tape unit and all LEDs are off. Proper function of both the tape unit and tape cartridge have now been verified.

**Note:** A solid amber light indicates that self-testing has completed successfully, but the tape unit requires cleaning. Clean the tape unit by inserting an Dry Process Cleaning Cartridge (P/N 35L0844).

**Test Failed:** The cartridge will remain loaded inside the tape unit, and the amber LED will flash when a problem is detected with either the tape unit or cartridge.

**Note:** To isolate failure to either tape unit or cartridge, return to step 1 on page 279 and repeat this self-test using a different scratch cartridge.

**Incorrect cartridge:** When the center (green) and right (amber) LEDs flash and a cartridge is unloaded, the tape unit has determined that an incorrect tape cartridge has been inserted, and self-testing cannot be performed. Verify that your tape cartridge is **not** one of the following:

- Write-protected
- Damaged
- Unsupported media type
- Media which is not write-compatible with tape unit.

Press the **eject** button, to end self-test and return the tape unit to normal operating mode. Then return to step 1 on page 279 and run the self-test using another cartridge, or one which is not write-protected. **This ends the procedure.**

## Tape device ready conditions

All the conditions that are listed for the device, must be correct for the device to be ready.

If the device is not ready, use the Action column or other instructions, and go to the service information for the specific tape device.

If the system has logical partitions, perform this procedure from the logical partition that reported the problem (see Determining if the system has logical partitions).

Table 76. Tape device ready conditions

Storage device	Ready description	Action
3480 or 3490	<ul style="list-style-type: none"> <li>• Power switch is set to the On position.</li> <li>• Power light is on.</li> <li>• DC Power light is on.</li> <li>• Control unit On-line switch is set to the On-line position.</li> <li>• Control unit Normal/Test switch is set to the Normal position.</li> <li>• Control unit channel Enable/Disable switch is set to the Enable position.</li> <li>• Tape unit On-line/Off-line switch is set to the On-line position.</li> <li>• Tape is loaded.</li> <li>• Tape unit displays Ready U or Ready F.</li> </ul>	See the <i>3480 Magnetic Tape Subsystem Operator's Guide</i> , SA32-0066, or <i>3490 Magnetic Tape Subsystem Operator's Guide</i> , SA32-0124, for instructions on making the tape unit ready.
7208	<ul style="list-style-type: none"> <li>• Power switch is on (pressed).</li> <li>• Power light is on.</li> <li>• Data cartridge is inserted.</li> <li>• Ready light is on.</li> <li>• System external signal cable is connected to the type 2621 I/O processor and to the 7208 tape drive.</li> </ul> <p><b>Note:</b> The SCSI I/O bus terminating plug for the system external signal cable is connected internally in the 7208 tape drive. The 7208 tape drive does not need, and must not have, an external terminating plug.</p>	See the <i>7208 8 mm Tape Drive Operator's Manual</i> for instructions on making the tape drive ready. If you cannot make the 7208 Model 012 tape drive ready, go to "TUPIP02" on page 270.
9348	<ul style="list-style-type: none"> <li>• Power switch is set to the On position.</li> <li>• Power light is on.</li> <li>• Tape is loaded.</li> <li>• Status display shows 00 A002.</li> <li>• On-line light is on.</li> </ul>	See the <i>9348 Customer Information manual</i> , SA21-9567, for instructions on making the tape unit ready. If you cannot make the tape unit ready, go to the "Analyzing Problems" section of <i>9348 Tape Unit Service Information</i> , SY31-0697.

## Twinaxial workstation I/O processor isolation procedure

Use the procedure below to isolate a failure which has been detected by the twinaxial workstation I/O processor. If you are using a personal computer, an emulation program must be installed and working.

Please read and observe all safety procedures before servicing the system and while performing the procedure below.

**Attention:** Unless instructed otherwise, always power off the system or expansion tower where the FRU is located (see Powering on and powering off the system ) before removing, exchanging, or installing a field-replaceable unit (FRU).

## DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

**Attention:** When instructed, remove and connect cables carefully. You may damage the connectors if you use too much force.

## TWSIP01

The workstation IOP detected an error.

Please read the danger notices in “Twinaxial workstation I/O processor isolation procedure” on page 281 before performing this procedure.

One of the following occurred:

- All of the workstations on one port are not working.
- All of the workstations on the system are not working.
- One of the workstations on the system is not working.
- The reference code table instructed you to perform this procedure.
- The Remote Operations Console is not working.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Are you using a workstation adapter console?

**Note:** A personal computer (used as a console) that is attached to the system by using a console cable feature is known as a workstation adapter console. The cable (part number 46G0450, 46G0479, or 44H7504) connects the system port on the personal computer to a communications I/O adapter on the system.

**No:** Continue with the next step.

**Yes:** Go to “WSAIP01” on page 289. **This ends the procedure.**

3. Is the device you are attempting to repair a personal computer (PC)?

**No:** Continue with the next step.

**Yes:** PC emulation programs operate and report system-to-PC communications problems differently. See the PC emulation information for details on error identification. Then, continue with the next step.

4. Perform the following steps:

- a. Verify that all the devices you are attempting to repair, the primary console, and any alternative consoles are powered on.
- b. Verify that the all the devices you are attempting to repair, the primary console, and any alternative consoles have an available status. For more information on displaying the device status, see Hardware service manager.
- c. Verify that the workstation addresses of all workstations on the failing port are correct. Each workstation on the port must have a separate address, from 0 through 6. See the workstation service information for details on how to check addresses.
- d. Verify that the last workstation on the failing port is terminated. All other workstations on that port must not be terminated.
- e. Ensure that the cables that are attached to the device or devices are tight and are not visibly damaged.
- f. If there were any cable changes, check them carefully.
- g. If all of the workstations on the system are not working, disconnect them by terminating at the console.
- h. Verify the device operation (see the device information for instructions).
- i. The cursor position can assist in problem analysis.
  - If the cursor is in the upper right corner, it indicates a communication problem between the workstation IOP and the device. Continue with the next step.
  - If the cursor is in the upper left corner, it indicates a communication problem between the workstation IOP and the operating system. Perform the following steps:
    - 1) Verify that all current PTFs are loaded.
    - 2) Ask your next level of support for assistance. **This ends the procedure.**

5. Is the system powered off?

**Yes:** Continue with the next step.

**No:** Go to step 8 on page 284.

6. Perform the following:

- a. Power on the system in **Manual** mode. See IPL type, mode, and speed options for details.
- b. Wait for a display to appear on the console or a reference code to appear on the control panel.

Does a display appear on the console?

• **No:** Continue with the next step.

• **Yes:** If you disconnected any devices after the console in step 4, perform the following:

- a. Power off the system.
- b. Reconnect one device.

**Note:** Ensure that you terminate the device you just reconnected and remove the termination from the device previously terminated.

- c. Power on the system.
- d. If a reference code appears on the control panel, go to step 9.
- e. If no reference code appears, repeat steps a through d of this step until you have checked all devices disconnected previously.
- f. Continue to perform the initial program load (IPL). **This ends the procedure.**

7. Does the same reference code that sent you to this procedure appear on the control panel?

**Yes:** Continue with the next step.

**No:** Perform problem analysis for this new problem. **This ends the procedure.**

8. Perform the following to make DST available:

- a. Ensure that **Manual** mode on the control panel is selected.
- b. Select function 21 **Make DST Available**.
- c. Check the console and any alternative consoles for a display.

Does a display appear on any of the console displays?

- **No:** Continue with the next step.
- **Yes:** If you disconnected any devices after the console in step 4 on page 283, perform the following:
  - a. Power off the system.
  - b. Reconnect one device.

**Note:** Ensure that you terminate the device you just reconnected and remove the termination from the previously terminated device.

- c. Power on the system.
- d. If a reference code appears on the control panel or on the HMC, go to step 9.
- e. If no reference code, repeat steps a through d of this step until you have checked all devices disconnected previously.
- f. Continue to perform the initial program load (IPL). **This ends the procedure.**

9. Ensure that the following conditions are met:

- The workstation addresses of all workstations on the failing port must be correct.

Each workstation on the port must have a separate address, from 0 through 6. See the workstation service information if you need help with checking addresses.

Did you find a problem with any of the above conditions?

**Yes:** Continue with the next step.

**No:** Go to step 11 on page 285.

10. Perform the following:

- a. Correct the problem.
- b. Select function 21 **Make DST Available**.
- c. Check the console and any alternative consoles for a display.

Does a display appear on any of the consoles?

- **Yes:** Continue to perform the IPL. **This ends the procedure.**
- **No:** Does the same reference code appear on the control panel?

**Yes:** Continue with the next step.

**No:** Perform problem analysis for this new problem. **This ends the procedure.**

11. Is the reference code one of the following: 0001, 0003, 0004, 0005, 0006, 0101, 0103, 0104, 0105, 0106, 5004, 5082, B000, D010, or D023?
  - No:** Continue with the next step.
  - Yes:** Go to step 15.
12. Does the system have an alternative console on a second workstation IOP?
  - Yes:** Continue with the next step.
  - No:** Go to step 14.
13. There is either a Licensed Internal Code problem, or there are two device failures on the workstation IOPs, consoles, or cables. The console and any alternative consoles are the most probable causes for this failure.
  - See the service information for the failing display to attempt to correct the problem. If a display is connected to the system by a link protocol converter, use the link protocol converter information to attempt to correct the problem. The link protocol converter may be the failing item.
  - If you have another working display, you can exchange the console and alternative consoles and perform an IPL to attempt to correct the problem.
  - Exchange the following parts one at a time until you determine the failing item:
    - a. Console
    - b. Alternative console
    - c. Cables
    - d. Workstation IOA for the console
    - e. The multi-adapter bridge. **This ends the procedure.**
14. The console, cables, or the workstation IOP card is the most probable causes for this failure. If the console is connected to the system by a link protocol converter, the link protocol converter is possibly the failing item. Use one or more of the following options to correct the problem:
  - a. See the service information for the failing displays for more information. If a display is connected to the system by a link protocol converter, see the link protocol converter information to attempt to correct the problem.
  - b. If you have another working display, you can exchange the console and perform an IPL to attempt to correct the problem.
  - c. Exchange the following parts one at a time until you determine the failing item:
    - 1) Console
    - 2) Workstation IOA
    - 3) The multi-adapter bridge.
    - 4) Twinaxial attachment (cable) **This ends the procedure.**
15. To continue problem analysis, use a port tester, part 93X2040 or 59X4262, which you may have with your tools or the customer may have one. The port tester has either two or three lights.

Is a port tester available?

  - **Yes:** Continue with the next step.
  - **No:** Check or exchange the cables from the system to the failing display. Did this correct the problem?
    - Yes:** You corrected the problem. **This ends the procedure.**
    - No:** Go to step 12.
16. To use the port tester to isolate the problem, perform the following:
  - Verify that the port tester is operating correctly by doing a self-test. A self-test can be made at any time, even when the port tester is attached to a port or cable. Perform the following steps to do a self-test:
    - a. Move the selector switch to the center (0) position.

- b. Push and hold the test button until all lights go on. The yellow lights should go on immediately, and the green light should go on approximately 5 seconds later. The port tester is ready for use if all lights go on.
  - Leave the system power on.
17. Find the input cable to the failing console or port.  
Is the failing console or the failing port attached to a protocol converter?
- **No:** Perform the following:
    - a. Disconnect the input cable from the failing console.
    - b. Connect the port tester to the input cable.
    - c. Continue with the next step.
  - **Yes:** Perform the following:
    - a. Disconnect the cable that comes from the system at the protocol converter.
    - b. Connect the port tester to the cable.
    - c. Continue with the next step.
18. Perform the following:
- a. Set the selector switch on the port tester to the left (1) position for a twinaxial connection. Set the switch to the right (2) position for a twisted pair connection.
  - b. Press and hold the test switch on the port tester for 15 seconds and observe the lights.
  - c. Choose from the following options:
    - If the port tester has **three** lights, do the following:
      - If only the top (green) light is on, go to step 27 on page 287.
      - If both the top (green) and center (yellow) lights are on, go to step 20.
- Note:** The center (yellow) light is always on for twisted pair cable and may be on for fiber-optical cable.
- If only the bottom (yellow) light is on, go to step 21.
  - If all lights are off, go to step 22.
  - If all lights are on, go to step 19.
  - If the port tester has **two** lights, do the following:
    - If only the top (green) light is on, go to step 27 on page 287.
    - If only the bottom (yellow) light is on, go to step 21.
    - If both lights are off, go to step 22.
    - If both lights are on, continue with the next step.
19. The tester is in the self-test mode. Check the position of the selector switch.
- If the selector switch is not in the correct position, go to step 18.
  - If the selector switch is already in the correct position, the port tester is not working correctly. Exchange the port tester, and go to step 16 on page 285.
20. The cable you are testing has an open shield.
- Note:** The open shield can be checked only on the cable from the twinaxial workstation attachment to the device or from device to device. Only one section of cable can be checked at a time. See the SA41-3136, Port Tester Use information.
- This ends the procedure.**
21. The cable network is bad. The wires in the cable between the console and the twinaxial workstation attachment are reversed. Go to step 26 on page 287.
22. Perform the following:
- a. Find the twinaxial workstation attachment to which the failing console is attached.

- b. Disconnect the cable from port 0 on that twinaxial workstation attachment.
  - c. Connect the port tester to port 0 on the attachment.
  - d. Set the selector switch on the port tester to the left (1) position.
23. Perform the following:
- a. Press and hold the test switch on the port tester for 15 seconds and observe the lights.
  - b. If the port tester has **three** lights, do the following:
    - If both the top (green) and center (yellow) lights are on, continue with step 24.

**Note:** The center (yellow) light is always on for twisted pair cable and may be on for fiber-optical cable.

    - If only the bottom (yellow) light is on, continue with step 24.
    - If all lights are off, continue with step 24.
    - If only the top (green) light is on, go to step 26.
    - If all lights are on, go to step 25.
  - c. If the port tester has **two** lights, do the following:
    - If only the top (green) light is on, go to step 26.
    - If only the bottom (yellow) light is on, continue with step 24.
    - If both lights are off, continue with step 24.
    - If both lights are on, go to step 25.
24. The test indicated that there was no signal from the system. Reconnect the cable you disconnected and perform the following:
- a. Exchange the following parts:
    - 1) Twinaxial workstation IOA card
    - 2) The multi-adapter bridge.
  - b. Power on the system to perform an IPL. **This ends the procedure.**
25. The tester is in the self-test mode. Check the position of the selector switch:
- If the selector switch is not in the left (1) position, set the switch to the left (1) position. Then go to step 23.
  - If the selector switch is already in the left (1) position, the port tester is not working correctly. Exchange the port tester and go to step 22 on page 286.
26. The cable to the workstation is the failing item. Cable maintenance is a customer responsibility. The cable must be repaired or exchanged. Then, power on the system to perform an IPL. **This ends the procedure.**
27. The port tester detects most problems, but it does not always detect an intermittent problem or some cable impedance problems. The tester may indicate a good condition, although there is a problem with the workstation IOP card or cables.
- a. If the failing display is connected to a link protocol converter, the link protocol converter is the failing item. See the link protocol converter service information to correct the problem.
  - b. Exchange the following parts:
    - 1) Console
    - 2) Twinaxial workstation IOA
    - 3) The multi-adapter bridge.
    - 4) Cables
  - c. If you have another working display, you can exchange the console and perform an IPL to attempt to correct the problem. See the service information for the failing display for more information.
  - d. If exchanging the failing items did not correct the problem and the reference code was a 5002, 5082, or 50FF, there may be a Licensed Internal Code problem. Go to “LICIP03” on page 101.

- e. The problem may be caused by devices that are attached after the console on port 0. **This ends the procedure.**

---

## **Workstation adapter isolation procedure**

Isolates a failure that is detected by the workstation adapter, and is used when no display is available with which to perform on-line problem analysis.

The workstation adapter detected a problem while communicating with the workstation that is used as the primary console.

**Note:** If you are using a PC, you must install an emulation program.

Please read and observe all safety procedures before servicing the system and while performing the procedure below.

**Attention:** Unless instructed otherwise, always power off the system or expansion tower where the FRU is located (see Powering on and powering off the system ) before removing, exchanging, or installing a field-replaceable unit (FRU).

## DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

## WSAIP01

Isolate a console keyboard error that contains a "K" on the display.

**Note:** If the console has a keyboard error, there may be a "K" on the display. See the workstation service information for more information.

Perform the following procedure from the logical partition that reported the problem:

1. Select the icon on the workstation to make it the console (you may have already done this). You must *save* the console selection.
2. Access Dedicated Service Tools (DST) by performing the following:
  - a. Select **Manual** mode on the control panel.
  - b. Use the selection switch on the control panel to display function 21, **Make DST Available**, and press **Enter** on the control panel.
  - c. Wait for a display to appear on the console or for a reference code to appear on the control panel.

Does a display appear on the console?

**No:** Continue with the next step.

**Yes:** The problem is corrected. **This ends the procedure.**

3. Isolate the problem to one server and one workstation (console) by performing the following:
  - a. Disconnect the power cable from the workstation.
  - b. Eliminate all workstations, cables, and connector boxes from the network except for one server, one console, two connector boxes, and one cable.
  - c. Ensure that the cables that are connected to the console, the keyboard, and the server are connected correctly and are not damaged.
4. Perform the following:
  - a. Ensure that the server console is terminated correctly.
  - b. Set the Power switch on the console to the **On** position.
  - c. Select the **SNA\*PS** icon on the console.
  - d. See the workstation information for more information.
5. Access DST by performing the following:
  - a. Select **Manual** mode on the control panel.
  - b. Use the selection switch on the control panel to display function 21, **Make DST Available**, and press **Enter** on the control panel.
  - c. Wait for a display to appear on the console or for a reference code to appear on the control panel.Does a display appear on the console?

**No:** Continue with the next step.

**Yes:** The problem is in a cable, connector box, or device you disconnected in step 3. **This ends the procedure.**
6. Does the reference code A600 5005 appear on the control panel?

**Yes:** Continue with the next step.

**No:** Perform problem analysis using this reference code. **This ends the procedure.**
7. Do you have another workstation, cable, and two connector boxes you can exchange with the workstation connected to the server?
  - **Yes:** Continue with the next step.
  - **No:** One of the following is causing the problem:

**Note:** The items at the top of the list have a higher probability of fixing the problem than the items at the bottom of the list.

    - Workstation adapter Licensed Internal Code
    - Workstation adapter configuration
    - Workstation
    - Cable
    - Connector box
    - Workstation IOA
    - Workstation IOPIf you still have not corrected the problem, ask your next level of support for assistance. **This ends the procedure.**
8. Repeat steps 3 through 7 of this procedure, using a different workstation, cable, and connector boxes. Do you still have a problem?

**Yes:** Continue with the next step.

**No:** The problem is in the cable, connector boxes, or workstation you disconnected. **This ends the procedure.**
9. One of the following is causing the problem:

**Note:** The items at the top of the list have a higher probability of fixing the problem than the items at the bottom of the list.

- Workstation adapter Licensed Internal Code
- Workstation adapter configuration
- Workstation IOA
- Communications IOP

To bring up a workstation other than the console, perform the following:

- a. Connect another workstation into this network.
- b. Select **Normal** mode on the control panel.
- c. Perform an IPL.

If the sign-on display appears, the following parts are good:

- Communications IOP
- Workstation IOA

**Note:** If a printer connected to this assembly is not working correctly, it may look like the display is bad. Perform a self-test on the printer to ensure that it prints correctly (see the printer service information).

If you still have not corrected the problem, ask your next level of support for assistance. **This ends the procedure.**

---

## Workstation adapter console isolation procedure

Contains the procedure necessary to isolate a failure that is detected by the workstation adapter console.

Use this procedure when no display is available with which to perform online problem analysis.

**Note:** If you are using a PC, you must install an emulation program.

Read all safety procedures before servicing the system. Observe all safety procedures when performing a procedure. Unless instructed otherwise, always power off the system or expansion tower where the FRU is located, see Powering on and powering off the system before removing, exchanging, or installing a field-replaceable unit (FRU).

## DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

Read and understand the following service procedures before using this section:

- Powering on and powering off the system
- Primary consoles or alternative consoles
- System FRU locations

**Note:** If the console has a keyboard error, there may be a K on the display. See the workstation service information for more information.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions.
2. Ensure that your workstation meets the following conditions:
  - The workstation that you are using for the console is powered on.
  - The emulation program is installed and is working.
  - The input/output adapter (IOA) is installed and the workstation console cable is attached.

**Notes:**

- a. Card information: Hardware that is associated with 6A59 feature is the type 2745 card.
- b. Cable information: The cable attaches directly to the IOA.

Did you find a problem with any of the conditions listed above?

**No:** Continue with the next step.

**Yes:** Correct the problem. Then, perform an IPL of the system. **This ends the procedure.**

3. Perform the following to make dedicated service tool (DST) available:

- a. If there is an alternative console, ensure that it is powered on.
- b. Ensure that **Manual** mode on the control panel is selected.
- c. Select function 21, **Make DST Available** on the control panel, and press **Enter**.

Does a display appear on either the console or any alternative console?

**No:** Continue with the next step.

**Yes:** Complete the IPL. When the operating system display appears, use the Work with Problem command (WRKPRB) or Analyze Problem command (ANZPRB) to analyze and correct or report any console problems. **This ends the procedure.**

4. Do you have SRC A600 5001, A600 5004, A600 5007, or B075 xxxx (where xxxx is any value)?

- **No:** Continue with the next step.
- **Yes:** Perform the following:
  - a. Disconnect any cables that are attached to the IOA.
  - b. Install the wrap plug on the IOA. The 2745 wrap plug label is QQ.
  - c. Perform an IPL in Manual mode.

5. Does SRC 6A59 5007 occur?

- **No:** Continue with the next step.
- **Yes:** One of the following is causing the problem:
  - Workstation emulation program
  - Workstation
  - Workstation console cable

**This ends the procedure.**

6. Did SRC A600 5001, A600 5004, or 6A59 5008 occur?

**No:** This is a new problem. Use the new reference code to perform problem analysis for the problem, or ask your next level of support for assistance. **This ends the procedure.**

**Yes:** The Type 2745 workstation adapter is the failing item. **This ends the procedure.**

## Isolating problems on servers that run AIX or Linux

Use the procedures for AIX or Linux servers if there is not an HMC attached to the server. If the server is connected to an HMC, use the procedures that are available on the HMC to continue FRU isolation.

### MAP 0210: General problem resolution

Use this procedure to exchange the FRUs in the order of their failure probability.

- **Step 0210-1**

**Did the problem report provide a part number for the FRU you are about to replace?**

**NO** Go to Step 0210-2.

**YES** Go to Step 0210-3.

- **Step 0210-2**

Find the failing function codes in the System parts, and record the FRU part number and description of each FRU.

- **Step 0210-3**  
Obtain the replacement part.
- **Step 0210-4**  
Go to System FRU locations, and follow the procedures for the FRU you are servicing.

## Problems with loading and starting the operating system (AIX and Linux)

If the system is running partitions from partition standby (LPAR), the following procedure addresses the problem in which one partition will not boot AIX or Linux while other partitions boot successfully and run the operating system successfully.

It is the customer's responsibility to move devices between partitions. If a device must be moved to another partition to run standalone diagnostics, contact the customer or system administrator. If the optical drive must be moved to another partition, all SCSI devices connected to that SCSI adapter must be moved because moves are done at the slot level, not at the device level.

Depending on the boot device, a checkpoint may be displayed on the operator panel for an extended period of time while the boot image is retrieved from the device. This is particularly true for tape and network boot attempts. If booting from an optical drive or tape drive, watch for activity on the drive's LED indicator. A blinking LED indicates that the loading of either the boot image or additional information required by the operating system being booted is still in progress. If the checkpoint is displayed for an extended period of time and the drive LED is not indicating any activity, there might be a problem loading the boot image from the device.

### Notes:

1. For network boot attempts, if the system is not connected to an active network or if the target server is inaccessible (which can also result from incorrect IP parameters being supplied), the system will still attempt to boot. Because time-out durations are necessarily long to accommodate retries, the system may appear to be hung. Refer to checkpoint CA00 E174.
2. If the partition hangs with a 4-character checkpoint in the display, the partition must be deactivated, then reactivated before attempting to reboot.
3. If a BA06 000x error code is reported, the partition is already deactivated and in the error state. Reboot by activating the partition. If the reboot is still not successful, go to step 3.

This procedure assumes that a diagnostic CD-ROM and an optical drive from which it can be booted are available, or that diagnostics can be run from a NIM (Network Installation Management) server. Booting the diagnostic image from an optical drive or a NIM server is referred to as running standalone diagnostics.

1. Is a Hardware Management Console attached to the managed system?  
**Yes:** Continue with the next step.  
**No:** Go to step 3.
2. Look at the service action event error log in **Manage Serviceable Events** on the HMC. Perform the actions necessary to resolve any open entries that affect devices in the boot path of the partition or that indicate problems with I/O cabling. Then try to reboot the partition. Does the partition reboot successfully?  
**Yes: This ends the procedure.**  
**No:** Continue with the next step.
3. Boot to the SMS main menu:
  - If you are rebooting a partition from partition standby (LPAR), go to the properties of the partition and select **Boot to SMS**, then activate the partition.

- If you are rebooting from platform standby, access the ASMI. See Accessing the Advanced system Management Interface using a Web browser. Select **Power/Restart Control**, then **Power On/Off System**. In the AIX/Linux partition mode boot box, select **Boot to SMS menu** → **Save Settings and Power On**.

At the SMS main menu, select **Select Boot Options** and verify whether the intended boot device is correctly specified in the boot list. Is the intended load device correctly specified in the boot list?

- **Yes:** Perform the following:
    - a. Remove all removable media from devices in the boot list from which you do not want to load the operating system.
    - b. If you are attempting to load the operating system from a network, go to step 4.
    - c. If you are attempting to load the operating system from a disk drive or an optical drive, go to step 7.
    - d. **No:** Go to step 5.
4. If you are attempting to load the operating system from the network, perform the following:
- Verify that the IP parameters are correct.
  - Use the SMS ping utility to attempt to ping the target server. If the ping is not successful, have the network administrator verify the server configuration for this client.
  - Check with the network administrator to ensure that the network is up. Also ask the network administrator to verify the settings on the server from which you are trying to load the operating system.
  - Check the network cabling to the adapter.

Restart the partition and try loading the operating system. Does the operating system load successfully?

**Yes: This ends the procedure.**

**No:** Go to step 7.

5. Use the SMS menus to add the intended boot device to the boot sequence. Can you add the device to the boot sequence?
- Yes:** Restart the partition. **This ends the procedure.**
- No:** Continue with the next step.
6. Ask the customer or system administrator to verify that the device you are trying to load from is assigned to the correct partition. Then select **List All Devices** and record the list of bootable devices that displays. Is the device from which you want to load the operating system in the list?
- Yes:** Go to step 7.
- No:** Go to step 10 on page 296.
7. Try to load and run standalone diagnostics against the devices in the partition, particularly against the boot device from which you want to load the operating system. You can run standalone diagnostics from an optical drive or a NIM server. To boot standalone diagnostics, follow the detailed procedures in Running the AIX online and standalone diagnostics log .

**Note:** When attempting to load diagnostics on a partition from partition standby, the device from which you are loading standalone diagnostics must be made available to the partition that is not able to load the operating system, if it is not already in that partition. Contact the customer or system administrator if a device must be moved between partitions in order to load standalone diagnostics.

Did standalone diagnostics load and start successfully?

**Yes:** Go to step 8.

**No:** Go to step 14 on page 297.

8. Was the intended boot device present in the output of the option **Display Configuration and Resource List**, which is run from the Task Selection menu?

- **Yes:** Continue with the next step.
  - **No:** Go to step 10.
9. Did running diagnostics against the intended boot device result in a No Trouble Found message?
- Yes:** Go to step 12.
- No:** Go to the list of service request numbers and perform the repair actions for the SRN reported by the diagnostics. When you have completed the repair actions, go to step 13.
10. Perform the following actions:
- a. Perform the first item in the action list below. In the list of actions below, choose SCSI or IDE based on the type of device from which you are trying to boot the operating system.
  - b. Restart the system or partition.
  - c. Stop at the SMS menus and select **Select Boot Options**.
  - d. Is the device that was not appearing previously in the boot list now present?
    - Yes:** Go to Verify a repair. **This ends the procedure.**
    - No:** Perform the next item in the action list and then return to step 10b. If there are no more items in the action list, go to step 11.

**Action list:**

**Note:** See System FRU locations for part numbers and links to exchange procedures.

- a. Verify that the SCSI or IDE cables are properly connected. Also verify that the device configuration and address jumpers are set correctly.
  - b. Do one of the following:
    - **SCSI boot device:** If you are attempting to boot from a SCSI device, remove all hot-swap disk drives (except the intended boot device, if the boot device is a hot-swap drive). If the boot device is present in the boot list after you boot the system to the SMS menus, add the hot-swap disk drives back in one at a time, until you isolate the failing device.
    - **IDE boot device:** If you are attempting to boot from an IDE device, disconnect all other internal SCSI or IDE devices. If the boot device is present in the boot list after you boot the system to the SMS menus, reconnect the internal SCSI or IDE devices one at a time, until you isolate the failing device or cable.
  - c. Replace the SCSI or IDE cables.
  - d. Replace the SCSI backplane (or IDE backplane, if present) to which the boot device is connected.
  - e. Replace the intended boot device.
  - f. Replace the system backplane.
11. Choose from the following:
- If the intended boot device is not listed, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 364. **This ends the procedure.**
  - If an SRN is reported by the diagnostics, go to the list of service request numbers and follow the action listed. **This ends the procedure.**
12. Have you disconnected any other devices?
- Yes:** Reinstall each device that you disconnected, one at a time. After you reinstall each device, reboot the system. Continue this procedure until you isolate the failing device. Replace the failing device, then go to step 13.
- No:** Perform an operating system-specific recovery process or reinstall the operating system. **This ends the procedure.**
13. Is the problem corrected?
- Yes:** Go to Verify a repair. **This ends the procedure.**

- No:** If replacing the indicated FRUs did not correct the problem, or if the previous steps did not address your situation, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 364. **This ends the procedure.**
14. Is a SCSI boot failure (where you cannot boot from a SCSI-attached device) also occurring?
    - **Yes:** Go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 364. **This ends the procedure.**
    - **No:** Continue to the next step.
  15. Perform the following actions to determine if another adapter is causing the problem:
    - a. Remove all adapters except the one to which the optical drive is attached and the one used for the console.
    - b. Reload the standalone diagnostics. Can you successfully reload the standalone diagnostics?
      - **Yes:** Perform the following:
        - 1) Reinstall the adapters that you removed (and attach devices as applicable) one at a time. After you reinstall each adapter, retry the boot operation until the problem reoccurs.
        - 2) Replace the adapter or device that caused the problem.
        - 3) Go to Verify a repair. **This ends the procedure.**
      - **No:** Continue with the next step.
  16. The graphics adapter (if installed), optical drive, IDE or SCSI cable, or system board is most likely defective. Does your system have a PCI graphics adapter installed?
 

**Yes:** Continue with the next step.

**No:** Go to step 18
  17. Perform the following to determine if the graphics adapter is causing the problem:
    - a. Remove the graphics adapter.
    - b. Attach a TTY terminal to the system port.
    - c. Try to reload standalone diagnostics. Do the standalone diagnostics load successfully?
 

**Yes:** Replace the graphics adapter. **This ends the procedure.**

**No:** Continue with the next step.
  18. Replace the following (if not already replaced), one at a time, until the problem is resolved:
    - a. Optical drive
    - b. IDE or SCSI cable that goes to the optical drive
    - c. System board that contains the integrated SCSI or IDE adapters.

If this resolves the problem, go to Verify a repair. If the problem still persists or if the previous descriptions did not address your particular situation, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 364.

**This ends the procedure.**

## Storage I/O card modes and jumpers

Select the compression or enhanced mode for setting the storage I/O card.

The 2748 and 2778 I/O cards can run in either compression mode or enhanced mode.

- **Compression Mode:** Compression mode should only be used when you want to run Integrated Hardware Disk Compression. In compression mode, the write cache size is 4 MB.
- **Enhanced Mode:** Enhanced mode has an enhanced write cache size. In enhanced mode, the write cache size for the 2748 I/O card is 26MB, and the maximum compressed write cache size for the 2778 I/O card is 104MB. Enhanced mode also provides support for Extended Adaptive Cache (by attachment of a read cache device) and Extended Adaptive Cache Simulator.

The following subtopics are included here:

- “Setting or changing the mode of an I/O card.”
- When an error regarding the mode of the storage I/O card appears, the error message indicates whether the jumper is missing or overridden.
  - If the error message is CPPEA20, the I/O card has overridden the mode set by the jumper. See “Mode jumper has been overridden” on page 299.
  - If the error message is CPPEA21, the I/O card has detected that the jumper is missing. See “Mode jumper is missing” on page 299.

### Setting or changing the mode of an I/O card

Provides detailed steps for setting or changing the mode of an I/O card.

#### How to set or change the mode of an I/O card:

The 2748 and 2778 I/O cards support two modes: compression and enhanced. The rear of the I/O card is marked with a **C**, indicating compression mode, and an **E**, indicating enhanced mode. Three pins on the rear of the I/O card determine the mode of the card, depending on which of the pins have a jumper placed on them.

The jumper may be moved at any time, but changes only take effect during a system IPL. Refer to the illustration below while changing the mode jumper.

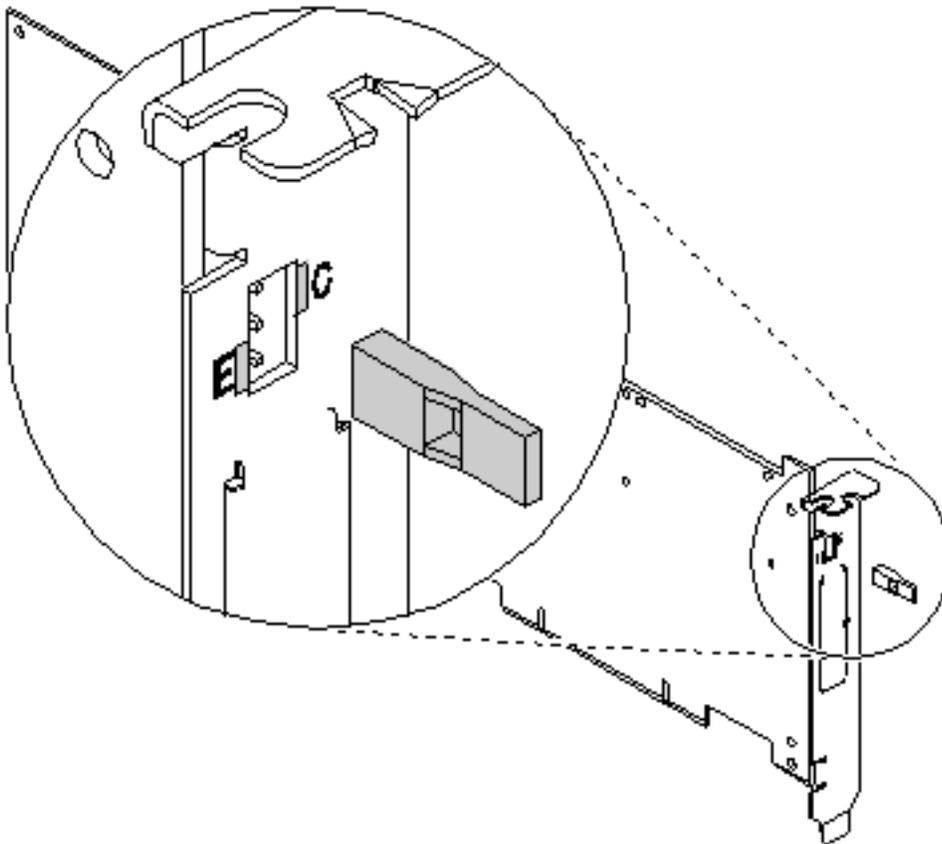


Figure 3. Changing the mode jumper

1. Power off the system, ensuring that no jobs are currently processing (see Powering on and powering off the system ).
2. Choose from the following options:
  - To set the mode of the card to compressed (C), place the jumper on the top and middle pins.

- To set the mode of the card to enhanced (E), place the jumper on the middle and bottom pins.
3. Select the IPL type and mode.
  4. Power on the system.

### Mode jumper has been overridden

Covers how to correct the error message that appears when the mode jumper has been overridden.

The error message CPPEA20 appears when the mode jumper has been overridden. This is due to cache data that is in a conflicting mode.

1. To begin correcting this error, examine the mode jumpers in the rear section of the storage I/O card.

**Note:** The mode jumper is accessible without requiring the removal of the I/O card.

2. Choose from the following options:

- If the mode jumper is not in the desired position, follow the steps in “Setting or changing the mode of an I/O card” on page 298.
- If the mode jumper is in the desired position and any other I/O card or device reference codes occurred at about the same time as this error, contact your service representative.
- If the mode jumper is in the desired position and no other I/O card or device reference codes occurred at about the same time as this error, then power the system down normally and IPL. See Powering on and powering off the system . **This ends the procedure.**

### Mode jumper is missing

The error message CPPEA21 appears when the mode jumper is missing from the storage I/O card.

1. Locate the jumper.
2. Power off the system. See Powering on and powering off the system .
3. Install the jumper in the correct position. See “Setting or changing the mode of an I/O card” on page 298.
4. Power on the system. **This ends the procedure.**

## SCSI service hints

Use one or more of the following procedures when servicing SCSI adapter or devices.

### General SCSI Configuration Checks

With any type of SCSI problem, begin with the following steps:

1. Verify that all SCSI devices on the SCSI bus have a unique address.
2. Verify that all cables are connected securely and that there is proper termination at both ends of the SCSI bus.
3. Verify that the cabling configuration does not exceed the maximum cable length for the adapter in use.
4. Verify that the adapters and devices that you are working with are at the appropriate microcode levels for the customer situation. If you need assistance with microcode issues, contact your service support structure.
5. If there are multiple SCSI adapters on the SCSI bus, verify that the customer is using the appropriate software (such as HACMP™ or HANFS) to support such an arrangement. If the correct software is not in use, some SCSI errors should be expected when multiple adapters attempt to access the same SCSI device. Also, each adapter should have a unique address.

### High Availability or Multiple SCSI System Checks

If you have a high-availability configuration, or if more than one system is attached to the same SCSI bus, do the following:

1. Verify that the adapters and devices have unique SCSI addresses. The default SCSI adapter address is always 7. If you have more than one adapter on the bus, change the address of at least one by using SMIT (**SMIT Devices** → **SCSI Adapter** → **Change/Show characteristics of an adapter**). You must make the changes to the database only, then reboot the system in order for the change to take effect.

**Note:** Diagnostics defaults to using ID 7 (it is recommended that this ID not be used in high availability configurations).

2. If RAID devices such as the 7135 or 7137 are attached, run the appropriate diagnostics for the device. If problems occur, contact your service support structure for assistance. If the diagnostics are run incorrectly on these devices, misleading SRNs can result.
3. Diagnostics cannot be run against OEM devices; doing so results in misleading SRNs.
4. Verify that all cables are connected securely and that both ends of the SCSI bus is terminated correctly.
5. Verify that the cabling configuration does not exceed the maximum cable length for the adapter in use. Refer to the SCSI Cabling section in the *RS/6000® eServer™ pSeries® Adapters, Devices, and Cable Information for Multiple Bus Systems* for more details on SCSI cabling issues.
6. Verify that the adapter and devices are at the appropriate microcode levels for the customer situation. If you need assistance with microcode issues, contact your service support structure.

## SCSI-2 Single-Ended Adapter PTC Failure Isolation Procedure

Before replacing a SCSI-2 single-ended adapter, use these procedures to determine if a short-circuit condition exists on the SCSI bus. The same positive temperature coefficient (PTC) resistor is used for both the internal and external buses. The PTC protects the SCSI bus from high currents due to short-circuiting on the cable, terminator, or device. It is unlikely that the PTC can be tripped by a defective adapter. Unless instructed to do so by these procedures, do not replace the adapter because of a tripped PTC resistor.

A fault (short-circuit) causes an increase in PTC resistance and temperature. The increase in resistance causes the PTC to halt current flow. The PTC returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off. Wait 5 minutes for the PTC resistor to fully cool, then retest.

These procedures determine if the PTC resistor is still tripped and then determine if there is a short-circuit somewhere on the SCSI bus.

### Determining Where to Start

Use the following to determine the adapter configuration and select the appropriate procedure:

- If there are external cables attached to the adapter, start with the External Bus PTC Isolation Procedure for your type of adapter.
- If there are no external cables attached, start with the “Internal SCSI-2 Single-Ended Bus PTC Isolation Procedure” on page 302.
- If there is a combination of external and internal cables start with the External Bus PTC Isolation Procedure for your type of adapter. If this procedure does not resolve the problem, continue with the Internal Bus PTC Isolation Procedure for your type of adapter.

### External SCSI-2 Single-Ended Bus PTC Isolation Procedure

Isolate the external SCSI bus PTC fault with the following procedure:

**Note:** The external bus is of single-ended design.

1. Ensure the system power and all externally attached device power is turned off. All testing is accomplished with the power off.

2. Disconnect any internal and external cables from the adapter and remove the adapter from the system.
3. Verify with a digital ohmmeter that the internal PTC resistor, labeled Z1, (refer to the illustration after Internal SCSI-2 Single-Ended Bus PTC Isolation Procedure, step 3 on page 302) is cool and in a low resistance state, typically less than 1/2 Ohm. Measuring across, be sure to probe both sides of the PTC where the solder joints and board come together. The polarity of the test leads is not important. If necessary, allow the PTC resistor to cool and measure again.
4. Locate Capacitor C1 and measure the resistance across it by using the following procedure:
  - a. Connect the positive lead to the side of the capacitor where the + is indicated on the board near C1. Be sure to probe at the solder joint where the capacitor and board come together.
  - b. Connect the negative lead to the opposite side of the capacitor marked "GND." Be sure to probe at the solder joint where the capacitor and board come together.
  - c. If there is no short-circuit present, then the resistance reading is high, typically hundreds of Ohms.

**Note:** Because this is a measurement across unpowered silicon devices, the reading is a function of the ohmmeter used.

- If there is a fault, the resistance reading is low, typically below 10 Ohms. Because there are no cables attached, the fault is on the adapter. Replace the adapter.

**Note:** Some multi-function meters label the leads specifically for voltage measurements. When using this type of meter to measure resistance, the plus lead and negative lead may not be labeled correctly. If you are not sure that your meter leads accurately reflect the polarity for measuring resistance, repeat this step with the leads reversed. If the short-circuit is not indicated with the leads reversed, the SCSI bus is not faulted (short-circuited).

- If the resistance measured was high, proceed to the next step.
5. Reattach the external cable to the adapter, then do the following:
    - a. Measure across C1 as previously described.
    - b. If the resistance is still high, in this case above 10 Ohms, then there is no apparent cause for a PTC failure from this bus. If there are internal cables attached, continue to the "Internal SCSI-2 Single-Ended Bus PTC Isolation Procedure" on page 302.
    - c. If the resistance is less than 10 Ohms, there is a possibility of a fault on the external SCSI bus. Troubleshoot the external SCSI bus by disconnecting devices and terminators. Measure across C1 to determine whether the fault has been removed. Replace the failing component. Go to Verify a repair.

## External SCSI-2 Single-Ended Bus Probable Tripped PTC Causes

The following list provides some suggestions of things to check when the PTC is tripped:

- A short-circuited terminator or cable. Check for bent pins on each connector and removable terminator.
- Intermittent PTC failures can be caused by improperly seated cable connectors. Reseat the connector and flex the cable in an attempt to duplicate the fault condition across C1.
- Plugging or unplugging a cable or terminator while the system is turned on (hot plugging).
- A short-circuited device.
- Differential devices or terminators are attached to the single-ended SCSI bus.

**Note:** The SCSI-2 Fast/Wide and Ultra PCI Adapters use an onboard electronic terminator on the external SCSI bus. When power is removed from the adapter, as in the case of this procedure, the terminator goes to a high impedance state and the resistance measured cannot be verified, other than it is high. Some external terminators use an electronic terminator, which also goes to a high impedance state when power is removed. Therefore, this procedure is designed to find a short-circuited or low resistance fault as opposed to the presence of a terminator or a missing terminator.

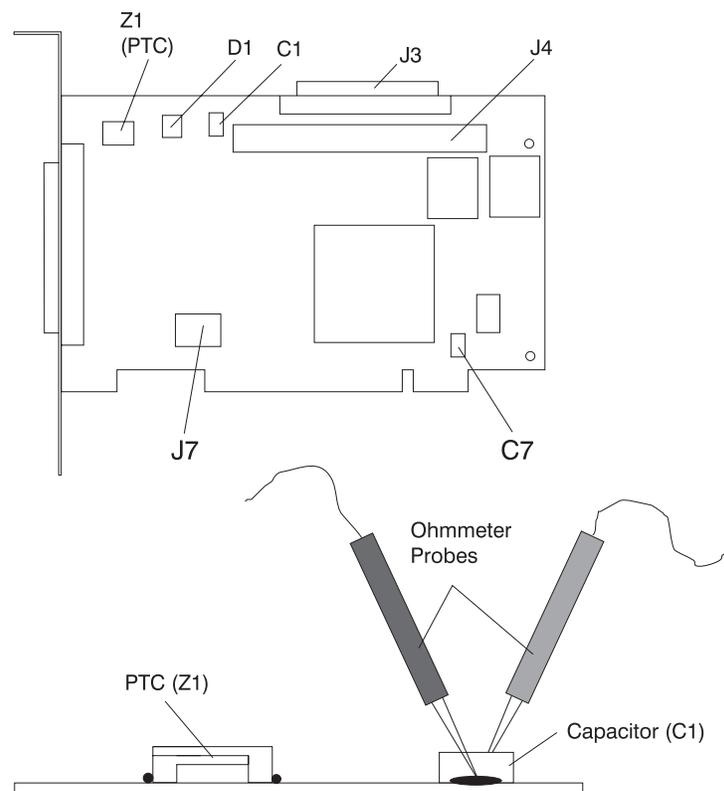
## Internal SCSI-2 Single-Ended Bus PTC Isolation Procedure

Isolate the internal SCSI bus PTC resistor fault with the following procedure:

**Note:** The internal bus is single-ended.

1. Ensure that system power and all externally attached device power is turned off.
2. Disconnect any internal and external cables from the adapter, then remove the adapter from the system.
3. Verify with a digital ohmmeter, that the internal PTC resistor, labeled Z1, is cool and in a low resistance state, typically less than 1/2 Ohm. Measuring across, be sure to probe both sides of the PTC where the solder joints and board come together. The polarity of the test leads is not important. If necessary, allow the PTC to cool and measure again. Refer to the following illustration.

SCSI-2 Fast/Wide PCI Single-Ended Adapter



**Note:** Ensure that only the probe tips are touching the solder joints. Do not allow the probes to touch any other part of the component.

4. Locate capacitor C1 and measure the resistance across it using the following procedure:
  - a. Connect the positive lead to the side of the capacitor where the + is indicated. Be sure to probe at the solder joint where the capacitor and board come together.
  - b. Connect the negative lead to the opposite side of the capacitor. Be sure to probe at the solder joint where the capacitor and board come together.
  - c. If there is no short-circuit present, the resistance reading is high, typically hundreds of Ohms.

**Note:** Because this is a measurement across unpowered silicon devices, the reading is a function of the ohmmeter used.

- If there is a fault, the resistance reading is low, typically below 10 Ohms. Because there are no cables attached, the fault is on the adapter. Replace the adapter.

**Note:** Some multi-function meters label the leads specifically for voltage measurements. When using this type of meter to measure resistance, the plus lead and negative lead may not be labeled correctly. If you are not sure that your meter leads accurately reflect the polarity for measuring resistance, repeat this step with the leads reversed. Polarity is important in this measurement to prevent forward-biasing diodes, which lead to a false low resistance reading. If the short circuit is not indicated with the leads reversed, the SCSI bus is not faulted (short-circuited).

- If the resistance is high and there is no internal cable to reattach, there is no apparent cause for the PTC resistor diagnostic failure.
  - If the resistance is high and there is an internal cable to reattach, proceed to the next step.
5. Reattach the internal cable to the adapter, then do the following:
- a. Measure across C1 as described previously.
  - b. If the resistance is still high, above 25 Ohms, there is no apparent cause for a PTC failure.
  - c. If the resistance is less than 10 Ohms, a fault on the internal SCSI bus is possible. Troubleshoot the internal SCSI bus by disconnecting devices and terminators. Measure across C1 to determine if the fault has been removed.

**Note:** Some internal cables have nonremovable terminators.

## Internal SCSI-2 Single-Ended Bus Probable Tripped PTC Resistor Causes

The following list provides some suggestions of things to check when the PTC is tripped:

- A short-circuited terminator or cable. Check for bent pins on each connector and removable terminator.
- Intermittent PTC failures can be caused by incorrectly seated cable connectors. Reseat the connector and flex the cable in an attempt to duplicate the fault condition across C1.
- A short-circuited device.
- On some systems, the terminator is fixed to the internal cable and cannot be removed. If all devices are removed from the cable and the resistance is still low, then the cable should be replaced.

**Note:** The SCSI-2 Fast/Wide and Ultra PCI adapters use an onboard electronic terminator on the internal SCSI bus. When power is removed from the adapter, as in the case of this procedure, the terminator goes to a high impedance state and the resistance measured cannot be verified, other than it is high. Some internal terminators use an electronic terminator, which also goes to a high impedance state when power is removed. Therefore, this procedure is designed to find a short-circuit or low resistance fault as opposed to the presence of a terminator or a missing terminator.

## SCSI-2 Differential Adapter PTC Failure Isolation Procedure

Use this procedure when SRN *xxx-240* or *xxx-800* has been indicated.

The differential adapter can be identified by the 4-B or 4-L on the external bracket plate.

Before replacing a SCSI-2 differential adapter, use these procedures to determine if a short-circuit condition exists on the SCSI Bus. The PTC protects the SCSI bus from high currents due to short-circuits on the cable, terminator, or device. It is unlikely that the PTC can be tripped by a defective adapter. Unless instructed to do so by these procedures, do not replace the adapter because of a tripped PTC resistor.

A fault (short-circuit) causes an increase in PTC resistance and temperature. The increase in resistance causes the PTC to halt current flow. The PTC returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off. Wait 5 minutes for the PTC resistor to fully cool, then retest.

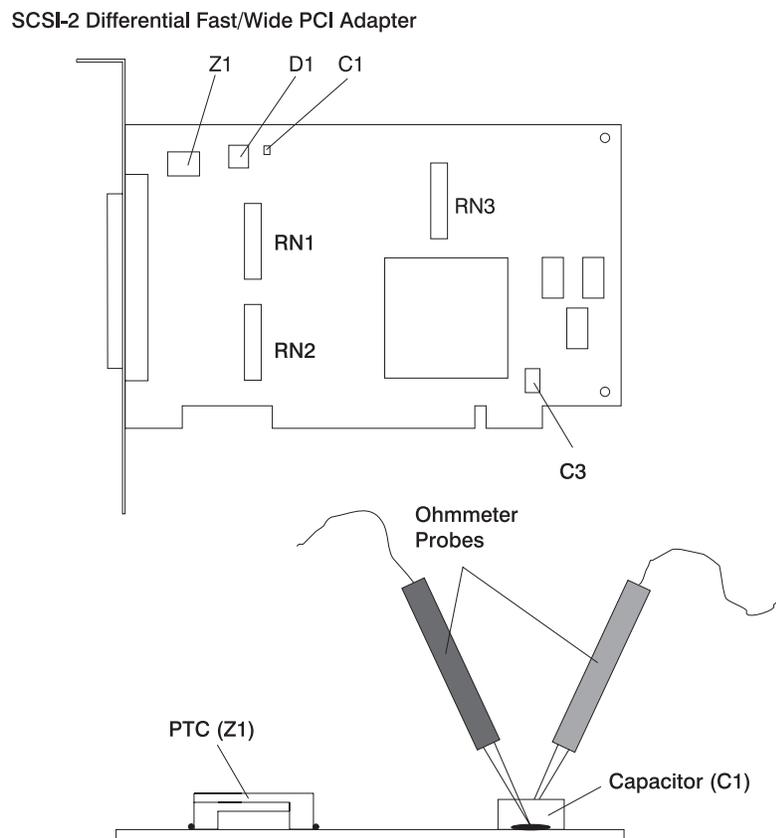
These procedures determine if the PTC resistor is still tripped and then determine if there is a short-circuit somewhere on the SCSI bus.

## External SCSI-2 Differential Adapter Bus PTC Isolation Procedure

Isolate the external SCSI bus PTC fault with the following procedure:

### Notes:

1. Ensure that only the probe tips are touching the solder joints. Do not allow the probes to touch any other part of the component.
2. The external bus is differential.
  1. Ensure that system power and all externally attached device power is turned off.
  2. Check to ensure all devices are marked SCSI Differential and that the terminator on the end of the SCSI bus is also marked differential. If not, you may have a single-ended SCSI device or terminator on the differential SCSI bus. Single-ended devices do not work on a differential SCSI bus and may cause a PTC type error to be reported. The entire SCSI bus may appear to be intermittent. After ensuring the system is completely differential, continue.
3. Disconnect the external cables from the adapter and remove the adapter from the system.
4. Verify with a digital ohmmeter that the internal PTC resistor, labeled Z1, is cool and in a low resistance state, typically less than 1/2 Ohm. Refer to the following illustration. Measuring across, be sure to probe both sides of the PTC resistor where the solder joints and board come together. The polarity of the test leads is not important. If necessary, allow the PTC resistor to cool and measure again.



5. Locate capacitor C1 and measure the resistance across it using the following procedure:
  - a. Connect the negative lead to the side of the capacitor marked "GND". Be sure to probe at the solder joint where the capacitor and board come together.
  - b. Connect the positive lead to the side of the capacitor marked "Cathode D1" on the board near C1. Be sure to probe at the solder joint where the capacitor and board come together.

- If there is no fault present, then the resistance reading is 25 to 35 Ohms. The adapter is not faulty. Continue to the next step.
  - If the resistance measured is higher than 35 Ohms, check to see if RN1, RN2, and RN3 are plugged into their sockets. If these sockets are empty, you are working with a Multi-Initiators or High-Availability system. With these sockets empty, a resistive reading across C1 cannot be verified other than it measures a high resistance (not a short-circuit). If the resistance measurement is not low enough to be suspected as a fault (lower than 10 Ohms), continue to the next step.
  - If the resistance is high and there is no external cable to reattach, there is no apparent cause for the PTC diagnostic failure.
  - If the resistance reading is low, typically below 10 Ohms, there is a fault. Because there are no cables attached, the fault is on the adapter. Replace the adapter.
  - If the resistance measured was high and there is an external cable to reattach, proceed to the next step.
6. Reattach the external cable to the adapter.
    - a. Measure across C1 as previously described.
    - b. If the resistance is between 10 to 20 Ohms, there is no apparent cause for a PTC resistor failure.
    - c. If the resistance is less than 10 Ohms, there is a possibility of a fault on the external SCSI bus. Troubleshoot the external SCSI bus by disconnecting devices and terminators. Measure across C1 to determine if the fault has been removed.

## SCSI-2 Differential Adapter Probable Tripped PTC Causes

The following list provides some suggestions of things to check when the PTC is tripped:

- A short-circuited terminator or cable. Check for bent pins on each connector and removable terminator.
- Intermittent PTC failures can be caused by incorrectly seated cable connectors. Reseat the connector and flex the cable in an attempt to duplicate the fault condition across C1.
- Plugging or unplugging a cable or terminator while the system is turned on (hot-plugging).
- A short-circuited device.
- Single-ended devices are attached to the differential SCSI bus.

## Dual-Channel Ultra SCSI Adapter PTC Failure Isolation Procedure

Use the following procedures if diagnostics testing indicates a potential positive temperature coefficient (PTC) resistor fault or the TERMPWR short-circuited LED is lit.

This procedure is used for SRNs 637-240 and 637-800 on the Dual-Channel Ultra SCSI Adapter. If the TERMPWR short-circuited LED is lit, use this procedure to help isolate the source of the problem on the failing channel.

1. Identify the adapter by its label of 4-R on the external bracket. Then, determine if the failure is on channel A or channel B.
2. The same PTC is used for both the internal and external buses. The PTC protects the SCSI bus from high currents due to short-circuits on the cable, terminator, or device. It is unlikely that the PTC can be tripped by a defective adapter. A fault (short-circuit) causes an increase in PTC resistance and temperature. The increase in resistance causes the PTC to halt current flow. The PTC returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off.  
Wait 5 minutes for the PTC resistor to fully cool, then retest.
3. If this same error persists, or the TERMPWR short-circuited LED is lit, replace the components of the failing channel in the following order (wait five minutes between steps):
  - a. If the failure is on the external cable, replace the following:
    - 1) Cable

- 2) Device
  - 3) Attached subsystem
  - 4) Adapter
- b. If the failure is on the internal cable, replace the following:
- 1) Cable
  - 2) Device
  - 3) Backplane
  - 4) Adapter
- c. If the failure persists, verify that the parts exchanged are in the correct channel (internal or external, A or B).
- If the errors are still occurring, continue isolating the problem by going to “MAP 0050: SCSI bus problems” on page 320.

### 64-bit PCI-X Dual Channel SCSI Adapter PTC Failure Isolation Procedure

Use the following procedures if diagnostics testing indicates a potential self-resetting thermal fuse problem. This procedure is used for SRN 2524-702 on the integrated dual-channel SCSI adapter in a 7039/651 system.

1. Identify the adapter as the one embedded in the system board. Then, determine if the failure is on channel 0 or channel 1.
2. The thermal fuse protects the SCSI bus from high currents due to short-circuits on the terminator, cable, or device. It is unlikely that the thermal fuse can be tripped by a defective adapter. A fault (short-circuit) causes an increase in resistance and temperature of the thermal fuse. The increase in temperature causes the thermal fuse to halt current flow. The thermal fuse returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off.  
Wait 10 seconds for the thermal fuse to reset itself and recover, then retest.
3. If the same error persists, replace the components of the failing channel in the following order. Wait 10 seconds for the thermal fuse to reset itself between steps.
  - a. Cable
  - b. Device
  - c. DASD backplane (if present)
  - d. System board (adapter)
4. If the failure persists, verify that the parts exchanged are in the correct channel (0 or 1). If the errors are still occurring, continue isolating the problem by going to “MAP 0050: SCSI bus problems” on page 320.

### MAP 0220: Hot-Swap FRU problem resolution

Use this procedure to exchange hot-swappable field replaceable units (FRUs).

**Note:** The FRU you want to hot plug might have a defect on it that can cause the hot-plug operation to fail. If, after following the hot-plug procedure, you continue to get an error message that indicates that the hot-plug operation has failed, schedule a time for deferred maintenance when the system containing the FRU can be powered off. Then go to MAP 0210: General problem resolution, Step 0210-2 and answer NO to the question **Do you want to exchange this FRU as a hot-plug FRU?**

**Attention:** If the FRU is a disk drive or an adapter, ask the system administrator to perform the steps necessary to prepare the device for removal.

#### • Step 0220-1

1. If the system displayed a FRU part number on the screen, use that part number to exchange the FRU.

If there is no FRU part number displayed on the screen, refer to the SRN listing. Record the SRN source code and the failing function codes in the order listed.

2. Find the failing function codes in the FFC listing, and record the FRU part number and description of each FRU.
3. To determine if the part is hot-swappable, refer to the System FRU locations procedure for the part.

**Does this system unit support hot-swapping of the first FRU listed?**

**NO** Go to “MAP 0210: General problem resolution” on page 293.

**YES** Go to Step 0220-2.

• **Step 0220-2**

**Is the FRU a hot-swap power supply or fan?**

**NO** Go to Step 0220-4.

**YES** Go to Step 0220-3.

• **Step 0220-3**

**Note:** Refer to System FRU locations for the part.

1. Remove the old FRU.
2. Install the new FRU.
3. Enter the **diag** command.

Go to Step 0220-14.

• **Step 0220-4**

**Is the FRU a hot-plug PCI adapter?**

**NO** Go to Step 0220-5.

**YES** Go to Step 0220-12.

• **Step 0220-5**

**Is the FRU a SCSI hot-plug device?**

**NO** Go to Step 0220-11.

**YES** Go to Step 0220-6.

• **Step 0220-6**

**Is the hot-plug drive located within a system unit?**

**NO** Go to Step 0220-8.

**YES** Go to Step 0220-7.

• **Step 0220-7**

Refer to the removal and replacement procedures for your system in System FRU locations .

Go to Step 0220-13.

• **Step 0220-8**

**Does the hot-plug drive’s enclosure have procedures for removing and replacing SCSI disk drives?**

**NO** Go to Step 0220-9.

**YES** If a hot-plug procedure exists, use that procedure to remove the old hot-plug SCSI disk drive and replace it with a new hot-plug SCSI disk drive. Otherwise, if no hot-plug procedure exists, use the power off procedure to remove the old SCSI disk drive and replace it with a new SCSI disk drive. Go to Step 0220-13.

• **Step 0220-9**

1. Ask the customer to back up the data on the drive that you intend to replace onto another drive.

2. Verify that the disk drive is in the defined state. The amber LED on the hot-plug disk drive should be off.

**Is the hot-plug disk drive's amber LED unlit?**

**NO** Ask the customer to remove the hot-plug disk drive from the operating system configuration (refer the customer to the system management guide for more information).

**YES** Go to Step 0220-10.

- **Step 0220-10**

Using the hot-plug task service aid, replace the hot-plug drive using the following procedure:

1. Use the option **List the SES Devices** to show the configuration of the hot-plug slots. Identify the slot number of the adapter for the FRU you want to replace.
2. Select the option **REPLACE/REMOVE a Device Attached to an SES Device**.
3. Select the slot which contains the SCSI hot-plug drive you want to replace. Press Enter. You will see a fast blinking green light on the front on the hot-plug drive indicating that it is ready for removal.

**Note:** Refer to the "Installing hardware" section of the information; locate the server information that you are servicing and follow the tables to locate the correct removal or replacement procedure.

4. Remove the old hot-plug drive.
5. Install the new hot-plug drive. After the hot-plug drive is in place, press Enter.
6. Press Exit. Wait while configuration is done on the drive, until you see the "hot-plug task" on the service aid menu.

Go to Step 0220-15.

- **Step 0220-11**

**Attention:** Do not remove functioning disks in a disk array attached to a PCI-X SCSI RAID controller without assistance from your service support structure. A disk array may become degraded or failed if functioning disks are removed and additional problems may be created. If you still need to remove a RAID array disk attached to a PCI-X SCSI RAID controller, use the SCSI and SCSI RAID hot-plug manager.

Using the hot-plug task service aid, replace the hot-plug drive using the hot plug RAID service aid:

**Note:** The drive you want to replace must be either a SPARE or FAILED drive. Otherwise, the drive would not be listed as an "Identify and remove resources selection" within the RAID HOT-PLUG DEVICES screen. In that case you must ask the customer to put the drive into FAILED state. Refer the customer to the *Operating System and Device management* in the AIX library for more information. Ask the customer to back up the data on the drive that you intend to replace.

1. Select the option **RAID HOT-PLUG DEVICES** within the **HOT-PLUG TASK** under **DIAGNOSTIC SERVICE AIDS**.
2. Select the RAID adapter that is connected to the RAID array containing the RAID drive you want to remove, then select **COMMIT**.
3. Choose the option **IDENTIFY** in the IDENTIFY AND REMOVE RESOURCES menu.
4. Select the physical disk which you want to remove from the RAID array and press Enter.
5. The disk will go into the **IDENTIFY** state, indicated by a flashing light on the drive. Verify that it is the physical drive you want to remove, then press Enter.
6. At the IDENTIFY AND REMOVE RESOURCES menu, choose the option **REMOVE** and press Enter.
7. A list of the physical disks in the system that may be removed will be displayed. If the physical disk you want to remove is listed, select it and press Enter. The physical disk will go into the REMOVE state, as indicated by the LED on the drive. If the physical disk you want to remove is not listed, it is not a SPARE or FAILED drive. Ask the customer to put the drive in the FAILED state before you can proceed to remove it. Refer the customer to the *Operating System and Device management* in the AIX library for more information.

8. Refer to the service guide for the system unit or enclosure that contains the physical drive for removal and replacement procedures for the following substeps:
  - a. Remove the old hot-plug RAID drive.
  - b. Install the new hot-plug RAID drive. After the hot-plug drive is in place, press Enter. The drive will exit the REMOVE state, and will go to the NORMAL state after you exit diagnostics.

**Note:** There are no elective tests to run on a RAID drive itself under diagnostics (the drives are tested by the RAID adapter).

9. This completes the repair. Return the system to the customer. Ask the customer to add the physical disk drive to the original configuration within the RAID. Refer them to system management guide for more information.

• **Step 0220-12**

1. Remove the old adapter FRU and replace it with the new adapter FRU. Refer to the System FRU locations procedure for the part.
2. Enter the diag command.
3. Go to the FUNCTION SELECTION menu, and select the option **Advanced Diagnostics Routines**.
4. When the DIAGNOSTIC MODE SELECTION menu displays, select the option **System Verification**.
5. Go to Step 0220-14.

• **Step 0220-13**

1. If not already running diagnostics, enter the diag command.

**Note:** If you are already running service mode diagnostics and have just performed the task **Configure Added/Replaced Devices** (under the SCSI Hot Swap manager of the Hot Plug Task service aid), you must use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS menu before proceeding with the next step, or else the drive might not appear on the resource list.

2. Go to the FUNCTION SELECTION menu, and select the option **Advanced Diagnostics Routines**.
3. When the DIAGNOSTIC MODE SELECTION menu displays, select the option **System Verification**.

**Does the hot-plug SCSI disk drive you just replaced appear on the resource list?**

**NO** Verify that you have correctly followed the procedures for replacing hot-plug SCSI disk drives in the system service guide. If the disk drive still does not appear in the resource list, go to "MAP 0210: General problem resolution" on page 293 to replace the resource that the hot-plug SCSI disk drive is plugged into.

**YES** Go to Step 0220-14.

• **Step 0220-14**

Run the diagnostic test on the FRU you just replaced.

**Did the diagnostics run with no trouble found?**

**NO** Go to Step 0220-15.

**YES** Go to Verify a repair. Before returning the system to the customer, if a hot-plug disk has been removed, ask the customer to add the hot-plug disk drive to the operating system configuration. Refer to *Operating System and Device Management* in the AIX library for more information.

• **Step 0220-15**

1. Use the option **Log Repair Action** in the TASK SELECTION menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with your repair action. If it is not displayed on the resource list, select **sysplanar0**.

**Note:** On systems with a fault indicator LED, this changes the fault indicator LED from the fault state to the normal state.

2. While in diagnostics, go to the FUNCTION SELECTION menu. Select the option **Advanced Diagnostics Routines**.
3. When the DIAGNOSTIC MODE SELECTION menu displays, select the option **System Verification**. Run the diagnostic test on the FRU you just replaced, or **sysplanar0**.

**Did the diagnostics run with no trouble found?**

**NO** Go to Step 0220-16.

**YES** If you changed the service processor or network settings, restore the settings to the value they had prior to servicing the system. If you performed service on a PCI RAID subsystem involving changing of the RAID adapter cache card or changing the configuration on RAID disks, ask the customer to run "PCI SCSI disk array manager" using smitty to resolve the PCI SCSI RAID adapter configuration. The following is an example of how the customer would resolve the configuration:

1. At the AIX command line, type `smitty pdam`.
2. On the PCI SCSI Disk Array Manager screen, select **RECOVERY OPTIONS**.
3. If a previous configuration exists on the replacement adapter, this must be cleared. Select **Clear PCI SCSI RAID Adapter Configuration**. Press F3.
4. On the Recovery Options screen, select **RESOLVE PCI SCSI RAID ADAPTER CONFIGURATION**.
5. On the Resolve PCI SCSI RAID Adapter Configuration screen, select **ACCEPT CONFIGURATION on DRIVES**.
6. On the PCI SCSI RAID Adapter selection menu, select the adapter that you changed.
7. On the next screen, press Enter.
8. On the "Are You Sure?" selection menu, press Enter to continue.
9. You receive an OK status message when the recovery is complete. If you get a Failed status message, verify that you are performing recovery on the correct adapter, then do this complete procedure. When you complete the recovery, exit smitty to return to the AIX command line.

Go to Verify a repair.

- **Step 0220-16**

**Does the original problem persist?**

**NO** If a FRU was replaced, run the log repair action service aid under the online diagnostics for the resource that was replaced. If the resource associated with your action is not displayed on the resource list, select **sysplanar0**. If steps were taken to make the device ready for removal, inform the system administrator of the steps required to return the system to the original state. Go to Verify a repair.

**YES** Go to Step 0220-17.

- **Step 0220-17**

**Have you exchanged all the FRUs that correspond to the failing function codes?**

**NO** Go to Step 0220-18.

**YES** The SRN did not identify the failing FRU. Schedule a time to run diagnostics in service mode. If the same SRN is reported in service mode, go to "MAP 0030: Additional problem determination" on page 317.

- **Step 0220-18**

**Note:** Before proceeding, remove the FRU you just replaced and install the original FRU in its place.

**Does the system unit support hot-swapping of the next FRU listed?**

**NO** Go to "MAP 0210: General problem resolution" on page 293.

- YES** The SRN did not identify the failing FRU. Schedule a time to run diagnostics in service mode. If the same SRN is reported in service mode, go to Step 0220-14.

## MAP 0020: Problem determination procedure

Use this MAP to get a service request number (SRN) if the customer or a previous MAP provided none.

### Purpose of this MAP

Use this MAP to get a service request number (SRN) if the customer or a previous MAP provided none. If you are unable to power the system on, refer to the "Power isolation procedures" on page 137.

- **Step 0020-1**

Visually check the server for obvious problems such as unplugged power cables or external devices that are powered off.

**Did you find an obvious problem?**

**NO** Go to Step 0020-2.

**YES** Fix the problem, then go to Verify a repair.

- **Step 0020-2**

**Are the AIX online diagnostics installed?**

**Note:** If AIX is not installed on the server or partition, answer no to the above question.

**NO** If the operating system is running, perform its shutdown procedure. Get help if needed. Go to Step 0020-4.

**YES** Go to Step 0020-3.

- **Step 0020-3**

**Note:** When possible, run online diagnostics in service mode. Online diagnostics perform additional functions compared to standalone diagnostics.

Run online diagnostics in concurrent mode when the customer does not let you power-off the system unit. To run online diagnostics in service mode, go to substep 5. If the system unit is already running in the service mode and you want to run online diagnostics, proceed to the question at the bottom of this MAP step. Otherwise, continue with 1 through 4 in the following procedure.

1. Log in with root authority or use CE login. If necessary, ask the customer for the password.
2. Enter the **diag -a** command to check for missing resources.
  - a. If you see a command line prompt, proceed to substep 3 below.
  - b. If the DIAGNOSTIC SELECTION menu is displayed, with the letter M shown next to any resource, select that resource, then press Commit (F7 key). Follow any instructions displayed. If you are prompted with a message Do you want to review the previously displayed error select **Yes** and press Enter. If an SRN displays, record it, and go to Step 0020-15. If there is no SRN, go to substep 3 below.
  - c. If the MISSING RESOURCE menu is displayed, follow any instructions displayed. If you are prompted with a message Do you want to review the previously displayed error select **Yes** and press Enter. If an SRN displays, record it, and go to Step 0020-15. If there is no SRN, go to substep 3 below.
3. Enter the **diag** command.
4. Go to Step 0020-5.
5. If the operating system is running, perform its shutdown procedure (get help if needed).
6. Turn off the system unit power and wait 45 seconds before proceeding.
7. Turn on the system unit power.
8. Load the online diagnostics in service mode.

9. Wait until the Diagnostic Operating Instructions display or the system appears to have stopped.

**Are the Diagnostic Operating Instructions displayed?**

**NO** Go to Step 0020-16.

**YES** Go to Step 0020-5.

• **Step 0020-4**

**Note:** If you are working on a partition, do not remove the power as directed in the following procedure. Remove the power only if you are working on a server that does not have multiple partitions.

1. If the server does not have multiple partitions, disconnect the power from the server, wait 45 seconds, then reconnect the power.
2. If the server supports slow boot. See Performing a slow boot. Set the server to perform a slow boot for the next boot that is performed. If the system does not support slow boot, do a normal boot in the next step.
3. Refer to Running the standalone diagnostics from CD-ROM to load the standalone diagnostics. Before continuing to the next step, ensure that the server power is turned on, or if you are working on a partition, the partition is started. The server or partition should be booting the standalone diagnostics from a CD-ROM or a network server.
4. Wait until the Diagnostic Operating Instructions display or the server boot appears to have stopped.

**Are the Diagnostic Operating Instructions displayed?**

**NO** Go to Step 0020-16.

**YES** Go to Step 0020-5.

• **Step 0020-5**

**Are the Diagnostic Operating Instructions displayed (screen number 801001) with no obvious problem (for example, blurred or distorted)?**

**NO** For display problems, go to Step 0020-12.

**YES** To continue with diagnostics, go to Step 0020-6.

• **Step 0020-6**

Press the Enter key.

**Is the FUNCTION SELECTION menu displayed (screen number 801002)?**

**NO** Go to Step 0020-13.

**YES** Go to Step 0020-7.

• **Step 0020-7**

1. Select the option **ADVANCED DIAGNOSTICS ROUTINES**.

**Notes:**

- a. If the terminal type is not defined, do so now. You cannot proceed until this is complete.
  - b. If you have SRNs from a Previous Diagnostics Results screen, process these Previous Diagnostics Results SRNs prior to processing any SRNs you may have received from an SRN reporting screen.
2. If the **DIAGNOSTIC MODE SELECTION** menu (screen number 801003) displays, select the option **PROBLEM DETERMINATION**.
  3. Find your system response in the following table. Follow the instructions in the Action column.

System Response	Action
Previous Diagnostic Results. Do you want to review the previously displayed error?	<p>You have a pending item in the error log for which there is no corresponding Log Repair Action. To see this error, select <b>YES</b> at the prompt.</p> <p>Information from the error log is displayed in order of last event first. Record the error code, the FRU names and the location code of the FRUs.</p> <p>Go to Step 0020-15.</p>
The RESOURCE SELECTION menu or the ADVANCED DIAGNOSTIC SELECTION menu is displayed (screen number 801006).	Go to Step 0020-8.
The system halted while testing a resource.	Record SRN 110-xxxx, where xxxx is the first four digits of the menu number displayed in the upper-right corner of the diagnostic menu. Go to Step 0020-15.
The MISSING RESOURCE menu is displayed or the letter M is displayed alongside a resource in the resource list.	<p>If the MISSING RESOURCE menu is displayed, follow the displayed instructions until either the ADVANCED DIAGNOSTIC SELECTION menu or an SRN is displayed. If an M is displayed in front of a resource (indicating that it is missing) select that resource then choose the Commit (F7 key).</p> <p><b>Note:</b></p> <ol style="list-style-type: none"> <li>1. Run any supplemental media that may have been supplied with the adapter or device, and then return to substep 1 of Step 0020-7.</li> <li>2. If the SCSI enclosure services device appears on the missing resource list along with the other resources, select it first.</li> <li>3. ISA adapters cannot be detected by the system. The ISA adapter configuration service aid in standalone diagnostics allows the identification and configuration of ISA adapters.</li> </ol> <p>If the ADVANCED DIAGNOSTIC SELECTION menu is displayed, go to Step 0020-11.</p> <p>If an 8-digit error code is displayed, record it and go to Start of Call.</p> <p>If an SRN is displayed, record it, and go to Step 0020-15.</p>
The message The system will now continue the boot process is displayed continuously on the system unit's console.	Go to Step 0020-4.
The message Processing supplemental diagnostic diskette media is displayed continuously on the system unit's console.	Call your service support.
<p>The diagnostics begin testing a resource.</p> <p><b>Note:</b> If the option <b>Problem Determination</b> was selected from the DIAGNOSTIC MODE SELECTION menu, and if a recent error has been logged in the error log, the diagnostics automatically begin testing the resource.</p>	<p>Follow the displayed instructions.</p> <p>If the No Trouble Found screen is displayed, press Enter.</p> <p>If another resource is tested, repeat this step.</p> <p>If the ADVANCED DIAGNOSTIC SELECTION menu is displayed, go to Step 0020-11.</p> <p>If an SRN is displayed, record it, and go to Step 0020-15.</p> <p>If an 8-digit error code is displayed, go to Start of Call.</p>
The system did not respond to selecting the advanced diagnostics option.	Go to Step 0020-13.

System Response	Action
A system unit with a beeper did not beep while booting.	Record SRN 111-947 and then go to Step 0020-15
The system unit emits a continuous sound from the beeper.	Record SRN 111-947 and then go to Step 0020-15.
An SRN or an eight-digit error code is displayed.	Record the error code, the FRU names, and the location code for the FRUs. If a SRN is displayed, go to Step 0020-15.  If an 8-digit error code is displayed, go to Start of Call.
The system stopped with a 3-digit or 4-digit code displayed in the operator panel display.	Record SRN 101-xxx (where xxx is the rightmost three digits of the displayed code). Go to Step 0020-15.
An 888 message is displayed in the operator panel display. <b>Note:</b> The 888 may or may not be flashing.	Go to "MAP 0070: 888 sequence in operator panel display" on page 329.

- **Step 0020-8**

On the DIAGNOSTIC SELECTION or ADVANCED DIAGNOSTIC SELECTION menu, look through the list of resources to make sure that all adapters and SCSI devices are listed including any new resources.

**Notes:**

1. Resources attached to serial and parallel ports may not appear in the resource list.
2. If running diagnostics in a partition within a partitioned system, resources assigned to other partitions will not be displayed on the resource list.

**Did you find all the adapters or devices on the list?**

**NO** Go to Step 0020-9.

**YES** Go to Step 0020-11.

- **Step 0020-9**

**Is the new device or adapter an exact replacement for a previous one installed at same location?**

**NO** Go to Step 0020-10.

**YES** The replacement device or adapter may be defective. If possible, try installing it in an alternate location if one is available; if it works in that location, then suspect that the location where it failed to appear has a defective slot. Schedule time to replace the hardware that supports that slot. If it does not work in alternate location, suspect a bad replacement adapter or device. If you are still unable to detect the device or adapter, contact your service support structure.

- **Step 0020-10**

**Is the operating system software to support this new adapter or device installed?**

**NO** Load the operating system software.

**YES** The replacement device or adapter may be defective. If possible, try installing it in an alternate location if one is available; if it works in that location, then suspect that the location where it failed to appear has a defective slot. Schedule time to replace the hardware that supports that slot. If it does not work in alternate location, suspect a bad replacement adapter or device. If you are still unable to detect the device or adapter, contact your service support structure.

- **Step 0020-11**

Select and run the diagnostic test problem determination or system verification on one of the following:

- The resources with which the customer is having problems. If the resource is not shown on the DIAGNOSTIC SELECTION menu, then run diagnostics on its parent (the adapter or controller to which the resource is attached).
- The resources you suspect are causing a problem.
- All resources.

**Note:** When choosing **All Resources**, interactive tests are not done. If no problem is found running **All Resources**, select each of the individual resources on the selection menu to run diagnostics tests on to do the interactive tests

Find the response in the following table, or follow the directions on the test results screen.

Diagnostic Response	Action
An SRN or an eight-digit error code is displayed on the screen.	Record the error code, the FRU names, and the location code for the FRUs. If an SRN is displayed, go to Step 0020-15. If an 8-digit error code is displayed, go to the information center, and perform a search on the error code to obtain the name and location of the failing FRU. Perform the listed action.
The TESTING COMPLETE menu and the No trouble was found message are displayed, and you have not tested all of the resources.	Press Enter and continue testing other resources.
The TESTING COMPLETE menu and the No trouble was found message are displayed, and you have tested all of the resources.	Go to Step 0020-14. <b>Note:</b> If you have not run the <b>sysplanar</b> test, do so before going to Step 0020-14.
The system halted while testing a resource.	Record SRN 110-xxxx, where xxxx is the first three or four digits of the menu number displayed in the upper-right corner of the diagnostic menu screen.  Go to Step 0020-15.
When running the Online Diagnostics, an installed device does not appear in the test list.	Ensure that the diagnostic support for the device was installed. The display configuration service aid can be used to determine whether diagnostic support is installed for the device.  Record SRN 110-101. Go to Step 0020-15. <b>Note:</b> Supplemental diskettes may be required if service aids are run from standalone diagnostics.
The IBM ARTIC960 Quad T1/E1 adapter diagnostics display a message indicating that the interface board (PMC) is either not installed or is malfunctioning.	Install a PMC board if not already installed.  When running online diagnostics on any of the IBM ARTIC960 family of adapters and the message indicates that the PMC is not installed, but it is installed, do the following: <ul style="list-style-type: none"> <li>• Reseat the PMC board, then run diagnostics.</li> <li>• If the response is the same, replace the PMC and then go to Verify a repair.</li> </ul>
The symptom was not found in the table.	Return to the Start of Call.

- **Step 0020-12**

The following step analyzes a console display problem.

Find your type of console display in the following table. Follow the instructions given in the Action column.

Type of Console Display	Action
TTY-type terminal	Be sure the TTY terminal attributes are set correctly. See "Running the Diagnostic Programs from a TTY Terminal" in AIX fast-path isolation procedure.  If you did not find a problem with the attributes, go to the documentation for this type of TTY terminal, and continue problem determination. If you do not find the problem, record SRN 111-259, then go the Step 0020-15.
Graphics display	Go to the documentation for this type of graphics display, and continue problem determination. If you do not find the problem, record SRN 111-82c, then go to Step 0020-15.
HMC (Hardware Management Console)	Go to the HMC service procedures in Troubleshooting the HMC. If HMC tests find no problem, there may be a problem with the communication between the HMC and the managed system. If the HMC communicates with the managed system through a network interface, verify whether the network interface is functional. If the HMC communicates with the managed system through the HMC interface, check the cable between the HMC and the managed system. If it is not causing the problem, suspect a configuration problem of the HMC communications setup.

- **Step 0020-13**

There is a problem with the keyboard.

Find the type of keyboard you are using in the following table. Follow the instructions given in the Action column.

Keyboard Type	Action
Type 101 keyboard (U.S.). Identify by the size of the Enter key. The Enter key is in only one horizontal row of keys.	Record SRN 111-736, then go to Step 0020-15.
Type 102 keyboard (W.T.). Identify by the size of the Enter key. The Enter key extends into two horizontal rows.	Record SRN 111-922; then go to Step 0020-15.
Kanji-type keyboard. (Identify by the Japanese characters.)	Record SRN 111-923; then go to Step 0020-15.
TTY terminal keyboard	Go to the documentation for this type of TTY terminal and continue problem determination.
HMC (Hardware Management Console)	Go to the HMC service procedures in Troubleshooting the HMC. If HMC tests find no problem, there may be a problem with the communication between the HMC and the managed system. If the HMC communicates with the managed system through a network interface, verify whether the network interface is functional. If the HMC communicates with the managed system through the HMC interface, check the cable between the HMC and the managed system. If it is not causing the problem, suspect a configuration problem of the HMC communications setup.

- **Step 0020-14**

The diagnostics did not detect a problem.

If the problem is related to either the system unit or the I/O expansion box, refer to the service documentation for that unit.

If the problem is related to an external resource, use the problem determination procedures, if available, for that resource.

If a problem occurs when running online diagnostics but not when running the stand-alone diagnostics, suspect a software problem.

Check for the presence of supplemental diagnostic material, such as diskettes or documentation. This is possibly a problem with software or intermittent hardware. If you think that you have an intermittent hardware problem, go to “MAP 0040: Intermittent problem isolation” on page 318.

- **Step 0020-15**

Take the following actions:

1. Handle multiple SRNs and error codes in the following order:
  - a. 8-Digit Error Codes.
  - b. SRNs with a source code other than F or G.
  - c. SRNs with a source code of F. Run online diagnostics in advanced and problem determination mode to obtain maximum isolation.
  - d. SRNs with a source code of G.

**Note:** The priority for multiple SRNs with a source of G is determined by the time stamp of the failure. Follow the action for the SRN with the earliest time stamp first.

- e. Device SRNs and error codes (5-digit SRNs).

If a group has multiple SRNs, it does not matter which SRN is handled first.

2. Find the SRN.

If the SRN is not listed, look for it in the following:

- Any supplemental service manual for the device
- The diagnostic problem report screen for additional information
- The “Service Hints” service aid in AIX Tasks and Service Aids

3. Perform the action listed.

4. If you replace a part, go to Verify a repair.

- **Step 0020-16**

Look up the AIX IPL progress codes for definitions of configuration program indicators. They are normally 0xxx or 2xxx.

**Is a configuration program indicator displayed?**

- NO** Go to the “Problems with loading and starting the operating system (AIX and Linux)” on page 294.
- YES** Record SRN 101-xxxx (where xxxx is the rightmost three or four digits or characters of the configuration program indicator). Go to Step 0020-17.

- **Step 0020-17**

**Is a physical location code or an AIX location code displayed on the operator panel display?**

- NO** Go to Step 0020-15.
- YES** Record the location code, then go to Step 0020-15.

## **MAP 0030: Additional problem determination**

This MAP is used for problems that still occur after all FRUs indicated by the SRN or error code have been exchanged.

### **Purpose of this MAP**

Use this MAP for problems that still occur after all FRUs indicated by the SRN or error code have been exchanged.

**Note:** Check the action text of the SRN before proceeding with this MAP. If there is an action listed, perform that action before proceeding with this MAP.

- **Step 0030-1**

Some external devices (including rack drawers that contain devices) have their own problem determination procedures. If the problem is related to an external device that has its own problem determination procedure, run those procedures if not already run. If they do not correct the problem, continue with this MAP.

- **Step 0030-2**

The problem may have been caused by a resource that has not been tested. System Checkout tests all resources. If the online Diagnostics are installed and you are able to load them, then **All Resources** under the Diagnostic Selection menu should be run. If you get a different SRN, look up the SRN in the SRN chapters and perform the listed action. If you are unable to run **All Resources** under the Diagnostic Selection menu or you do not get another SRN when running it, continue with this MAP.

- **Step 0030-3**

If the problem is related to a SCSI device, SCSI bus, or SCSI controller, go to “MAP 0050: SCSI bus problems” on page 320. If you are unable to isolate the problem with MAP 0050, continue with Step 0030-4.

- **Step 0030-4**

1. Find the resource(s) that are identified by the SRN or error code in the following table.
2. Perform the first action listed for the resource.
3. If you exchange a FRU or change a switch setting, test the resource again.
4. If the action does not correct the problem, perform the next action until all actions have been tried. If an action says to exchange a FRU that you have already exchanged, go to the next action. If an action corrects the problem, go to Verify a repair.
5. If you perform all of the actions and do not correct the problem, check the Service Hints service aid for information. If the service aid does not help, call your service support structure.

Failing Resource	Repair Action
SCSI Device	Exchange the SCSI controller. Replace the power supply.
Pluggable SCSI or IDE controller	Exchange the backplane into which the adapter is plugged.
Keyboard, tablet, mouse, dials, LPF keys, diskette drive	Check the cable attaching the device to its adapter. If you do not find a problem, exchange the device’s adapter.
Pluggable adapters, CPU cards, and controllers	Determine whether the adapter contains any attached FRUs such as fuses, DRAMs, and crossover cables. <ol style="list-style-type: none"> <li>1. Check or exchange any attached FRU on the resource.</li> <li>2. If the adapter is plugged into a riser card, check or exchange the riser card.</li> <li>3. Exchange the backplane into which the adapter is plugged.</li> </ol>
System and I/O backplanes	Contact your service support structure.
Built-In system ports	Replace the service processor if present.
A device attached to the system by a cable and an adapter.	<ol style="list-style-type: none"> <li>1. Replace the adapter for the device.</li> <li>2. Replace the cable to the device.</li> </ol>
IDE Device	Replace the cable between the IDE controller and the device. If the IDE controller is packaged on a backplane, replace that backplane, otherwise replace the adapter containing the IDE controller.

## MAP 0040: Intermittent problem isolation

This MAP provides a structured way of analyzing intermittent problems.

## Purpose of this MAP

This MAP provides a structured way of analyzing intermittent problems. It consists of two tables: Hardware Symptoms and Software Symptoms.

Because software or hardware can cause intermittent problems, consider all symptoms relevant to your problem.

## How to use this MAP

This MAP contains information about causes of intermittent symptoms. In the following tables, find your symptoms, and read the list of things to check.

When you exchange a FRU, go to Verify a repair to check out the system.

## Hardware symptoms

**Note:** This table spans several pages.

Symptom of hardware problem	Things to check for
Any hardware log entry in the error log.	Use the Hardware Error Report service aid to view the error log and check for: <ul style="list-style-type: none"><li>• Multiple errors on devices attached to the same SCSI bus.</li><li>• Multiple errors on devices attached to the same async adapter.</li><li>• Multiple errors on internally installed devices only.</li></ul> Contact your service support structure for assistance with error report interpretation.
Hardware-caused system crashes	<ul style="list-style-type: none"><li>• The connections on the CPU planar or CPU card</li><li>• Memory modules for correct connections</li><li>• Connections to the system planar.</li><li>• Cooling fans operational</li><li>• The environment for a too-high or too-low operating temperature.</li><li>• Vibration: proximity to heavy equipment.</li></ul>
System unit powers off a few seconds after powering On.	<ul style="list-style-type: none"><li>• Fan speed. Some fans contain a speed-sensing circuit. If one of these fans is slow, the power supply powers the system unit off.</li><li>• Correct voltage at the outlet into which the system unit is plugged.</li><li>• Loose power cables and fan connectors, both internal and external.</li></ul>
System unit powers off after running for more than a few seconds.	<ul style="list-style-type: none"><li>• Excessive temperature in the power supply area.</li><li>• Loose cable connectors on the power distribution cables.</li><li>• Fans turning at full speed after the system power has been on for more than a few seconds.</li></ul>

Symptom of hardware problem	Things to check for
Only internally installed devices are failing.	<p>Check the following items that are common to more than one device:</p> <ul style="list-style-type: none"> <li>• Ground connections on all of the disk drives and other types of drives installed.</li> <li>• Loose connections on the power cables to the planars, drives, fans, and battery.</li> <li>• System unit cooling. Is the input air temperature within limits? Are all the fans running at full speed? Are any of the vent areas blocked?</li> <li>• Signal cables to the diskette drives, and the power supply.</li> <li>• SCSI device signal cables for loose connectors and terminators.</li> <li>• Loose SCSI device address jumpers.</li> <li>• Possible contamination of any device that has a cleaning procedure. See the operator guide for cleaning instructions.</li> <li>• Excessive static electricity.</li> <li>• Correct voltage at the system unit power outlet</li> </ul>
Only externally attached devices are failing.	<p>Check the following items that are common to more than one device.</p> <ul style="list-style-type: none"> <li>• Check the SCSI signal cables to the devices for loose connectors and terminators.</li> <li>• Check devices that use jumpers to set the SCSI address for loose jumpers.</li> <li>• Check any device that has a cleaning procedure for contamination. See the operator guide for cleaning instructions.</li> <li>• Check for excessive static electricity.</li> <li>• Check the outlet that the device is plugged into for correct voltage.</li> <li>• Check the error log for entries for the adapter driving the failing devices.</li> <li>• Check the temperature of the devices. Are the cooling vents blocked? Are the fans running?</li> <li>• Check for other devices near the failing device that may be radiating noise (displays, printers, and so on).</li> </ul>

## Software symptoms

Symptom of software problem	Things to check for
Any symptom you suspect is related to software.	Use the software documentation to analyze software problems.
Software-caused system crashes	<p>Check the following software items:</p> <ul style="list-style-type: none"> <li>• Is the problem only with one application program?</li> <li>• Is the problem only with one device?</li> <li>• Does the problem occur on a recently installed program?</li> <li>• Was the program recently patched or modified in any way?</li> <li>• Is the problem associated with any communication lines?</li> <li>• Check for static discharge occurring at the time of the failure.</li> </ul>

## MAP 0050: SCSI bus problems

Use this MAP to analyze problems with a SCSI bus.

### Purpose of this MAP

Use this MAP to analyze problems with a SCSI bus.

## Considerations

- To prevent hardware damage or erroneous diagnostic results from a system with its power turned on, use "PCI hot-plug manager" subtask "replace/remove PCI hot plug adapter" before connecting or disconnecting cables or devices.
- Also, use this MAP for SCSI adapters that are built into system backplanes or I/O backplanes. If this procedure calls for replacing a SCSI adapter and the SCSI adapter is built into the system backplane or I/O backplane, replace the system backplane or I/O backplane as appropriate.
- If the failure is a terminator power failure (SRNs xxx-226, xxx-240, xxx-800), always allow five minutes for the PTC to cool.
- The differential version of the adapter has socket-type terminators to support high-availability. If this is the adapter's configuration, the terminators would have been removed from the adapter. MAP steps requiring the removal of the cable from the adapter do not apply, because an adapter that is not terminated always fails diagnostics. Proper SCSI diagnostics require proper termination. If the configuration involves a Y-cable, leave it, with the appropriate terminator, attached to the adapter. Or, place an external differential terminator on the external port.
- If the system uses shared disk-drive hardware or a high-availability configuration, ensure that the other system that is sharing the devices is not using the devices. For additional information concerning high-availability configurations, see "SCSI service hints" on page 299.
- For intermittent problems that cannot be resolved with this MAP, refer to "SCSI service hints" on page 299.
- If the SCSI bus is attached to a RAID subsystem, refer to the RAID subsystem documentation for any problem determination. If the RAID adapter is a PCI-X RAID adapter, refer to the *PCI-X SCSI RAID Controller Reference Guide for AIX*.

Follow the steps in this MAP to isolate a SCSI bus problem.

**Note:** This procedure removes devices and components from a SCSI bus until a problem or a symptom or problem is eliminated. If you follow the entire procedure, you will remove all components of a SCSI bus in the following order:

1. Hot-swap devices
2. Devices that are not hot-swap
3. SCSI Enclosure Services (SES) device or enclosures
4. SCSI cables
5. SCSI adapter

Do the following:

- **Step 0050-1**  
**Have changes been made recently to the SCSI configuration?**  
NO Go to Step 0050-2.  
YES Go to Step 0050-5.
- **Step 0050-2**  
**Are there any hot-swap devices (SCSI disk drives or media devices) controlled by the adapter?**  
NO Go to Step 0050-3.  
YES Go to Step 0050-11.
- **Step 0050-3**  
**Are there any devices other than hot-swappable devices controlled by the adapter?**  
NO Go to Step 0050-4.  
YES Go to Step 0050-13.
- **Step 0050-4**

**Is an enclosure or drawer that supports hot-swap devices controlled by the adapter?**

**NO** Go to Step 0050-22.

**YES** Go to Step 0050-15.

• **Step 0050-5**

This step handles cases where recent changes have been made to the SCSI configuration.

Using the first three digits of the SRN, refer to the FFC listing and determine if the adapter is single-ended or differential.

**Is the adapter a single-ended adapter?**

**NO** Go to Step 0050-6.

**YES** Go to Step 0050-7.

• **Step 0050-6**

The adapter's termination jumper settings may be incorrect. Power off the system, and inspect jumper J7.

**Are the jumpers correct?**

**NO** Go to Step 0050-8.

**YES** Go to Step 0050-9.

• **Step 0050-7**

If the adapter *is not* being used in a high-availability configuration, be sure sockets RN1, RN2, and RN3 are populated.

If the adapter *is* being used in a high-availability configuration, be sure sockets RN1, RN2, and RN3 *are not* populated.

Go to Step 0050-9.

• **Step 0050-8**

1. Correct the jumper settings and reinstall the adapter and all cables.

2. Power on the system, and run diagnostics in system verification mode on the adapter.

**Did the diagnostic pass?**

**NO** Go to Step 0050-9.

**YES** Go to Step 0050-10.

• **Step 0050-9**

Check for the following problems:

– Address conflicts between devices.

– Cabling problems such as configurations that exceed the maximum cable lengths, missing termination, or excessive termination.

**Did you find a problem?**

**NO** Go to Step 0050-2.

**YES** Go to Step 0050-10.

• **Step 0050-10**

1. Correct the problem.

2. Power on the system, and run diagnostics in system verification mode on the adapter.

**Did a failure occur?**

**NO** Go to Verify a repair.

**YES** Go to Step 0050-2.

• **Step 0050-11**

This step determines if a hot-swap device is causing the failure.

1. Go to Preparing for hot-plug SCSI device or cable deconfiguration.
2. Disconnect all hot-swap devices attached to the adapter.
3. Go to After hot-plug SCSI device or cable deconfiguration.
4. If the Missing Options menu displays, select the option **The resource has been turned off, but should remain in the system configuration** for all the devices that were disconnected.
5. Run the diagnostics in system verification mode on the adapter.

**Did a failure occur?**

**NO** Go to Step 0050-12.

**YES** Go to Step 0050-3.

• **Step 0050-12**

Go to Preparing for hot-plug SCSI device or cable deconfiguration. Reconnect the hot-plug devices one at a time. After reconnecting each device, do the follow:

1. Go to After hot-plug SCSI device or cable deconfiguration.
2. Rerun the diagnostics on the adapter.
3. If the adapter fails, the problem may be with the last device reconnected. Perform these substeps:
  - a. Follow repair procedures for that last device.
  - b. Rerun diagnostics on the adapter.
  - c. If diagnostics fail, replace the SES backplane corresponding to the slot for the device.
  - d. Rerun diagnostics.
  - e. If diagnostics fail, replace the last device.
  - f. Rerun diagnostics on the adapter.
  - g. If diagnostics pass, go to Verify a repair. Otherwise, contact your support center.

**Note:** A device problem can cause other devices attached to the same SCSI adapter to go into the defined state. Ask the system administrator to make sure that all devices attached to the same SCSI adapter as the device that you replaced are in the available state.

4. If no errors occur, the problem could be intermittent. Make a record of the problem. Running the diagnostics for each device on the bus may provide additional information.

• **Step 0050-13**

This step determines if a device other than a hot-swappable device is causing the failure. Follow these steps:

1. Go to Preparing for hot-plug SCSI device or cable deconfiguration.
2. Disconnect all devices attached to the adapter (except for the device from which you boot to run diagnostics; you may want to temporarily move this device to another SCSI port while you are trying to find the problem).
3. Go to After hot-plug SCSI device or cable deconfiguration.
4. If the Missing Options menu displays, select the option **The resource has been turned off, but should remain in the system configuration** for all the devices that were disconnected.
5. Run the diagnostics in system verification mode on the adapter.

**Did a failure occur?**

**NO** Go to Step 0050-14.

**YES** Go to Step 0050-4.

• **Step 0050-14**

Reconnect the devices one at time. After reconnecting each device, follow this procedure:

1. Rerun the diagnostics in system verification mode on the adapter.

2. If there is a failure, the problem should be with the last device reconnected. Follow the repair procedures for that device, then go to Verify a repair.
3. If no errors occur, the problem could be intermittent. Make a record of the problem. Running the diagnostics for each device on the bus may provide additional information.

- **Step 0050-15**

This step determines whether the SCSI Enclosure Services (SES) controller, which provides hot-plug capability for SCSI drives in the server, is causing the problem.

**Note:** In most cases the SES controller is integrated on the backplane that is used to connect SCSI devices, for example a disk drive backplane. If your system has hot-plug capability and the SES controller is separate from the SCSI drive backplane, there will be an intermediate card on the SCSI bus between the SCSI adapter and the device or SCSI backplane. You will have to make a visual check to see if there are any intermediate cards on the SCSI bus that is displaying a problem.

**Does a separate SES controller plug into the SCSI device backplane?**

**NO** Go to Step 0050-18.

**YES** Go to Step 0050-16.

- **Step 0050-16**

Follow these steps:

1. Power off the system.
2. Remove the intermediate SES controller card. Locate the SES controller part number under System parts.
3. Power on the system.
4. If the Missing Options menu displays, select the option **The resource has been turned off, but should remain in the system configuration** for all the devices that were disconnected.
5. Run the diagnostics in system verification mode on the adapter.

**Did a failure occur?**

**NO** Go to Step 0050-17.

**YES** Go to Step 0050-18.

- **Step 0050-17**

Follow these steps:

1. Power off the system.
2. Replace the intermediate SES controller card.
3. Go to Verify a repair.

- **Step 0050-18**

Follow these steps:

1. Go to Preparing for hot-plug SCSI device or cable deconfiguration.
2. Disconnect all cables attached to the SCSI adapter. For SCSI differential adapters in a high-availability configuration, see Considerations.
3. Go to After hot-plug SCSI device or cable deconfiguration.
4. If the Missing Options menu displays, select the option **The resource has been turned off, but should remain in the system configuration** for all the devices that were disconnected.
5. Run the diagnostics in system verification mode on the adapter.

**Did a failure occur?**

**NO** Go to Step 0050-19.

**YES** Replace the adapter, then go to Verify a repair.

- **Step 0050-19**

Follow these steps:

1. Go to Preparing for hot-plug SCSI device or cable deconfiguration.
2. Reconnect the cables to the adapter.

**Does the SES controller (an intermediated SES controller) plug into the backplane?**

**NO** Go to Step 0050-20.

**YES** Go to Step 0050-21.

- **Step 0050-20**

Follow these steps:

1. Replace the SES controller. Locate the intermediate SES controller part number under System parts.
2. Power on the system.
3. If the Missing Options menu displays, select the option **The resource has been turned off, but should remain in the system configuration** for all the devices that were disconnected.
4. Run the diagnostics in system verification mode on the adapter.

**Did a failure occur?**

**NO** Go to Verify a repair.

**YES** Go to Step 0050-21.

- **Step 0050-21**

One of the cables remaining in the system is defective. Refer to System parts for the cable part numbers. Replace the parts one at a time in the order listed. Follow these steps for each FRU replaced:

1. Rerun the diagnostics for the adapter.
2. If there is any failure, continue with the next FRU.
3. If there is no failure, go to Verify a repair.

- **Step 0050-22**

Follow these steps:

1. Go to Preparing for hot-plug SCSI device or cable deconfiguration.
2. Disconnect all cables attached to the adapter (except for the cable to the device from which you boot to run diagnostics; you may want to temporarily move this device to another SCSI port while you are trying to find the problem).
3. Go to After hot-plug SCSI device or cable deconfiguration.
4. If the Missing Options menu displays, select the option **The resource has been turned off, but should remain in the system configuration** for all the devices that were disconnected.
5. Run the diagnostics on the adapter.

**Did a failure occur?**

**NO** Go to Step 0050-23.

**YES** Replace the adapter, then go to Verify a repair.

- **Step 0050-23**

One of the cables remaining in the system is defective. Refer to System parts for the cable part numbers. Replace the parts one at time in the order listed. Follow these steps for each FRU replaced:

1. Rerun the diagnostics for the adapter.
2. If there is any failure, continue with the next FRU.
3. If there is no failure, go to Verify a repair.

## **Preparing for hot-plug SCSI device or cable deconfiguration**

Use this procedure when you are preparing to deconfigure a hot-plug SCSI device or cable. This procedure will help determine if a SCSI device or SCSI device cable is causing your system problem.

## Purpose of this procedure:

Use this procedure to determine if a SCSI device or SCSI device cable is causing the symptom.

Disconnect all cables attached to the adapter, (except for the cable to the device from which you boot to run diagnostics; temporarily move these device cables to another SCSI port while you are trying to find the problem).

1. Go to Running the AIX online and standalone diagnostics log and perform the prerequisite tasks described in the Before you begin topic.
2. Determine which SCSI adapter you plan to remove the cables or devices from.
3. Adapter slots are numbered on the rear of the system unit, record the slot number and location of each adapter being removed.
4. Ensure that any processes or applications that might use the adapter are stopped.
5. Enter the system diagnostics by logging in as "root" user or as the "celogin" user. Type the **diag** command on the AIX command line.
6. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter. The FUNCTION SELECTION menu appears.
7. From the FUNCTION SELECTION menu, select Task Selection, then press Enter.
8. From the Task Selection list, select Hot Plug Manager, then select PCI Hot Plug Manager.
9. From the PCI Hot Plug Manager menu, select Unconfigure a Device, then press Enter.
10. Press F4 or ESC 4 to display the Device Names menu.
11. Select the adapter from which you are removing the cables or devices in the Device Names menu.
12. In the Keep Definition field, use the tab key to answer Yes.
13. In the Unconfigure Child Devices field, use the Tab key to answer Yes, then press Enter. The ARE YOU SURE screen displays.
14. Press Enter to verify the information. A successful deconfiguration is indicated by the "OK" message displayed next to the Command field at the top of the screen.
15. Press F4 or ESC 4 twice to return to the Hot Plug Manager menu.
16. Select replace/remove PCI Hot Plug adapter.
17. Select the slot that has the adapter you want to remove the cables or devices from in the system.
18. Select **Remove**.

**Note:** A fast blinking amber LED located at the back of the machine indicates the slot that you selected.

19. Press Enter. This places the adapter in the "action" state, meaning it is ready to be removed from the system. (You do not need to remove the adapter, unless it makes removing the cables attached to it easier).

## After hot-plug SCSI device or cable deconfiguration

Use this procedure after you deconfigure or hot-plug a SCSI device to ensure that the replaced component was successfully installed.

1. Press Enter, then continue to follow the screen instructions until you receive a message that the replacement is successful. A successful replacement is indicated by the OK message displayed next to the command field at the top of the screen.
2. Press the F3 or ESC 3 key to return to the **PCI Hot-Plug Manager** menu.
3. Press the F3 or ESC 3 key to return to the **Hot-Plug Manager** menu.
4. Press the F3 or ESC 3 key to return to the **TASK** selection list.
5. Select **Log Repair Action**.
6. Select the adapter you just removed the cables or devices from, then press Enter.
7. Press Commit (F7 or ESC 7), then press Enter.

8. Press the F10 or the ESC 0 key to exit diagnostics.
9. Type the **diag -a** command on the command line.

## MAP 0054: PCI-X SCSI bus problems

Use this MAP to determine which FRUs may need to be replaced in order to solve a SCSI bus-related problem on a PCI-X SCSI or PCI-X SCSI RAID adapter.

### Purpose of this MAP

Use the following to determine which FRUs may need to be replaced in order to solve a SCSI bus-related problem on a PCI-X SCSI or PCI-X SCSI RAID adapter.

### Considerations

- Remove power from the system before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage or erroneous diagnostic results.
- Note that some systems have SCSI and PCI-X bus interface logic integrated onto the system boards and use a pluggable RAID enablement card (a non-PCI form factor card) for these SCSI and PCI-X buses. An example of such a RAID enablement card is FC 5709. For these configurations, replacement of the RAID enablement card is unlikely to solve a SCSI bus-related problem, because the SCSI bus interface logic is on the system board.
- Some adapters provide two connectors, one internal and one external, for each SCSI bus. For this type of adapter, it is not acceptable to use both connectors for the same SCSI bus at the same time. SCSI bus problems are likely to occur if this is done. However, it is acceptable to use an internal connector for one SCSI bus and an external connector for another SCSI bus. The internal and external connectors are labeled to indicate which SCSI bus they correspond to.

**Attention:** RAID adapters should not be replaced when SCSI bus problems exist, except with assistance from your service support structure. Because the adapter may contain non-volatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter when SCSI bus problems exist.

**Attention:** Do not remove functioning disks in a disk array without assistance from your service support structure. A disk array may become degraded or failed if functioning disks are removed, and additional problems may be created.

Follow the steps in this MAP to isolate a PCI-X SCSI bus problem.

#### • Step 0054-1

Identify the SCSI bus on which the problem is occurring on by examining the hardware error log. To view the hardware error log, do the following:

1. Invoke diagnostics and select **Task Selection** on the Function Selection screen.
2. Select **Display Hardware Error Report**.
3. Choose one of the following options:
  - If the type of adapter is not known, select **Display Hardware Errors for Any Resource**.
  - If the adapter is a PCI-X SCSI adapter, select **Display Hardware Errors for PCI-X SCSI Adapters**.
  - If the adapter is a PCI-X SCSI RAID adapter, select **Display Hardware Errors for PCI-X SCSI RAID Adapters**.
4. Select the resource, or select **All Resources** if the resource is not known. If you had previously selected **Display Hardware Errors for Any Resource**, then select **All Resources**.
5. On the Error Summary screen, look for an entry with a SRN corresponding to the problem which sent you here, and select it.

**Note:** If multiple entries exist for the SRN, some entries might be old or the problem has occurred on multiple entities (adapters, disk arrays, or devices). Older entries can be ignored; however, this MAP may need to be used multiple times if the same problem has occurred on multiple entities.

6. Select the hardware error log to view.

While viewing the hardware error log, under the Detail Data and SENSE DATA headings, identify the first four bytes of the hexadecimal data (for example, nnnn nnnn nnnn nnnn ...). The four bytes identified in the error log can be interpreted as:

00bb ssLL

where:

- bb, when not FF, identifies the adapter's SCSI bus
- ss, when not FF, identifies the SCSI ID of a device
- LL, when not FF, identifies the logical unit number (LUN) of a device

Go to Step 0540-2.

• **Step 0054-2**

**Are the last two bytes of the four bytes identified in Step 0540-1, equal to FFFF (for example, 00bb FFFF, where bb identifies the adapter's SCSI bus)?**

**NO** Go to Step 0540-4.

**YES** Go to Step 0540-3.

• **Step 0054-3**

While the error persists, replace the components of the failing SCSI bus in the following order:

1. Cable on bus bb (if present)
2. Adapter (if SCSI bus interface logic is on the adapter) or system board (if SCSI bus interface logic is on the system board)

To replace a component, and see if the problem was corrected, do the following:

1. Follow the removal and replacement procedure for the component as previously described in this step.
2. Run diagnostics in system verification mode on the adapter.

When the problem is resolved, go to Verify a repair.

• **Step 0054-4**

**Are the last two bytes of the four bytes identified in Step 0540-1, equal to FF00 (for example, 00bb FF00, where bb identifies the adapter's SCSI bus)?**

**NO** Go to Step 0540-6.

**YES** Go to Step 0540-5.

• **Step 0054-5**

While the error persists, replace the components of the failing SCSI bus in the following order:

1. Cable on bus bb (if present)
2. Adapter (if SCSI bus interface logic is on the adapter) or system board (if the SCSI bus interface logic is on the system board)
3. DASD backplane attached to bus bb (if present)

To replace a component, and see if the problem was corrected, do the following:

1. Follow the removal and replacement procedure for the component as previously described in this step.
2. Run diagnostics in system verification mode on the adapter.

When the problem is resolved, go to Verify a repair.

• **Step 0054-6**

While the error persists, replace the components of the failing SCSI bus in the following order:

1. Device on bus bb with SCSI ID ss
2. Cable on bus bb (if present)
3. Adapter (if SCSI bus interface logic is on the adapter) or system board (if SCSI bus interface logic is on the system board)

To replace a component and see if the problem was corrected, do the following:

1. Follow the removal and replacement procedure for the component as previously described in this step.
2. Run diagnostics in system verification mode on the adapter.

When the problem is resolved, go to Verify a repair.

## MAP 0070: 888 sequence in operator panel display

Use this MAP when you receive an 888 sequence on the operator panel display or monitor.

### Purpose of this MAP

An 888 sequence in operator panel display suggests that either a hardware or software problem has been detected and a diagnostic message is ready to be read.

**Note:** The 888 will not necessarily flash on the operator panel display.

- **Step 0070-1**

Perform the following steps to record the information contained in the 888 sequence message.

1. Wait until the 888 sequence displays.
2. Record, in sequence, every code displayed after the 888. On systems with a 3-digit or a 4-digit operator panel, you may need to press the system's "reset" button to view the additional digits after the 888. Stop recording when the 888 digits reappear.
3. Go to Step 0070-2.

- **Step 0070-2**

Using the first code that you recorded, use the following list to determine the next step to use.

**Type 102**

Go to Step 0070-3.

**Type 103**

Go to Step 0070-4.

- **Step 0070-3**

A type 102 message generates when a software or hardware error occurs during system execution of an application. Use the following information to determine the content of the type 102 message.

The message readout sequence is:

102 = Message type RRR = Crash code (the three-digit code that immediately follows the 102) SSS = Dump status code (the three-digit code that immediately follows the Crash code).

Record the crash code and the dump status code from the message you recorded in Step 0070-1.

**Are there additional codes following the dump status?**

**No** Go to Step 0070-5.

**Yes** The message also has a type 103 message included in it. Go to Step 0070-4 to decipher the SRN and field replaceable unit (FRU) information in the type 103 message.

**Note:** Type 102 messages have no associated SRNs.

- **Step 0070-4**

A type 103 message is generated by the hardware when certain types of hardware errors are detected. Use the following steps and information you recorded in Step 0070-1 to determine the content of the type 103 message.

The message readout sequence is:

103 = Message type (x)xxx (y)yyy = SRN (where (x)xxx = the three- or four-digit code following the 103 and (y)yyy is the three- or four-digit code following the (x)xxx code).

1. Record the SRN and FRU location codes from the recorded message.
2. Find the SRN in the Service Request Number List and perform the indicated action.

**Note:** The only way to recover from an 888 type of halt is to turn off the system unit.

• **Step 0070-5**

Perform the following steps:

1. Turn off the system unit power.
2. Turn on the system unit power, and load the online diagnostics in service mode.
3. Wait until one of the following conditions occurs:
  - You are able to load the diagnostics to the point where the Diagnostic Mode Selection menu displays.
  - The system stops with an 888 sequence.
  - The system appears to hang.

**Is the Diagnostic Mode Selection menu displayed?**

**No** Go to Start of Call.

**Yes** Go to Step 0070-6.

• **Step 0070-6**

Run the **All Resources** options under Advanced Diagnostics in Problem Determination Mode.

**Was an SRN reported by the diagnostics?**

**No** This is possibly a software-related 888 sequence. Follow the procedure for reporting a software problem.

**Yes** Record the SRN and its location code information. Find the SRN in the SRN Listing and do the indicated action.

## MAP 0230: Platform error problem resolution

Use this MAP to resolve problems reported by SRNs A00-xxx to A25-xxxx.

### Step 0230-1

1. The last character of the SRN is bit-encoded as follows:

8	4	2	1	
				Replace all FRUs listed
				Hot-swap is supported
				Software or Firmware could be the cause
				Reserved

2. Refer to the last character in the SRN. A 4, 5, 6, or 7 indicates a possible software or firmware problem.

**Does the last character indicate a possible software or firmware problem?**

**NO** Go to Step 0230-4

**YES** Go to Step 0230-2.

### Step 0230-2

Ask the customer if any software or firmware has been installed recently.

**Has any software or firmware been installed recently?**

**NO** Go to Step 0230-4.

**YES** Go to Step 0230-3.

### Step 0230-3

Suspect the new software or firmware.

Check with your support center for any known problems with the new software or firmware.

**Are there any known problems with the software or firmware?**

**NO** Go to Step 0230-4.

**YES** Obtain and follow the procedure to correct the software problem. This completes the repair.

### Step 0230-4

**Were any FRUs or location code reported with the SRN?**

**NO** Go to Step 0230-5.

**YES** Go to Step 0230-9

### Step 0230-5

Run the diagnostics in problem determination mode on **sysplanar0**.

**Were there any FRUs reported with the SRN?**

**NO** Go to Step 0230-6.

**YES** Go to Step 0230-9

### Step 0230-6

**Did the system display: "Previous Diagnostic Results - Do you want to review the previously displayed error?"**

**NO** Go to Step 0230-7.

**YES** You have a pending item in the error log for which there is no corresponding log repair action. To see this error, select **YES** at the prompt. Information from the error log displays in order of last event first. Record the error code, the FRU names and the location code of the FRUs. Go to Step 0230-7

### Step 0230-7

**Were there any other SRNs that begin with an A00 to A1F reported?**

**NO** Go to Step 0230-8.

**YES** Go to Step 0230-1 and use the new SRN.

### Step 0230-8

Attempt to boot the system on slow boot mode.

If the system boots, run the diagnostics in problem determination mode on **sysplanar0**

**Were any new error codes or SRNs reported?**

**NO** Call your support center.

**YES** Follow the procedure for the new error code or SRN.

#### **Step 0230-9**

1. Obtain the list of physical location codes and FRU numbers that were listed on the Problem Report Screen. The list can be obtained by running the **sysplanar0** diagnostics or using the task **Display Previous Diagnostic Results**.
2. Record the physical location codes and FRU numbers.
3. Refer to the last character in the SRN. A 2, 3, 6, or 7 indicates that hot-swap is possible.

**Does the last character indicate that hot-swap is possible?**

**NO** Go to Step 0230-10.

**YES** Go to Step 0230-14

#### **Step 0230-10**

**Note:** If necessary, refer to Powering on and powering off the system for information on system shutdown and powering the system on and off.

1. If the operating system is running, perform the operating system's shutdown procedure.
2. Turn off power to the system.
3. Refer to the last character in the SRN. A 1, 3, 5, or 7 indicates that all FRUs listed on the Problem Report Screen need to be replaced. For SRNs ending with any other character, exchange one FRU at a time, in the order listed.

**Note:** Use the appropriate procedure under Removing and replacing FRUs to replace any FRUs indicated.

4. Turn on power to the system.
5. Load Running the online diagnostics in service mode.

**Note:** If the Diagnostics Operating Instructions do not display or you are unable to select the option **Task Selection**, check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 0020: Problem determination procedure" on page 311 and get a new SRN.

6. Wait until the **Diagnostics Operating Instructions** are displayed or the system appears to stop.
7. Press Enter.
8. Select **Diagnostic Routines** at the function selection menu.
9. Select **System Verification**.
10. If a missing options exist, particularly if it is related to the device that was replaced, resolve the missing options before proceeding
11. Select the option **Task Selection**.
12. Select the option **Log Repair Action**.
13. Log a repair action for each replaced resource.
14. If the resource associated with your repair action is not displayed on the resource list, select **sysplanar0**.
15. Return to the Task Selection Menu.

16. If the FRU that was replaced was memory and the system is running as a full system partition, select **Run Exercisers** and run the short exerciser on all the resources, otherwise proceed to Step 0230-15.
17. If you ran the exercisers in Step 0230-10, substep 16, return to the Task Selection menu.
18. Select **Run Error Log Analysis** and run analysis on all the resources.

**Was a problem reported?**

**NO** The repair is complete. Go to Verify a repair.

**YES** Go to Step 0230-11.

**Step 0230-11**

**Is the problem the same as the original problem?**

**NO** The symptom has changed. Check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 0020: Problem determination procedure" on page 311 and get a new SRN.

**YES** Go to Step 0230-12.

**Step 0230-12**

Look at the physical location codes and FRU part numbers you recorded.

**Have you exchanged all the FRUs that were listed?**

**NO** Go to Step 0230-13.

**YES** The SRN did not identify the failing FRU. Call your support person for assistance.

**Step 0230-13**

1. After performing a shutdown of the operating system, turn off power to the system.
2. Remove the new FRU and install the original FRU.
3. Exchange the next FRU in list.
4. Turn on power to the system.
5. Load Running the online diagnostics in service mode.

**Note:** If the Diagnostics Operating Instructions do not display or you are unable to select the option **Task Selection**, check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 0020: Problem determination procedure" on page 311 and get a new SRN.

6. Wait until the Diagnostics Operating Instructions are displayed or the system appears to stop.
7. Press Enter.
8. Select **Diagnostic Routines** at the function selection menu.
9. Select **System Verification**.
10. If a missing options exist, particularly if it is related to the device that was replaced, resolve the missing options before proceeding.
11. Select the option **Task Selection**.
12. Select the option **Log Repair Action**.
13. Log a repair action for each replaced resource.
14. If the resource associated with your action does not appear on the Resource List, select **sysplanar0**.
15. Return to the Task Selection Menu.

16. If the FRU that was replaced was memory and the system is running as a full system partition, select **Run Exercisers** and run the short exerciser on all the resources, otherwise proceed to Step 0230-15.
17. If you ran the exercisers in Step 0230-13, substep 16, return to the Task Selection menu.
18. Select **Run Error Log Analysis** and run analysis on all the resources.

**Was a problem reported?**

**NO** The repair is complete. Go to Verify a repair.

**YES** Go to Step 0230-11.

**Step 0230-14**

The FRUs can be hot-swapped. If you do not want to use the hot-swap, go to Step 0230-10.

**Note:** See the hot-swap procedures in the Removing and replacing FRUs section.

1. Refer to the last character in the SRN. A 1, 3, 5, or 7 indicates that all FRUs listed on the Problem Report Screen must be replaced. For SRNs ending with any other character, exchange one FRU at a time, in the order listed.
2. If available, use the CE Login and enter the **diag** command.  
  
**Note:** If CE Login is not available, have the system administrator enter superuser mode and then enter the **diag** command.
3. After the Diagnostics Operating Instructions display, press Enter.
4. Select the option **Task Selection**.
5. Select the option **Log Repair Action**.
6. If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**.
7. Log a repair action for each replaced resource.
8. Return to the Task Selection menu.
9. For systems running as a full system partition, select **Run Exercisers** and run the short exerciser on all resources.
10. Use the option **Log Repair Action** in the Task Selection menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with your repair action. If it is not displayed on the resource list, select **sysplanar0**.

**Note:** On systems with a Fault Indicator LED, this changes the Fault Indicator LED from the fault state to the normal state.

**Was a problem reported?**

**NO** The repair is complete. Return the system to the customer.

**YES** Go to Step 0230-15.

**Step 0230-15**

**Is the problem the same as the original problem?**

**NO** The symptom has changed. Check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 0020: Problem determination procedure" on page 311 and get a new SRN.

**YES** Go to Step 0230-16.

**Step 0230-16**

**334** Shorter title here if needed, for spine

Look at the physical location codes and FRU part numbers you recorded.

**Have you exchanged all the FRUs that were listed?**

**NO** Go to Step 0230-17.

**YES** The SRN did not identify the failing FRU. Call your support person for assistance.

#### **Step 0230-17**

1. Remove the new FRU and install the original FRU.
2. Exchange the next FRU in the list.
3. Return to the Task Selection Menu.
4. Select the option **Log Repair Action**.
5. Log a repair action for each replaced resource.
6. If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**.
7. Return to the Task Selection Menu.
8. For systems running as a full system partition, select **Run Exercisers** and run the short exerciser on all resources.
9. If you ran the exercisers in substep Step 0230-17, substep 8.
10. Select **Run Error Log Analysis** and run analysis on all exchanged resources.

**Was a problem reported?**

**NO** The repair is complete. Return the system to the customer.

**YES** Go to Step 0230-15.

## **MAP 0235: System Array Self-Repair Problem Resolution**

Use this MAP to resolve problems reported by SRNS A11-560 to A11-580.

**Note:** The following steps may require that the system be rebooted to invoke Array bit steering, so you may wish to schedule deferred maintenance with the system administrator to arrange a convenient time to reboot their system.

#### **Step 0235-1**

**Was the SRN A11-560?**

**NO** Go to Step 0235-3.

**YES** Go to Step 0235-2.

#### **Step 0235-2**

Logged in as root or using CE Login, at the AIX command line type **diag** then press enter. Use the **Log Repair Action** option in the TASK SELECTION menu to update the AIX error log. Select **sysplanar0**.

**Note:** On systems with fault indicator LED, this changes the fault indicator LED from the FAULT state to the NORMAL state.

**Were there any other errors on the resource reporting the array bit steering problem?**

**NO** Step 0235-4.

**YES** Resolve those errors before proceeding.

#### **Step 0235-3**

Logged in as root or using CE Login, at the AIX command line type `diag` then press enter. Use the **Log Repair Action** option in the TASK SELECTION menu to update the AIX error log. Select `procx`, where `x` is the processor number of the processor that reported the error.

**Note:** On systems with fault indicator LED, this changes the fault indicator LED from the FAULT state to the NORMAL state.

**Were there any other errors on procx?**

**NO** Step 0235-4.

**YES** Resolve those errors before proceeding.

#### Step 0235-4

Schedule deferred Maintenance with the customer. When it is possible, reboot the system to invoke Array Bit steering.

#### Step 0235-5

After the system has been rebooted, log in as root or use CE Login. At the AIX command line, run diagnostics in problem determination mode to determine if the array bit steering was able to correct the problem.

If diagnostics are not run (for instance, if the system returns to **Resource Selection** menu after running diagnostics in problem determination mode) or there is no problem on the resource that originally reported the problem, then array bit steering was able to correct the problem. Exit this MAP and go to <http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/iphau/x0410.htm>.

## MAP 0260: System hangs during resource configuration

Use this MAP when the system unit hangs while configuring a resource.

### Purpose of this MAP

This MAP handles problems when the system unit hangs while configuring a resource.

- **Step 0260-1**

The last three or four digits of the SRN following the dash (-) match a failing function code number.

Look at the System parts and find the failing function code that matches the last three or four digits of your SRN, following the dash. Record the FRU part number and description (use the first FRU part listed when multiple FRUs are listed).

The physical location code, AIX location code, or device name is displayed on the operator panel.

**Do you have either a physical location code or AIX location code displayed?**

**No** Go to Step 0260-4.

**Yes** Go to Step 0260-2.

- **Step 0260-2**

**Are there any FRUs attached to the device described by the physical location code or AIX location code?**

**No** Go to Step 0260-6.

**Yes** Go to Step 0260-3.

- **Step 0260-3**

Remove this kind of FRU attached to the device described in the location code one at a time. Note whether the system still hangs after each device is removed. Repeat this step until you no longer get a hang, or all attached FRUS have been removed from the adapter or device.

**Has the symptom changed?**

**No** Go to Step 0260-4.

**Yes** Use the location code of the attached device that you removed when the symptom changed, and go to Step 0260-6.

• **Step 0260-4**

**Does your system unit contain only one of this kind of FRU?**

**No** Go to Step 0260-5.

**Yes** Go to Step 0260-6.

• **Step 0260-5**

One of the FRUs of this kind is defective.

Remove this kind of FRU one at a time. Test the system unit after each FRU is removed. Stop when the test completes successfully or when you have removed all of the FRUs of this kind.

**Were you able to identify a failing FRU?**

**No** Go to "PFW1540: Problem isolation procedures" on page 348.

**Yes** Go to Step 0260-6.

• **Step 0260-6**

1. Turn off the system unit.

2. Exchange the FRU identified by the location code or Step 0260-5.

**Is this system capable of running online diagnostics in service mode?**

**No** Go to Step 0260-7.

**Yes** Go to Step 0260-8.

• **Step 0260-7**

1. Turn on the system unit.

2. Load the standalone diagnostics. See Running the standalone diagnostics from CD-ROM.

3. Wait until the Diagnostic Operating Instructions display or the system appears to have stopped.

**Are the DIAGNOSTIC OPERATING INSTRUCTIONS displayed?**

**NO** Go to Step 0260-9.

**YES** Go to Verify a repair.

• **Step 0260-8**

1. Turn on the system unit.

2. Load the standalone diagnostics. See Running the standalone diagnostics from CD-ROM.

3. Wait until the Diagnostic Operating Instructions display or the system appears to have stopped.

**Are the DIAGNOSTIC OPERATING INSTRUCTIONS displayed?**

**NO** Go to Step 0260-9.

**YES** Go to Verify a repair.

• **Step 0260-9**

Look at the operator panel display.

**Is the number displayed the same as the last three or four digits after the dash (-) of your SRN?**

**NO** The symptom changed. Check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 0020: Problem determination procedure" on page 311 and get a new SRN.

**YES** Go to Step 0260-10.

- **Step 0260-10**

**Was the FRU you exchanged an adapter or a planar?**

**NO** Go to Step 0260-11.

**YES** Go to "PFW1540: Problem isolation procedures" on page 348.

- **Step 0260-11**

**Was the FRU you exchanged a device?**

**NO** Go to "PFW1540: Problem isolation procedures" on page 348.

**YES** Go to Step 0260-12.

- **Step 0260-12**

The adapter for the device may be causing the problem.

1. Turn off the system unit.
2. Exchange the adapter for the device.

**Note:** If the AIX operating system is not used on the system, start diagnostics from an alternate source.

3. Turn on the system unit. If c31 is displayed, follow the instructions to select a console display.
4. Load the standalone diagnostics. See Running the standalone diagnostics from CD-ROM.
5. Wait until the DIAGNOSTIC OPERATING INSTRUCTIONS display or the system appears to have stopped.

**Are the DIAGNOSTIC OPERATING INSTRUCTIONS displayed?**

**NO** Go to "PFW1540: Problem isolation procedures" on page 348.

**YES** Go to Verify a repair.

## **MAP 0270: SCSI RAID problem resolution and verification**

Use this MAP to resolve SCSI RAID adapter, cache, or drive problems.

### **Purpose of This MAP**

Use this MAP to resolve SCSI RAID adapter, cache, or drive problems.

#### **Notes:**

1. This MAP assumes that the RAID adapter and drive microcode is at the correct level.
2. This MAP applies only to PCI, not PCI-X, RAID adapters.

**Attention:** If the FRU is a disk drive or an adapter, ask the system administrator to perform the steps necessary to prepare the device for removal.

- **Step 0270-1**

1. If the system displayed a FRU part number on the screen, use that part number. If there is no FRU part number displayed on the screen, refer to the SRN listing. Record the SRN source code and the failing function codes in the order listed.
2. Find the failing function codes in the FFC listing, and record the FRU part number and description of each FRU.

Go to Step 0270-2.

- **Step 0270-2**

**Is the FRU a RAID drive?**

**NO** Go to Step 0270-6.

**YES** Go to Step 0270-3.

- **Step 0270-3**

If the RAID drive you want to replace is not already in the **failed** state, then ask the customer to run the PCI SCSI Disk Array Manager using `smit` to fail the drive that you want to replace. An example of this procedure is:

1. Log in as root user.
2. Type `smit pdam`.
3. Select **Fail a Drive in a PCI SCSI Disk Array**.
4. Select the appropriate disk array by placing the cursor over that array and press Enter.
5. Select the appropriate drive to fail based on the Channel and ID called out in diagnostics. The **Fail a Drive** screen will appear.
6. Verify that you are failing the correct drive by looking at the Channel ID row. Press Enter when verified correct. Press Enter again.
7. Press **F10** and type `smit pdam`
8. Select **Change/Show PCI SCSI RAID Drive Status → Remove a Failed Drive**.
9. Select the drive that just failed.

Go to Step 0270-4.

- **Step 0270-4**

Replace the RAID drive using the RAID HOT PLUG DEVICES service aid:

**Note:** The drive you want to replace must be either a SPARE or FAILED drive. Otherwise, the drive would not be listed as an IDENTIFY AND REMOVE RESOURCES selection within the RAID HOT PLUG DEVICES screen. In that case you must ask the customer to put the drive into FAILED state. For information on putting the drive in a FAILED state, refer the customer to the SAS RAID Controller Reference Guide for AIX.

1. Select the option **RAID HOT PLUG DEVICES** within the HOT PLUG TASK under DIAGNOSTIC SERVICE AIDS.
2. Select the RAID adapter that is connected to the RAID array containing the RAID drive you want to remove, then select COMMIT.
3. Choose the option **IDENTIFY** in the IDENTIFY AND REMOVE RESOURCES menu.
4. Select the physical disk which you want to remove from the RAID array and press Enter. The disk will go into the IDENTIFY state, indicated by a flashing light on the drive.
5. Verify that it is the physical drive you want to remove, then press Enter.
6. At the IDENTIFY AND REMOVE RESOURCES menu, choose the option **REMOVE** and press Enter. A list of the physical disks in the system that may be removed will be displayed.
7. If the physical disk you want to remove is listed, select it and press Enter. The physical disk will go into the REMOVE state, as indicated by the LED on the drive. If the physical disk you want to remove is not listed, it is not a SPARE or FAILED drive. Ask the customer to put the drive in the FAILED state before you can proceed to remove it. For information on putting the drive in a FAILED state, refer the customer to the SAS RAID Controller Reference Guide for AIX.
8. Refer to the service guide for the system unit or enclosure that contains the physical drive for removal and replacement procedures for the following substeps:
  - a. Remove the old hot-swap RAID drive.
  - b. Install the new hot-swap RAID drive. After the hot-swap drive is in place, press Enter. The drive will exit the REMOVE state, and will go to the NORMAL state after you exit diagnostics.

**Note:** There are no elective tests to run on a RAID drive itself under diagnostics (the drives are tested by the RAID adapter).

Go to Step 0270-5.

- **Step 0270-5**

If the RAID did not begin reconstructing automatically, perform the following steps.

**Adding a Disk to the RAID array and Reconstructing:**

Ask the customer to run the PCI SCSI Disk Array Manager using **smit**. An example of this procedure is:

1. Log in as root user.
2. Type `smit pdam`.
3. Select **Change/Show PCI SCSI RAID Drive Status**.
4. Select **Add a Spare Drive**.
5. Select the appropriate adapter.
6. Select the channel and ID of the drive that was replaced.
7. Press Enter when verified.
8. Press F3 until you return to the **Change/Show PCI SCSI RAID Drive Status** screen.
9. Select **Add a Hot Spare**.
10. Select the drive you just added as a spare.

If there was no hot spare previously installed in the array, the array will begin reconstructing immediately. Reconstruction time will vary based on the size of the RAID array. Allow 1-2 hours for completion.

To check the progress of the reconstruction:

1. Log in as root user.
2. Type `smit pdam`.
3. Select **List PCI SCSI RAID Arrays**.
4. Choose the array containing the drive you replaced.

If the state of the RAID array is reconstructing, then it is in process of reconstructing. If it is optimal, then reconstruction has completed.

5. Press F10 to exit.

Go to Step 027017.

- **Step 0270-6**

**Is the FRU a RAID adapter base card, RAID adapter cache card, or RAID adapter battery?**

**NO** Go to Step 0270-15.

**YES** Go to Step 0270-7.

- **Step 0270-7**

**Do you want to change the FRU using a hot-swap operation?**

**NO** Power off the system, and remove the RAID adapter. Go to Step 0270-8.

**YES** Remove the RAID adapter. Go to Step 0270-8.

- **Step 0270-8**

**Is the FRU you want to replace a RAID adapter cache card or RAID adapter battery?**

**NO** Go to Step 0270-10.

**YES** Go to Step 0270-9.

- **Step 0270-9**

Replace the FRU onto the existing base card.

Go to Step 0270-11.

- **Step 0270-10**

After physically removing the base card from the system, remove any other good FRUs (RAID cache card or cache battery) from the RAID base card adapter. Plug these FRUs on to the replacement RAID base card adapter FRU.

Go to Step 0270-11.

- **Step 0270-11**

**Did you change the FRU using a hot-swap operation?**

**NO** Install the RAID adapter assembly into the system. Power on the system and log in to AIX. Go to Step 0270-12.

**YES** Install the RAID adapter assembly into the system. Go to Step 0270-12.

- **Step 0270-12**

**Was the replacement FRU a RAID base card?**

**NO** Go to Step 0270-14.

**YES** Go to Step 0270-13.

- **Step 0270-13**

**Attention:** Prior to cabling the SCSI RAID adapter to the subsystem, check for preexisting configurations on the replacement SCSI RAID base card. The replacement base card can overwrite your system's configuration data if it already has a configuration written to it. Check it before cabling the SCSI RAID subsystem array.

Ask to customer to check for preexisting configuration on the SCSI RAID base card. Below is an example of this procedure:

1. Log in as root (if not already root).
2. Type `smit pdam`.
3. Select **List PCI SCSI RAID Arrays**.
4. If no RAID arrays are listed, then there are no preexisting configurations on the base card.
5. Press F10 key to exit.

If a preexisting configuration exists on the base card, ask the customer to run the PCI SCSI Disk Array Manager using **smitty**.

1. Log in as root (if not already root).
2. Type `smit pdam` from the AIX command prompt (if not already in the RAID manager).
3. Select **Recovery Options**.
4. Select **Clear PCI SCSI RAID Adapter Configuration**. Select the adapter that you just installed. Press Enter to confirm.
5. Return to the **Recovery Options** menu (if not already there). Select **Resolve PCI SCSI RAID Adapter Configuration**. Select **Accept Configuration on Drives**. Select the adapter that you just installed. Press Enter to confirm. The configuration on the new adapter should now match the configuration existent on the drives.
6. Press F10 to exit.

You may now proceed to cable the RAID system array.

Go to Step 0270-16.

- **Step 0270-14**

Ask the customer to resynchronize the RAID array configuration:

1. Log in as root (if not already root).
2. Type `smit pdam`.
3. Select **Recovery Options**.
4. Select **Resolve PCI SCSI RAID Adapter Configuration**.

5. Select **Retry Current Configuration**.
6. Select the appropriate scraid (SCSI RAID) adapter. A message will be displayed as to the success of the operation.
7. Press F10 to exit.

Go to Step 0270-16.

- **Step 0270-15**

Other RAID FRUs require that the system be shut down prior to replacement.

1. If the operating system is running, perform the operating system shutdown procedure (get help if needed).
2. Turn off the system power.
3. Replace the FRU indicated by the FFC.

Go to Step 0270-16.

- **Step 0270-16**

Run the diagnostics in system verification mode on the RAID subsystem.

**Did the diagnostics run with no trouble found?**

**NO** Go to Step 0270-18.

**YES** Go to Step 0270-17.

- **Step 0270-17**

1. Use the option **Log Repair Action** in the TASK SELECTION menu to update the AIX error log. Select **scraidX** (where X is the RAID adapter number of the RAID subsystem you have been working on).

**Note:** On systems with fault indicator LED, this changes the fault indicator LED from the Fault state to the Normal state.

2. While in diagnostics, go to the FUNCTION SELECTION menu. Select the option **Advanced Diagnostics Routines**.
3. When the DIAGNOSTIC MODE SELECTION menu displays, select the option **System Verification**. Run the diagnostic test on **scraidX** (where X is the RAID adapter number).

**Did the diagnostics run with no trouble found?**

**NO** Go to the Step 0270-18.

**YES** If you changed the service processor or network settings, restore the settings to the value they had prior to servicing the system.

This completes the repair; return the system to the customer. Go to Closing a service call.

- **Step 0270-18**

**Have you exchanged all the FRUs that correspond to the failing function codes?**

**NO** Go to Step 0270-19.

**YES** The SRN did not identify the failing FRU. Schedule a time to run diagnostics in service mode. If the same SRN is reported in service mode, go to "MAP 0030: Additional problem determination" on page 317.

- **Step 0270-19**

**Note:** Note: Before proceeding, remove the FRU you just replaced and install the original FRU in its place.

Use the next FRU on the list and go to Step 0270-2.

## **MAP 0280: Console and keyboard problem resolution**

Use this MAP to resolve console and keyboard problems when the system is booting.

## Purpose of this MAP

Use this MAP to resolve console and keyboard problems when the system is booting. For other boot problems and concerns, go to “Problems with loading and starting the operating system (AIX and Linux)” on page 294.

Entry table	
Keyboard problem	Go to Step 0280-1.
Graphic adapter problem	Go to Step 0280-2.
Terminal problem	Go to Step 0280-3.

- **Step 0280-1**

The system fails to respond to keyboard entries.

This problem is most likely caused by a faulty keyboard, keyboard adapter, or keyboard cable.

Try the FRUs in the following order. Test each FRU by retrying the failing operation.

1. Keyboard.
2. Keyboard adapter, typically located on the system board.
3. Keyboard cable, if not included with the keyboard.

**Were you able to resolve the problem?**

**NO** Go to “MAP 0030: Additional problem determination” on page 317.

**YES** Go to Verify a repair.

- **Step 0280-2**

1. Some systems have a graphic adapter POST. If a graphic adapter POST is supported and it indicates a failure, follow the procedures in the system guide to resolve the problem.
2. If a graphic adapter POST is supported and it does not indicate a failure, suspect the display or display cable.
3. If the system does not have a graphic adapter POST, go to the display’s problem determination procedures. If you do not find a problem, replace the graphics adapter.

**Were you able to resolve the problem?**

**NO** Go to “MAP 0030: Additional problem determination” on page 317.

**YES** Go to Verify a repair.

- **Step 0280-3**

Go to the problem determination procedure for the terminal. If you do not find a problem, suspect the serial port adapter or terminal cable.

**Were you able to resolve the problem?**

**NO** Call your support person.

**YES** Go to Verify a repair.

## MAP 0285: Multipath I/O problem resolution

Use this MAP to handle SRN A23-001 and ssss-640 (where ssss is the 3 or 4 digit Failing Function Code (FFC) of an SCSD drive) to check the path from adapter to device.

### Purpose of this MAP

Use this MAP to handle SRN A23-001 and ssss-640 (where ssss is the 3 or 4 digit FFC of an SCSD drive) to check the path from adapter to device.

**Note:** Not all devices support MPIO. Before proceeding with this MAP, make sure that the devices on both ends of the missing path support MPIO.

- **Step 0285-1**

Look at the problem report screen for the missing path. After the resource name and FRU, the next column identifies the missing path between resources (for example, scsi0 -> hdisk1). This indicates the missing path between the two resources, scsi0 (the parent resource) and hdisk1 (the child resource).

**Is the cabling present between the two resources?**

**NO** Go to Step 0285-2.

**YES** Go to Step 0285-4.

**Note:** In the following MAP steps, if no path previously existed between a parent and child device, the child device will have to be changed from the defined to the available state, otherwise you will be unable to select the child device to which you want to establish a path.

- **Step 0285-2**

1. Power off the system.
2. Connect the correct cable between the two resources.
3. Power on the system, rebooting AIX.
4. At the AIX command line, type `smitty mpio`.
5. Choose **MPIO Path Management**.
6. Select **Enable Paths**.
7. Select **Enable Paths for a Device**.
8. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
9. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
10. Press Enter.

**Did the smitty menu complete with no errors?**

**NO** Go to Step 0285-4.

**YES** Go to Step 0285-3.

- **Step 0285-3**

To verify that the device path is present, rerun `diag -a`.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

**Do you still have a path problem?**

**NO** Go to Verify a repair.

**YES** Go to Step 0285-4.

- **Step 0285-4**

1. Power off the system.
2. Reseat the cables between the device and the adapter that have the missing path.
3. Power on the system, and reboot AIX.
4. At the AIX command line, type `smitty mpio`.
5. Choose **MPIO Path Management**.
6. Select **Enable Paths**.
7. Select **Enable Paths for a Device**.

8. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
9. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
10. Press Enter.

**Did the smitty menu complete with no errors?**

**NO** Go to Step 0285-6.

**YES** Go to Step 0285-5.

• **Step 0285-5**

To verify that the device path is present, rerun `diag -a`

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

**Do you still have a path problem?**

**NO** Go to Verify a repair.

**YES** Go to Step 0285-6.

• **Step 0285-6**

You may have a problem with the driver interface or connector on either the parent or child device.

1. Power off the system (refer to the system service guide if necessary).
2. Remove the cables to the parent device.
3. Replace the cable(s) that go between the parent and child device (if present).
4. Reattach the cables to the parent device.
5. Power on the system, rebooting AIX (refer to the system service guide if necessary).
6. At the AIX command line, type `smitty mpio`.
7. Choose **MPIO Path Management**.
8. Select **Enable Paths**.
9. Select **Enable Paths for a Device**.
10. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
11. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
12. Press Enter.

**Did the smitty menu complete with no errors?**

**NO** Go to Step 0285-7.

**YES** Go to Step 0285-8.

• **Step 0285-7**

To verify that the device path is present, rerun `diag -a`.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If the letter P is not shown in front of the resource, or if the system returns to the command prompt, or you get a message without the resource list being displayed, then the problem has been resolved.

**Do you still have a problem?**

**NO** Go to Verify a repair.

**YES** Go to Step 0285-8.

• **Step 0285-8**

You may have a problem with the driver interface or connector on either the parent or child device.

1. Power off the system.
2. Remove the cables to the parent device.
3. Replace the parent device.
4. Reattach the cables to the parent device.
5. Power on the system, rebooting AIX.
6. At the AIX command line, type `smitty mpio`.
7. Choose **MPIO Path Management**.
8. Select **Enable Paths**.
9. Select **Enable Paths for a Device**.
10. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
11. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
12. Press Enter.

**Did the smitty menu complete with no errors?**

**NO** Go to Step 0285-9.

**YES** Go to Step 0285-10.

- **Step 0285-9**

To verify that the device path is present, rerun `diag -a`.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

**Do you still have a path problem?**

**NO** Go to Verify a repair.

**YES** Go to Step 0285-10.

- **Step 0285-10**

You may have a problem with the driver interface or connector on the child device.

1. Power off the system.
2. Remove the cables to the child device.
3. Replace the child device (in the case of a SCSI or SAF-TE backplane, replace the backplane first, followed by the child device).
4. Reattach the cables to the child device.
5. Power on the system, rebooting AIX.
6. At the AIX command line, type `smitty mpio`.
7. Choose **MPIO Path Management**.
8. Select **Enable Paths**.
9. Select **Enable Paths for a Device**.
10. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
11. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
12. Press Enter.

**Did the smitty menu complete with no errors?**

**NO** Neither the cabling, nor the parent, nor the child seem to be causing the problem. Contact your service support structure.

**YES** Go to Step 0285-11.

- **Step 0285-11**

Rerun `diag -a` to verify that the device path is present.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

**Do you still have a path problem?**

**NO** Go to Verify a repair.

**YES** Neither the cabling, nor the parent, nor the child seem to be causing the problem. Contact your service support structure.

## **MAP 0291: Missing device or bus problem resolution**

Use this MAP when a bus or device (such as a disk drive) is reported as a missing resource by the diagnostics.

### **Purpose of this MAP**

Use this MAP when a bus or device (such as a disk drive) is reported as a missing resource by the diagnostics.

- **Step 0291-1**

The device may be missing because of a power problem.

If the missing device is located in a drawer or enclosure, do the following:

1. Check for any environmental problem indicators such as power or cooling that may indicate a problem.
2. If a problem is indicated, follow the service documentation to resolve the problem.

Go to Step 0291-2.

- **Step 0291-2**

Inspect the cables (signal and power) of the missing device. Be sure all connections are in place and power is present. Refer to the system or enclosure documentation containing the power wiring diagram or system cable diagram to locate specific cables, determine the cable numbering, and check for a problem-determination procedure. Look for obvious power cabling problems, such as missing or loose cable connectors.

Power problems can sometimes be identified by checking other devices that use the same power source (such as a diskette drive and a SCSI tape drive, even though they have different controllers). If other devices that share a power source are reported as missing devices, suspect the power source as the problem.

If there is a power problem, refer to "Power problems" on page 137.

**Did you find a problem?**

**NO** Go to Step 0291-3.

**YES** Correct the problem, then go to Verify a repair.

- **Step 0291-3**

**Is the missing device a SCSI device installed in a SCSI Enclosure Services (AIX resource SESx) or SAF-TE (AIX resource SAFTEEx), or a SCSI device installed in either type of enclosure?**

**NO** Go to "MAP 0210: General problem resolution" on page 293.

**YES** Go to Step 0291-4.

- **Step 0291-4**

Run the advanced diagnostics in problem determination mode on the SCSI Enclosure Services or SAF-TE device.

**Note:** A no trouble found result, or if you get another SRN with the same digits before the dash as you previously had from the diagnostics, indicates that you did *not* get a different SRN.

**Did you get a different SRN than when you ran the diagnostics previously?**

**NO** Go to Step 0291-5.

**YES** Take the following action:

1. Look up the SRN.

**Note:** If the SRN is not listed in the Service Request Number topics, look for additional information in the following:

- Any supplemental service manual for the device.
- The diagnostic Problem Report screen.
- The Service Hints service aid in Running the AIX online and standalone diagnostics log.

2. Perform the action listed.

• **Step 0291-5**

Power off the system. Disconnect all hot-swap devices attached to the adapter. Reconnect the hot-swap devices one at time. After reconnecting each device, do the following:

1. Power on the system and boot the system in the same mode that you were in when you received the symptom that led you to this MAP Powering on and powering off the system .
2. At an AIX command prompt, run the **diag -a** command to check for missing options.
3. Verify that the device you just added to the system is present in the system configuration. If other devices are now missing, the problem may be with the last device that was reconnected or reinstalled. Perform these substeps:
  - a. If the device that was just reinstalled in the system is missing, or if additional devices are now missing, replace the last device that was reinstalled.
  - b. Rerun **diag -a** to check for missing options.
  - c. If devices are no longer missing, go to Verify a repair. Otherwise, contact your support center.

**Note:** A device problem can cause other devices attached to the same SCSI adapter to go into the defined state. Ask the system administrator to make sure that all devices attached to the same SCSI adapter as the device that you replaced are in the available state.

4. If no devices were missing, the problem could be intermittent. Make a record of the problem. Running the diagnostics for each device on the bus may provide additional information. If you have not replaced FFCs B88, 190, and 152 go to “MAP 0210: General problem resolution” on page 293, using FFCs (in order): B88, 190, and 152.

## PFW1540: Problem isolation procedures

The PFW1540 procedures are used to locate problems in the processor subsystem or I/O subsystem(s).

If a problem is detected, these procedures help you isolate the problem to a failing unit. Find the symptom in the following table; then follow the instructions given in the Action column.

Problem Isolation Procedures	
Symptom/Reference Code/Checkpoint	Action
You have or suspect an I/O card or I/O subsystem failure.You received one of the following SRNs or reference codes: 101-000, 101-517, 101-521, 101-538, 101-551 to 101-557, 101-559 to 101-599, 101-662, 101-727, 101-c32, 101-c33, 101-c70	Go to “PFW1542: I/O problem isolation procedure” on page 349.

Problem Isolation Procedures	
Symptom/Reference Code/Checkpoint	Action
You have or suspect a memory or processor subsystem problem. You received the following SRN or reference code: 101-185	Go to "PFW1548: Memory and processor subsystem problem isolation procedure" on page 364.
If you were directed to the PFW1540 procedure by an SRN and that SRN is not listed in this table.	Go to "PFW1542: I/O problem isolation procedure."

## FRU identify LEDs

Your system is configured with an arrangement of LEDs that help identify various components of the system. These include but are not limited to:

- Rack identify beacon LED (optional rack status beacon)
- Processor subsystem drawer identify LED
- I/O drawer identify LED
- RIO port identify LED
- FRU identify LED
- Power subsystem FRUs
- Processor subsystem FRUs
- I/O subsystem FRUs
- I/O adapter identify LED
- DASD identify LED

The identify LEDs are arranged hierarchically with the FRU identify LED at the bottom of the hierarchy, followed by the corresponding processor subsystem or I/O drawer identify LED, and the corresponding rack identify LED to locate the failing FRU more easily. Any identify LED in the system may be flashed; refer to Managing the Advanced system Management Interface (ASMI).

Any identify LED in the system may also be flashed by using the AIX diagnostic programs task "Identify and Attention Indicators". The procedure to use the AIX diagnostics task "Identify and Attention Indicators" is outlined in "Tasks and Service Aids" in Running the AIX online and standalone diagnostics log.

## PFW1542: I/O problem isolation procedure

This I/O problem-determination procedure isolates I/O card and I/O subsystem failures. When I/O problem isolation is complete, all cables and cards that are failing will have been replaced or reseated.

### Notes:

1. To avoid damage to the system or subsystem components, unplug the power cords before removing or installing a part.
2. This procedure assumes that either:
  - An optical drive is installed and connected to the integrated EIDE adapter, and an AIX standalone diagnostic CD-ROM is available.
  - OR
  - AIX standalone diagnostics can be booted from a NIM server.
3. If a power-on password or privileged-access password is set, you are prompted to enter the password before the AIX standalone diagnostic CD-ROM can load.
4. The term POST indicators refers to the device mnemonics that appear during the power-on self-test (POST).

5. The service processor might have been set by the user to monitor system operations and to attempt recoveries. You might want to disable these options while you diagnose and service the system. If these settings are disabled, make notes of their current settings so that they can be restored before the system is turned back over to the customer.

The following settings may be of interest.

#### **Monitoring**

(also called surveillance) From the ASMI menu, expand the System Configuration menu, then click **Monitoring**. Disable both types of surveillance.

#### **Auto power restart**

(also called unattended start mode) From the ASMI menu, expand **Power/Restart Control**, then click **Auto Power Restart**, and set it to disabled.

#### **Wake on LAN**

From the ASMI menu, expand **Wake on LAN**, and set it to disabled.

#### **Call Out**

From the ASMI menu, expand the Service Aids menu, then click **Call-Home/Call-In Setup**. Set the call-home system port and the call-in system port to disabled.

6. Verify that the system has not been set to boot to the SMS menus or to the open firmware prompt. From the ASMI menu, expand **Power/Restart Control** to view the menu, then click **Power On/Off System**. The AIX/Linux partition mode boot indicates Continue to Operating System.

Use this procedure to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU 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.

Perform the following procedure:

- **PFW1542-1**

1. Ensure that the diagnostics and the operating system are shut down.
2. Turn off the power.
3. Select slow system boot speed on the power on/off system menu under the power/restart control menu on the ASMI.
4. Turn on the power.
5. Insert the AIX diagnostic CD-ROM into the optical drive.

#### **Does the optical drive appear to operate correctly?**

**NO** Go to "Problems with loading and starting the operating system (AIX and Linux)" on page 294.

**YES** Continue to PFW1542-2.

- **PFW1542-2**

1. When the keyboard indicator is displayed (the word "keyboard"), if the system or partition gets that far in the IPL process, press the 5 key on the firmware console.
2. If you are prompted to do so, enter the appropriate password.

#### **Is the "Please define the System Console" screen displayed?**

**NO** Continue to PFW1542-3.

**YES** Go to PFW1542-4.

- **PFW1542-3**

The system is unable to boot AIX standalone diagnostics. Check the service processor error log (using the ASMI) and the operator panel for additional error codes resulting from the slow boot that was performed in PFW1542-1.

**Did the slow boot generate a different error code or partition firmware hang from the one that originally sent you to PFW1542?**

**NO** If you were sent here by an error code, and the error code did not change as the result of a slow boot, you have a processor subsystem problem. Go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 364. If you were sent here because the system is hanging on a partition firmware checkpoint, and the hang condition did not change as a result of the slow boot, go to PFW1542-5.

**YES** Restore fast boot on the power on/off system menu from the ASMI. Look up the new error code in the reference code index and perform the listed actions.

- **PFW1542-4**

The system stopped with the Please define the System Console prompt on the system console. AIX standalone diagnostics can be booted. Perform the following:

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. If the terminal type has not been defined, you must use the option **Initialize Terminal** on the FUNCTION SELECTION menu to initialize the AIX operating system environment before you can continue with the diagnostics. This is a separate operation from selecting the firmware console.
4. Select **Advanced Diagnostic Routines**.
5. When the DIAGNOSTIC MODE SELECTION menu displays, select **System Verification** to run diagnostics on all resources.

**Did running diagnostics produce a different symptom?**

**NO** Continue with the following sub-step.

**YES** Return to the Problem Analysis procedures with the new symptom.

6. Record any devices missing from the list of all adapters and devices. Continue with this procedure. When you have fixed the problem, use this record to verify that all devices appear when you run system verification.

**Are there any devices missing from the list of all adapters and devices?**

**NO** Reinstall all remaining adapters, if any, and reconnect all devices. Return the system to its original configuration. Be sure to select fast boot on the power on/off system menu on the ASMI. Go to Verify a repair.

**YES** The boot attempts that follow will attempt to isolate any remaining I/O subsystem problems with missing devices. Ignore any codes that may display on the operator panel unless stated otherwise. Continue to PFW1542-5.

- **PFW1542-5**

Examine RIO port 0 of the first RIO bus card in the base system unit drawer.

**Are there any I/O subsystems attached to this RIO card?**

**NO** Go to PFW1542-29.

**YES** Continue to PFW1542-6.

- **PFW1542-6**

There may be devices missing from one of more of the I/O subsystems, or one or more devices in the I/O subsystems may be causing the system or a partition to hang during IPL.

**Note:**

- Various types of I/O subsystems might be connected to this system.

- The order in which the RIO or GX+ adapters are listed is the order in which the adapters are used for attaching external I/O boxes. The first adapter listed for the system units (models E4A, E8A, and MMA) should be used in step PFW1548-2. The second adapter listed should be used in step PFW1548-7.

The RIO and 12X ports on these subsystems are shown in the following table. Use this table to determine the physical location codes of the RIO or 12X connectors that are mentioned in the remainder of this MAP.

Table 77. RIO ports location table

RIO Port	8203-E4A, 9407-M15, or 9408-M25 (base system)	8204-E8A or 9409-M50 (base system)	8234-EMA, 9117-MMA, 9406-MMA (base system drawer)	5088	5094	7311-D11	7314-G30 or 5796	7311-D20 or 5095
RIO port 0	Un-P1-C8-T2  Un-P1-C6-T2	Un-P1-C8-T2  Un-P1-C6-T2	Un-P1-C8-T2  (and U1-P1-C9-T2 if present)	Un-CB1-C10-00	Un-CB1-C08-00	Un-P1-C7-T1 (top connector)	Un-P1-C7-T2	Un-P1-C05-00  or Un-P1-C05-T2 (bottom connector)
RIO port 1	Un-P1-C8-T1  Un-P1-C6-T1	Un-P1-C8-T1  Un-P1-C6-T1	Un-P1-C8-T1  (and U1-P1-C9-T1 if present)	Un-CB1-C10-01	Un-CB1-C08-01	Un-P1-C7-T2	Un-P1-C7-T1	Un-P1-C05-01  or Un-P1-C05-T1 (top connector)

**Note:** Before continuing, check the cabling from the base system to the I/O subsystem(s) to ensure that the system is cabled correctly. Refer to the cabling information for your I/O enclosure for valid configurations. Record the current cabling configuration and then continue with the following steps.

In the following steps, the term *RIO* means either RIO or 12X.

1. Turn off the power. Record the location and machine type and model number, or feature number, of each I/O drawer or tower. In the following steps, use this information to determine the physical location codes of the RIO connectors that are referred to by their logical names. For example, if I/O subsystem #1 is a 7311-D20 drawer, RIO port 0 is Un-P1-C05-T2.
2. At the base system drawer, disconnect the cable connection at RIO port 0.
3. At the other end of the RIO cable referred to in step 2 of PFW1542-6, disconnect the I/O subsystem port connector 0. The RIO cable that was connected to RIO port 0 in the base system should now be loose; remove it. Record the location of this I/O subsystem and call it "subsystem #1".
4. Examine the connection at the I/O port connector 1 of the I/O subsystem recorded in step 3 of PFW1542-6. If the RIO cable attached to I/O port connector 1 connects to the I/O port connector 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #1, then go to step 8 of PFW1542-6.
5. At the base system, disconnect the cable connection at RIO port 1 and reconnect it to RIO port 0.

6. At the I/O subsystem recorded in step 3 of PFW1542-6, disconnect the I/O port connector 1 and reconnect to I/O port 0.
7. Verify that a single RIO cable connects base system RIO port 0 to the I/O subsystem recorded in step 4 port 0. Go to step 28 of PFW1542-6.
8. Record the location of the next I/O subsystem and call it "subsystem #2". This is the I/O subsystem that is connected to I/O port 1 of subsystem #1.
9. Examine the connection at the I/O port 1 of subsystem #2 recorded in step 8 of PFW1542-6. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #2 and call it "subsystem #3". Go to step 13 of PFW1542-6.
10. The RIO cable attached to the I/O port 1 of subsystem #2 is attached to port 1 of the base system. At the base system, disconnect the cable connection at RIO port 1 and reconnect it to RIO port 0.
11. On subsystem #2, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
12. Verify that a single RIO cable connects base system RIO port 0 to one or two I/O subsystems. Go to step 28 of PFW1542-6.
13. Examine the connection at the I/O port 1 of subsystem #3 recorded in step 9 of PFW1542-6. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of the subsystem #3 and call it "subsystem #4". Go to step 17 of PFW1542-6.
14. The RIO cable attached to the I/O port 1 of subsystem #3 is attached to port 1 of the base system. At the base system, disconnect the cable connection at RIO port 1 and reconnect it to RIO port 0.
15. On subsystem #3, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
16. Verify that a single RIO cable connects base system RIO port 0 to three I/O subsystems. Go to step 28 of PFW1542-6.
17. Examine the connection at the I/O port 1 of subsystem #4 recorded in step step 13 of PFW1542-6. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #4 and call it "subsystem #5". Go to step step 21 of PFW1542-6.
18. The RIO cable attached to the I/O port 1 of subsystem #4 is attached to port 1 of the base system. At the base system, disconnect the cable connection at RIO port 1 and reconnect it to RIO port 0.
19. On subsystem #4, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
20. Verify that a single RIO cable connects base system RIO port 0 to four I/O subsystems. Continue to step 28 of PFW1542-6.
21. Examine the connection at the I/O port 1 of subsystem #5 recorded in step step 17 of PFW1542-6. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #5 and call it "subsystem #6". Go to step step 25 of PFW1542-6
22. The RIO cable attached to the I/O port 1 of subsystem #5 is attached to port 1 of the base system. At the base system, disconnect the cable connection at RIO port 1 and reconnect it to RIO port 0.
23. On subsystem #5, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
24. Verify that a single RIO cable connects base system RIO port 0 to five I/O subsystems. Go to step 28 of PFW1542-6
25. The RIO cable attached to the I/O port 1 of subsystem #6 is attached to port 1 of the base system. At the base system, disconnect the cable connection at RIO port 1 and reconnect it to RIO port 0.
26. On subsystem #6, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.

27. Verify that a single RIO cable connects base system RIO port 0 to six I/O subsystems. Continue with step 28 of PFW1542-6
28. Turn on the power to boot the AIX standalone diagnostics from CD-ROM.
29. If the "Please define the system console" screen is displayed, follow the directions to select the system console.
30. Use the option **Display Configuration and Resource List** to list all of the attached devices and adapters.
31. Verify that all adapters and the attached devices are listed.

**Did the "Please define the System Console" screen display and are all adapters and attached devices listed?**

**NO** Go to PFW1542-7.

**YES** The RIO cable that was removed in step 3 above is defective. Replace this RIO cable.

- If six I/O subsystems are chained to RIO port 0 of the base system, connect the new RIO cable from subsystem #6 I/O port 1 to base system RIO port 1.
- If five I/O subsystems are chained to RIO port 0 of the base system, connect the new RIO cable from subsystem #5 I/O port 1 to base system RIO port 1.
- If four I/O subsystems are chained to RIO port 0 of the base system, connect the new RIO cable from subsystem #4 I/O port 1 to base system RIO port 1.
- If three I/O subsystems are chained to RIO port 0 of the base system, connect the new RIO cable from subsystem #3 I/O port 1 to base system RIO port 1.
- If two I/O subsystems are chained to RIO port 0 of the base system, connect the new RIO cable from subsystem #2 I/O port 1 to base system RIO port 1.
- If one I/O subsystem is chained to RIO port 0 of the base system, connect the new RIO cable from subsystem #1 I/O port 1 to base system RIO port 1.

Restore the system to its original configuration. Go to Verify a repair.

• **PFW1542-7**

The I/O attached to the other RIO ports are now isolated. Power off the system. Disconnect the cable connection at RIO port 0 of the base system.

• **PFW1542-8**

1. Turn on the power to boot the AIX standalone diagnostic CD-ROM.
2. If the "Please define the system console" screen is displayed, follow the directions to select the system console.
3. Use the option **Display Configuration and Resource List** to list all of the attached devices and adapters.
4. Check that all adapters and attached devices in the base system are listed.

If the "Please define the system console" screen was not displayed or all adapters and attached devices are not listed, the problem is in the base system.

**Was the "Please define the system console" screen displayed and were all adapters and attached devices listed?**

**NO** Go to PFW1542-29.

**YES** Go to PFW1542-21.

• **PFW1542-9**

For subsystem #1: **Are there any adapters in the I/O subsystem?**

**NO** Go to PFW1542-10.

**YES** Go to PFW1542-15.

• **PFW1542-10**

For subsystem #2: **Are there any adapters in the I/O subsystem?**

- NO Go to PFW1542-11.
- YES Go to PFW1542-16.
- **PFW1542-11**  
For subsystem #3: **Are there any adapters in the I/O subsystem?**  
NO Go to PFW1542-12.  
YES Go to PFW1542-17.
- **PFW1542-12**  
For subsystem #4: **Are there any adapters in the I/O subsystem?**  
NO Go to PFW1542-13.  
YES Go to PFW1542-18.
- **PFW1542-13**  
For subsystem #5: **Are there any adapters in the I/O subsystem?**  
NO Go to PFW1542-14.  
YES Go to PFW1542-19.
- **PFW1542-14**  
For subsystem #6: **Are there any adapters in the I/O subsystem?**  
NO Go to PFW1542-23.  
YES Go to PFW1542-20.
- **PFW1542-15 (Subsystem #1)**
  1. If it is not already off, turn off the power.
  2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
  3. Record the slot numbers of the adapters.
  4. Remove all adapters from the I/O subsystem.
  5. Turn on the power to boot the AIX standalone diagnostic CD-ROM.
  6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
  7. If the "Please select the system console" screen is displayed, follow the directions to select the system console.
  8. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
  9. Check that all adapters and attached devices are listed.

**Was the "Please define the system console" screen displayed and were all adapters and attached devices listed?**

  - NO Go to PFW1542-10.
  - YES Go to PFW1542-21.
- **PFW1542-16 (Subsystem #2)**
  1. If it is not already off, turn off the power.
  2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
  3. Record the slot numbers of the adapters.
  4. Remove all adapters from the I/O subsystem.
  5. Turn on the power to boot the AIX standalone diagnostic CD-ROM.
  6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
  7. If the "Please select the system console" screen is displayed, follow the directions to select the system console.

8. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Was the "Please define the system console" screen displayed and were all adapters and attached devices listed?**

**NO** Go to PFW1542-11.

**YES** Go to PFW1542-21.

• **PFW1542-17 (Subsystem #3)**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from the I/O subsystem.
5. Turn on the power to boot the AIX standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the "Please select the system console" screen is displayed, follow the directions to select the system console.
8. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Was the "Please define the system console" screen displayed and were all adapters and attached devices listed?**

**NO** Go to PFW1542-12.

**YES** Go to PFW1542-21.

• **PFW1542-18 (Subsystem #4)**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from the I/O subsystem.
5. Turn on the power to boot the AIX standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the "Please define the system console" screen is displayed, follow the directions to select the system console.
8. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Was the "Please define the system console" screen displayed and were all adapters and attached devices listed?**

**NO** Go to PFW1542-13.

**YES** Go to PFW1542-21.

• **PFW1542-19 (Subsystem #5)**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from the I/O subsystem.
5. Turn on the power to boot the AIX standalone diagnostic CD-ROM.

6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the "Please define the system console" screen is displayed, follow the directions to select the system console.
8. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Was the "Please define the system console" screen displayed and were all adapters and attached devices listed?**

**NO** Go to PFW1542-14.

**YES** Go to PFW1542-21.

• **PFW1542-20 (Subsystem #6)**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from the I/O subsystem.
5. Turn on the power to boot the AIX standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the "Please define the system console" screen is displayed, follow the directions to select the system console.
8. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Was the "Please define the system console" screen displayed and were all adapters and attached devices listed?**

**NO** Go to PFW1542-23.

**YES** Go to PFW1542-21.

• **PFW1542-21**

If the "Please define the system console" screen was displayed and all adapters and attached devices were not listed, the problem is with one of the adapters or attached devices that was removed or disconnected from the I/O subsystem.

1. Turn off the power.
2. Reinstall one adapter or device that was removed. Use the original adapters in their original slots when reinstalling adapters.
3. Turn on the power to boot the AIX standalone diagnostic CD-ROM.
4. If the "Please define the system console" screen is displayed, follow the directions to select the system console.
5. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
6. Check that all adapters and attached devices are listed.

**Was the "Please define the system console" screen displayed and were all adapters and attached devices listed?**

**NO** Go to PFW1542-22.

**YES** Reinstall the next adapter and device and return to the beginning of this step. Repeat this process until an adapter or device causes the "Please define the System Console" screen to not display, or all attached devices and adapters to not be listed.

After installing all of the adapters and the "Please define the System Console" screen does display and all attached devices and adapters are listed, return the system to its original configuration. Go to Verify a repair.

- **PFW1542-22**

Replace the adapter you just installed with a new adapter and retry booting AIX standalone diagnostics from CD-ROM.

1. If the "Please define the system console" screen is displayed, follow the directions to select the system console.
2. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
3. Check that all adapters and attached devices are listed.

**Was the "Please define the system console" screen displayed and were all adapters and attached devices listed?**

**NO** The I/O subsystem backplane is defective. Replace the I/O subsystem backplane. In all 4 subsystem types, the I/O subsystem backplane is Un-CB1. Then go to PFW1542-24.

**YES** The adapter was defective. Go to PFW1542-24.

- **PFW1542-23**

1. Turn off the power.
2. Disconnect the I/O subsystem power cables.
3. Replace the following parts, one at a time, if present, in the sequence listed:
  - a. I/O subsystem #1 backplane
  - b. I/O subsystem #2 backplane
  - c. I/O subsystem #3 backplane
  - d. I/O subsystem #4 backplane
  - e. I/O subsystem #5 backplane
  - f. I/O subsystem #6 backplane
  - g. The RIO interface in the base system to which the RIO cables are presently attached.
4. Reconnect the I/O subsystem power cables.
5. Turn on the power.
6. Boot AIX standalone diagnostics from CD.
7. If the "Please define the System Console" screen is displayed, follow directions to select the system console.
8. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
9. Check that all attached devices and adapters are listed.

**Did the "Please define the System Console" screen display and are all attached devices and adapters listed?**

**NO** Replace the next part in the list and return to the beginning of this step. Repeat this process until a part causes the "Please define the System Console" screen to be displayed and all adapters and attached devices to be listed. If you have replaced all the items listed above and the "Please define the System Console" screen does not display or all attached devices and adapters are not listed, check all external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

**YES** Go to PFW1542-22.

- **PFW1542-24**

The item you just replaced fixed the problem.

1. Turn off the power.
2. If a display adapter with keyboard and mouse were installed, reinstall the display adapter, keyboard, and mouse.

3. Reconnect the tape drive (if previously installed) to the internal SCSI bus cable.
  4. Plug in all adapters that were previously removed but not reinstalled.
  5. Reconnect the I/O subsystem power cables that were previously disconnected.
- Return the system to its original condition. Go to Verify a repair.

- **PFW1542-25**

1. Turn off the power.
2. At the base system, reconnect the cable connection at RIO port 0 recorded in PFW1542-7.
3. At the base system, reconnect the cable connection at RIO port 1 recorded in PFW1542-7.
4. Reconnect the power cables to the I/O subsystems that were found attached to the base system RIO ports mentioned in step 2 and step 3 of PFW1542-25. All I/O subsystems that were attached to the base system RIO port 0 and RIO port 1 should now be reconnected to the base system.
5. Make sure the I/O subsystem(s) are cabled correctly. See the cabling information for your I/O subsystem.
6. Turn on the power to boot AIX standalone diagnostics from CD-ROM.
7. If the "Please define the System Console" screen is displayed, follow the directions to select the system console.
8. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Did the "Please define the System Console" screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-9 to isolate a problem in an I/O subsystem attached to the base system RIO bus on the system backplane.

**YES** Go to PFW1542-26.

- **PFW1542-26**

**Is there a second RIO/12X in the base system, and if so, is there at least one I/O subsystem attached to it?**

**NO** Go to PFW1542-29.

**YES** Continue to PFW1542-27.

- **PFW1542-27**

1. Turn off the power.
2. At the base system, reconnect the cable connection at RIO port 0 on the second RIO/12X controller recorded in PFW1542-7.
3. At the base system, reconnect the cable connection at RIO port 1 on the second RIO/12X controller recorded in PFW1542-7.
4. Reconnect the power cables to the I/O subsystems that were attached to the second ports mentioned in substeps 2 and 3 in this step. All I/O subsystems that were attached to RIO port 0 on the second RIO/12X controller and RIO port 1 on the second RIO/12X controller in the base system should now be reconnected to the system.
5. Make sure that the I/O subsystem(s) are cabled correctly as shown in the cabling information for your I/O expansion unit.
6. Turn on the power to boot the AIX standalone diagnostic CD-ROM.
7. If the Please define the system console screen is displayed, follow the directions to select the system console.
8. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
9. Verify that all adapters and attached devices are listed.

**Did the "Please define the system console" screen display and are all adapters and attached devices listed?**

**NO** Go to PFW1542-28 to isolate the problems in the I/O subsystems that are attached to the second RIO expansion card or GX adapter in the base system.

**YES** Go to PFW1542-29.

• **PFW1542-28**

At the base system, reconnect the second I/O subsystem to the RIO ports on the base system's RIO expansion cards or GX adapters

The RIO ports on these subsystems are shown in the following table. Use this table to determine the physical location codes of the RIO connectors that are mentioned in the remainder of this MAP.

**Note:** The order in which the RIO or GX+ adapters are listed is the order in which the adapters are used for attaching external I/O boxes. The first adapter listed for the system units (models E4A, E8A, and MMA) should be used in step PFW1548-2. The second adapter listed should be used in step PFW1548-7.

Table 78. RIO ports location table

RIO Port	8203-E4A, 9407-M15, or 9408-M25 (base system)	8204-E8A or 9409-M50 (base system)	8234-EMA, 9117-MMA, 9406-MMA (base system drawer)	5088	5094	7311-D11	7314-G30 or 5796	7311-D20 or 5095
RIO port 0	Un-P1-C8-T2  Un-P1-C6-T2	Un-P1-C8-T2  Un-P1-C6-T2	Un-P1-C8-T2  (and U1-P1-C9-T2 if present)	Un-CB1-C10-00	Un-CB1-C08-00	Un-P1-C7-T1 (top connector)	Un-P1-C7-T2	Un-P1-C05-00  or Un-P1-C05-T2 (bottom connector)
RIO port 1	Un-P1-C8-T1  Un-P1-C6-T1	Un-P1-C8-T1  Un-P1-C6-T1	Un-P1-C8-T1  (and U1-P1-C9-T1 if present)	Un-CB1-C10-01	Un-CB1-C08-01	Un-P1-C7-T2	Un-P1-C7-T1	Un-P1-C05-01  or Un-P1-C05-T1 (top connector)

**Note:** Before continuing, check the cabling from the base system to the I/O subsystem(s) to ensure that the system is cabled correctly. Record the current cabling configuration and then continue with the following steps.

1. Turn off the power. Record the location and machine type and model number, or feature number, of each I/O drawer or tower. In the following steps, use this information to determine the physical location codes of the RIO connectors that are referred to by their logical names. For example, if I/O subsystem #1 is a 7311/D20 drawer, RIO port 0 is Un-P1-C05-T2.
2. At the base system, disconnect the cable connection at RIO port 0.
3. At the other end of the RIO cable referred to in step 2 of PFW1542-28, disconnect the I/O subsystem port connector 0. The RIO cable that was connected to RIO port 0 on the expansion card should now be loose; remove it. Record the location of this I/O subsystem and call it "subsystem #1".
4. Examine the connection at the I/O port connector 1 of the I/O subsystem recorded in step 3 of PFW1542-28. If the RIO cable attached to I/O port connector 1 connects to the I/O port connector

- 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #1, then go to step 8 of PFW1542-28.
5. At the base system, disconnect the cable connection at RIO port 1 and reconnect it to RIO port 0.
  6. At the I/O subsystem recorded in step 3 of PFW1542-28, disconnect the I/O port connector 1 and reconnect to I/O port 0.
  7. Verify that a single RIO cable connects base system RIO port 0 to the I/O subsystem recorded in step 4 of PFW1542-28 port 0. Go to step 28 of PFW1542-28.
  8. Record the location of the next I/O subsystem and call it "subsystem #2". This is the I/O subsystem that is connected to I/O port 1 of subsystem #1.
  9. Examine the connection at the I/O port 1 of subsystem #2 recorded in step 8 of PFW1542-28. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #2 and call it "subsystem #3". Go to step 13 of PFW1542-28.
  10. The RIO cable attached to the I/O port 1 of subsystem #2 is attached to port 1 of the base system. At the base system, disconnect the cable connection at RIO port 1 and reconnect it to RIO port 0.
  11. On subsystem #2, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
  12. Verify that a single RIO cable connects base system RIO port 0 to two I/O subsystems. Go to step 28 of PFW1542-28.
  13. Examine the connection at the I/O port 1 of subsystem #3 recorded in step 9 of PFW1542-28. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of the subsystem #3 and call it "subsystem #4". Go to step 17 of PFW1542-28.
  14. The RIO cable attached to the I/O port 1 of subsystem #3 is attached to port 1 of the base system. At the base system, disconnect the cable connection at RIO port 1 and reconnect it to RIO port 0.
  15. On subsystem #3, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
  16. Verify that a single RIO cable connects base system RIO port 0 to three I/O subsystems. Go to step 28 of PFW1542-28.
  17. Examine the connection at the I/O port 1 of subsystem #4 recorded in step 13 of PFW1542-28. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #4 and call it "subsystem #5". Go to step 21 of PFW1542-28.
  18. The RIO cable attached to the I/O port 1 of subsystem #4 is attached to port 1 of the base system. At the base system, disconnect the cable connection at RIO port 1 and reconnect it to RIO port 0.
  19. On subsystem #4, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
  20. Verify that a single RIO cable connects base system RIO port 0 to four I/O subsystems. Go to step 27 of PFW1542-28.
  21. Examine the connection at the I/O port 1 of subsystem #5 recorded in step 17 of PFW1542-28. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of the subsystem #5 and call it "subsystem #6". Go to step 25 of PFW1542-28.
  22. The RIO cable attached to the I/O port 1 of subsystem #5 is attached to port 1 of the base system. At the base system, disconnect the cable connection at RIO port 1 and reconnect it to RIO port 0.
  23. On subsystem #5, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
  24. Verify that a single RIO cable connects base system RIO port 0 to five I/O subsystems. Go to step 28 of PFW1542-28.
  25. The RIO cable attached to the I/O port 1 of subsystem #6 is attached to port 1 of the base system. At the base system, disconnect the cable connection at RIO port 1 and reconnect it to RIO port 0.

26. On subsystem #6, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
27. Verify that a single RIO cable connects base system RIO port 0 to six I/O subsystems. Go to step 28 of PFW1542-28.
28. Turn on the power to boot the AIX standalone diagnostics from CD-ROM.
29. If the "Please define the system console" screen is displayed, follow the directions to select the system console.
30. Use the option **Display Configuration and Resource List** to list all of the attached devices and adapters.
31. Verify that all adapters and the attached devices are listed.

**Did the "Please define the system console" screen display and are all adapters and attached devices listed?**

**NO** Go to PFW1542-9.

**YES** The RIO cable that was removed in step 3 above is defective. Replace this RIO cable.

- If six I/O subsystems are chained to RIO port 0 of the base system, connect the new RIO cable from subsystem #6 I/O port 1 to base system RIO port 1.
- If five I/O subsystems are chained to RIO port 0 of the base system, connect the new RIO cable from subsystem #5 I/O port 1 to base system RIO port 1.
- If four I/O subsystems are chained to RIO port 0 of the base system, connect the new RIO cable from subsystem #4 I/O port 1 to base system RIO port 1.
- If three I/O subsystems are chained to RIO port 0 of the base system, connect the new RIO cable from subsystem #3 I/O port 1 to base system RIO port 1.
- If two I/O subsystems are chained to RIO port 0 of the base system, connect the new RIO cable from subsystem #2 I/O port 1 to base system RIO port 1.
- If one I/O subsystem is chained to RIO port 0 of the base system, connect the new RIO cable from subsystem #1 I/O port 1 to base system RIO port 1.

Restore the system back to its original configuration. Go to Verify a repair.

• **PFW1542-29**

**Are there any adapters in the PCI slots in the base system?**

**NO** Go to PFW1542-30.

**YES** Go to PFW1542-32.

• **PFW1542-30**

Replace the system backplane, Un-P1. Continue to PFW1542-31.

• **PFW1542-31**

1. Boot AIX standalone diagnostics from CD.
2. If the "Please define the System Console" screen is displayed, follow directions to select the system console.
3. Use the Display Configuration and Resource List to list all adapters and attached devices.
4. Check that all adapters and attached devices are listed.

**Did the "Please define the System Console" screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-35.

**YES** Go to PFW1542-24.

• **PFW1542-32**

1. If it is not already off, turn off the power.
2. Label and record the location of any cables attached to the adapters.

3. Record the slot number of the adapters.
4. Remove all adapters from slots 1, 2, 3, 4, 5, and 6 in the base system that are not attached to the boot device.
5. Turn on the power to boot AIX standalone diagnostics from CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 key on the ASCII terminal's keyboard.
7. If the "Please define the System Console" screen is displayed, follow directions to select the system console.
8. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Did the "Please define the System Console" screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-35.

**YES** Continue to PFW1542-33.

- **PFW1542-33**

If the "Please define the System Console" screen does display and all adapters and attached devices are listed, the problem is with one of the adapters or devices that was removed or disconnected from the base system.

1. Turn off the power.
2. Reinstall one adapter and device that was removed. Use the original adapters in their original slots when reinstalling adapters.
3. Turn on the power to boot AIX standalone diagnostics from the optical drive.
4. If the "Please define the System Console" screen is displayed, follow the directions to select the system console.
5. Use the Display Configuration and Resource List to list all adapters and attached devices.
6. Check that all adapters and attached devices are listed.

**Did the "Please define the System Console" screen display and are all attached devices and adapters listed?**

**NO** Continue to PFW1542-34.

**YES** Return to the beginning of this step to continue reinstalling adapters and devices.

- **PFW1542-34**

Replace the adapter you just installed with a new adapter and retry the boot to AIX standalone diagnostics from CD-ROM.

1. If the "Please Define the System Console" screen is displayed, follow directions to select the system console.
2. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
3. Check that all adapters and attached devices are listed.

**Did the "Please define the System Console" screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-30.

**YES** The adapter you just replaced was defective. Go to PFW1542-24.

- **PFW1542-35**

1. Turn off the power.
2. Disconnect the base system power cables.
3. Replace the following parts, one at a time, in the sequence listed:
  - a. Optical drive

- b. Removable media backplane and cage assembly
  - c. Disk drive backplane and cage assembly
  - d. I/O backplane, location Un-P1
  - e. Service processor
4. Reconnect the base system power cables.
  5. Turn on the power.
  6. Boot AIX standalone diagnostics from CD.
  7. If the "Please define the System Console" screen is displayed, follow directions to select the system console.
  8. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
  9. Check that all adapters and attached devices are listed.

**Did the "Please define the System Console" screen display and are all adapters and attached devices listed?**

**NO** Replace the next part in the list and return to the beginning of this step. Repeat this process until a part causes the Please define the System Console screen to be displayed and all adapters and attached devices to be listed. If you have replaced all the items listed above and the Please define the System Console screen does not display or all adapters and attached devices are not listed, check all external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

**YES** Go to PFW1542-24.

## **PFW1548: Memory and processor subsystem problem isolation procedure**

Use this problem isolation procedure to aid in solving memory and processor problems that are not found by normal diagnostics.

### **Notes:**

1. To avoid damage to the system or subsystem components, unplug the power cords before removing or installing any part.
2. This procedure assumes that either:
  - An optical drive is installed and connected to the integrated EIDE adapter, and an AIX diagnostic CD-ROM is available.
  - OR
  - AIX standalone diagnostics can be booted from a NIM server.
3. If a power-on password or privileged-access password is set, you are prompted to enter the password before the AIX diagnostic CD-ROM can load.
4. The term POST indicators refers to the device mnemonics that appear during the power-on self-test (POST).
5. The service processor might have been set by the user to monitor system operations and to attempt recoveries. You might want to disable these options while you diagnose and service the system. If these settings are disabled, make notes of their current settings so that they can be restored before the system is turned back over to the customer. The following settings may be of interest.

### **Monitoring**

(also called surveillance) From the ASMI menu, expand the **System Configuration** menu, then click **Monitoring**. Disable both types of surveillance.

### **Auto power restart**

(also called unattended start mode) From the ASMI menu, expand **Power/Restart Control**, then click **Auto Power Restart**, and set it to disabled.

## Wake on LAN

From the ASMI menu, expand **Wake on LAN**, and set it to disabled.

## Call Out

From the ASMI menu, expand the **Service Aids** menu, then click **Call-Home/Call-In Setup**. Set the call-home system port and the call-in system port to disabled.

6. Verify that the system has not been set to boot to the System Management Services (SMS) menus or to the open firmware prompt. From the ASMI menu, expand **Power/Restart Control** to view the menu, then click **Power On/Off System**. The AIX/Linux partition mode boot should say "Continue to Operating System".
7. The service processor might have recorded one or more symptoms in its error/event log. Use the Advanced System Management Interface (ASMI) menus to view the error/event log.
  - If you arrived here after performing a slow boot, look for a possible new error that occurred during the slow boot. If there is a new error, and its actions call for a FRU replacement, perform those actions. If this does not resolve the problem, go to PFW1548-1.
  - If an additional slow boot has not been performed, or if the slow boot did not yield a new error code, look at the error that occurred just before the original error. Perform the actions associated with that error. If this does not resolve the problem, go to PFW1548-1.
  - If a slow boot results in the same error code, and there are no error codes before the original error code, go to PFW1548-1.

Perform the following procedure:

### • PFW1548-1

1. Ensure that the diagnostics and the operating system are shut down.

**Is the system at "service processor standby", indicated by 01 in the control panel?**

**NO** Replace the system backplane, location: Un-P1. Return to the beginning of this step.

**YES** Continue with substep 2.

2. Turn on the power using either the white button or the ASMI menus.

**If an HMC is attached, does the system reach hypervisor standby as indicated on the HMC? If an HMC is not attached, does the system reach an operating system login prompt, or if booting the AIX standalone diagnostic CD-ROM, is the  $\triangle$ Please define the System Console $\triangle$  screen displayed?**

**NO** Go to PFW1548-3.

**YES** Go to PFW1548-2.

3. Insert the AIX standalone diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the diagnostic CD-ROM, go to PFW1548-2.

4. When the word keyboard is displayed on an ASCII terminal, a directly attached keyboard, or hardware management console (HMC), press the number 5 key.
5. If you are prompted to do so, enter the appropriate password.

**Is the "Please define the System Console" screen displayed?**

**NO** Go to PFW1548-2.

**YES** Go to PFW1548-14.

### • PFW1548-2

Insert the AIX standalone diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the AIX standalone diagnostic CD-ROM, go to step PFW1548-3.

Turn on the power using either the white button or the ASMI menus. (If the AIX standalone diagnostic CD-ROM is not in the optical drive, insert it now.) If an HMC is attached, after the system has reached

hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the AIX standalone diagnostic CD-ROM.

If you are prompted to do so, enter the appropriate password.

**Is the "Please define the System Console" screen displayed?**

**NO** Go to PFW1548-3.

**YES** Go to PFW1548-14.

- **PFW1548-3**

1. Turn off the power.
2. If you have not already done so, configure the service processor (using the ASMI menus) with the instructions in note 6 at the beginning of this procedure, then return here and continue.
3. Exit the service processor (ASMI) menus and remove the power cords.
4. Disconnect all external cables (parallel, system port 1, system port 2, keyboard, mouse, USB devices, SPCN, Ethernet on the system planar, and so on). Also disconnect all of the external cables attached to the service processor except the Ethernet cable going to the HMC, if an HMC is attached.
5. Is the system an 8234-EMA, 9117-MMA, or 9406-MMA and is there more than one processor drawer in the system?

**NO:** Go to PFW1548-4.

**YES:** Go to PFW1548-3.1 .

Go to the next step.

- **PFW1548-3.1**

Disconnect the flex cables from the front and the back of all the processor drawers if not already disconnected. Does the processor drawer with the service processor card power on OK?

**NO:** Go to the next step.

**YES** Go to PFW1548-13.2

- **PFW1548-4**

Using the following table, locate the system machine type and model you are servicing and determine the action to perform.

8203-E4A, 9407-M15, and 9408-M25	8204-E8A and 9409-M50	8234-EMA, 9117-MMA, and 9406-MMA
<ol style="list-style-type: none"> <li>1. If this is a deskside system, remove the service access cover. If this is a rack-mounted system, place the drawer into the service position and remove the service access cover. Also remove the front cover.</li> <li>2. Record the slot numbers of the PCI adapters and I/O expansion cards if present. Label and record the locations of all cables attached to the adapters. Disconnect all cables attached to the adapters and remove all of the adapters.</li> <li>3. Remove the removable media/disk drive enclosure assembly by pulling out the blue tabs at the bottom of the enclosure, then sliding the enclosure out approximately three centimeters.</li> <li>4. Remove and label the disk drives from the media/disk drive enclosure assembly.</li> <li>5. Remove one of the two memory DIMMs quads. <b>Notes:</b> <ol style="list-style-type: none"> <li>a. Place the memory DIMM locking tabs in the locked (upright) position to prevent damage to the tabs.</li> <li>b. Memory DIMMs must be installed in quads and in the correct connectors. Refer to System FRU locations for information on memory DIMMs.</li> </ol> </li> <li>6. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.</li> <li>7. Turn on the power using either the HMC or the white button.</li> </ol>	<ol style="list-style-type: none"> <li>1. If this is a deskside system, remove the service access cover. If this is a rack-mounted system, place the drawer into the service position and remove the service access cover. Also remove the front cover.</li> <li>2. Record the slot numbers of the PCI adapters and I/O expansion cards if present. Label and record the locations of all cables attached to the adapters. Disconnect all cables attached to the adapters and remove all of the adapters.</li> <li>3. Remove the removable media/disk drive enclosure assembly by pulling out the blue tabs at the bottom of the enclosure, then sliding the enclosure out approximately three centimeters.</li> <li>4. Remove and label the disk drives from the media/disk drive enclosure assembly.</li> <li>5. Remove processor cards #2, #3, and #4 (if installed). If processor cards #2, #3, and #4 are removed, ensure that processor card #1 is installed and has at least one quad of DIMMs.</li> <li>6. Record the slot numbers of the memory DIMMs on processor card #1. Remove all memory DIMMs except for one quad from processor card #1. <b>Note:</b> <ol style="list-style-type: none"> <li>a. Place the memory DIMM locking tabs in the locked (upright) position to prevent damage to the tabs.</li> <li>b. Memory DIMMs must be installed in quads and in the correct connectors. Refer to System FRU locations for information on memory DIMMs locations.</li> </ol> </li> <li>7. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.</li> <li>8. Turn on the power using either the HMC or the white button.</li> </ol>	<ol style="list-style-type: none"> <li>1. Place the drawer into the service position and remove the service access cover.</li> <li>2. Record the slot numbers of the PCI adapters and I/O expansion cards if present. Label and record the locations of all cables attached to the adapters. Disconnect all cables attached to the adapters and remove all of the adapters.</li> <li>3. Remove the removable media enclosure assembly by pulling out the orange tabs and then sliding the media enclosure toward you approximately three centimeters.</li> <li>4. Remove processor card #2 (if installed). If processor card #2 is removed, insure that processor card #1 is installed and contains at least one quad of DIMMs.</li> <li>5. Record the slot numbers of the memory DIMMs on processor card #1. Remove all memory DIMMs except for one quad from processor card #1. <b>Note:</b> <ol style="list-style-type: none"> <li>a. Place the memory DIMM locking tabs in the locked (upright) position to prevent damage to the tabs.</li> <li>b. Memory DIMMs must be installed in quads and in the correct connectors. Refer to System FRU locations for information on memory DIMMs locations.</li> </ol> </li> <li>6. Remove the disk drives from the disk drive enclosure assembly.</li> <li>7. Release and disconnect the disk drive enclosure assembly by using the cam levers at the lower front part of the enclosure.</li> <li>8. Plug in the power cords and wait for 01 in the upper-left-hand corner of the control panel display.</li> <li>9. Turn on the power using either the HMC or the white button.</li> </ol>

**If an HMC is attached, does the managed system reach power on at hypervisor standby as indicated on the HMC? If an HMC is not attached, does the system reach an operating system login prompt, or if booting the AIX standalone diagnostic CD-ROM, is the  $\Delta$ Please define the System Console $\Delta$  screen displayed?**

**NO** Go to PFW1548-7.

**YES** Go to the next step.

- **PFW1548-5**

**For 8203-E4A, 9407-M15, and 9408-M25, were any memory DIMMs removed from system backplane?**

**For 8234-EMA, 9117-MMA, and 9406-MMA were any memory DIMMs removed from processor card #1?**

**NO** Go to PFW1548-8.

**YES** Go to the next step.

- **PFW1548-6**

1. Turn off the power, and remove the power cords.
2. For 8203-E4A, 9407-M15, and 9408-M25, replug the memory DIMMs that were removed from system backplane in PFW1548-2 in their original locations. For 8204-E8A and 9409-M50, 8234-EMA, 9117-MMA, or 9406-MMA, replug the memory DIMMs that were removed from processor card #1 in PFW1548-2 in their original locations.

**Notes:**

- a. Place the memory DIMM locking tabs into the locked (upright) position to prevent damage to the tabs.
  - b. Memory DIMMs must be installed in quads in the correct connectors. Refer to System FRU locations for information on memory DIMMs locations for the system that you are servicing.
3. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
  4. Turn on the power using either the HMC or the white button.

**If an HMC is attached, does the managed system reach power on at hypervisor standby as indicated on the HMC? If an HMC is not attached, does the system reach an operating system login prompt, or if booting the AIX diagnostic CD-ROM, is the  $\Delta$ Please define the System Console $\Delta$  screen displayed?**

**NO:** Using the following table, locate the system machine type and model you are servicing and determine the action to perform.

8203-E4A, 9407-M15, and 9408-M25	8204-E8A and 9409-M50	8234-EMA, 9117-MMA, and 9406-MMA
<p>A memory DIMM in the quad you just replaced in the system is defective. Turn off the power, remove the power cords, and exchange the memory DIMM quad with new or previously removed memory DIMM quad. Repeat this step until the defective memory DIMM quad is identified, or both memory DIMM quads have been exchanged.</p> <p>If your symptom did not change and both the memory DIMM quads have been exchanged, call your service support person for assistance.</p> <p>If the symptom changed, check for loose cards and obvious problems. If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.</p>	<p>A memory DIMM in the quad you just replaced in the system is defective. Turn off the power, remove the power cords, and exchange the memory DIMM quad with new or previously removed memory DIMM quad. Repeat this step until the defective memory DIMM quad is identified, or all memory DIMM quads have been exchanged.</p> <p>If your symptom did not change and all the memory DIMM quads have been exchanged, call your service support person for assistance. If the symptom changed, check for loose cards and obvious problems.</p> <p>If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.</p>	<p>A memory DIMM in the quad you just replaced in the system is defective. Turn off the power, remove the power cords, and exchange the memory DIMMs in that quad one at a time with new or previously removed memory DIMMs. Repeat this step until the defective memory DIMM is identified, or all memory DIMMs have been exchanged.</p> <p>If your symptom did not change and all the memory DIMMs have been exchanged, call your service support person for assistance. If the symptom changed, check for loose cards and obvious problems.</p> <p>If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.</p>

**YES:** Using the following table, locate the system machine type and model you are servicing and determine the action to perform.

8203-E4A, 9407-M15, and 9408-M25	8204-E8A and 9409-M50	8234-EMA, 9117-MMA, and 9406-MMA
Go to PFW1548-8.	<p>Was one or more processor card(s) removed from the system (other than processor card #1 to remove DIMMs)?</p> <p><b>NO:</b> Go to PFW1548-8.</p> <p><b>YES:</b> Go to PFW1548-7.1.</p>	<p>Was processor card #2 removed from the system?</p> <p><b>NO:</b> Go to PFW1548-8.</p> <p><b>YES:</b> Go to PFW1548-7.1.</p>

- **PFW1548-7**

One of the FRUs remaining in the system unit is defective.

**Note:** If a memory DIMM is exchanged, ensure that the new memory DIMM is the same size and speed as the original memory DIMM.

1. Turn off the power and remove the power cords. Using the following table, locate the system machine type and model you are servicing and exchange the FRUs, one at a time, in the order listed.

8203-E4A, 9407-M15, and 9408-M25	8204-E8A and 9409-M50	8234-EMA, 9117-MMA, and 9406-MMA
<ol style="list-style-type: none"> <li>1. Memory DIMMs. Exchange one quad at a time with new or previously removed DIMM quads</li> <li>2. System backplane, location: Un-P1</li> <li>3. Power supplies, locations: Un-E1 and Un-E2.</li> </ol>	<ol style="list-style-type: none"> <li>1. Memory DIMMs. Exchange one quad at a time with new or previously removed DIMM quads</li> <li>2. Processor card #1, location: Un-P1-C13.</li> <li>3. System backplane, location: Un-P1</li> <li>4. Power supplies, locations: Un-E1 and Un-E2.</li> </ol>	<ol style="list-style-type: none"> <li>1. Memory DIMMs. Exchange one at a time with new or previously removed DIMMs</li> <li>2. Processor card #1, location: Un-P2-C1.</li> <li>3. Processor backplane, location: Un-P2</li> <li>4. Power supplies, locations: Un-E1 and Un-E2.</li> <li>5. Processor regulators, locations: Un-P2-C3, Un-P2-C4, Un-P2-C5.</li> <li>6. Service processor, location: Un-P1-C11.</li> <li>7. I/O backplane, location: Un-P1.</li> </ol>

2. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
3. Turn on the power using either the HMC or the white button.

**If an HMC is attached, does the managed system reach power on at hypervisor standby as indicated on the HMC? If an HMC is not attached, does the system reach an operating system login prompt, or if booting the AIX diagnostic CD-ROM, is the  $\Delta$ Please define the System Console $\Delta$  screen displayed?**

**NO** Reinstall the original FRU.

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.

**YES** Go to Verify a repair.

- **PFW1548-7.1**

Using the following table, locate the system machine type and model you are servicing and determine the action to perform.

8204-E8A, and 9409-M50	8234-EMA, 9117-MMA, and 9406-MMA
<p>No failure was detected with this configuration.</p> <ol style="list-style-type: none"> <li>1. Turn off the power and remove the power cords.</li> <li>2. Reinstall the next processor card.</li> <li>3. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.</li> <li>4. Turn on the power using either the HMC or the white button.</li> </ol> <p><b>If an HMC is attached, does the managed system reach power on at hypervisor standby as indicated on the HMC? If an HMC is not attached, does the system reach an operating system login prompt, or if booting the AIX diagnostic CD-ROM, is the <math>\Delta</math>Please define the System Console<math>\Delta</math> screen displayed?</b></p> <p><b>NO:</b> One of the FRUs remaining in the system is defective. Exchange the FRUs (that have not already been changed) in the following order:</p> <ol style="list-style-type: none"> <li>a. Memory DIMMs (if present) on processor card that was just reinstalled. Exchange the DIMM quads one at a time with new or previously removed DIMM quads.</li> <li>b. The processor card that was just reinstalled.</li> <li>c. System backplane, location: Un-P1.</li> <li>d. Power supplies, locations: Un-E1 and Un-E2.</li> </ol> <p>Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.</p> <p>If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.</p> <p>If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.</p> <p><b>YES:</b> If all of the processor cards been reinstalled, go to the next step. Otherwise, repeat this step.</p>	<p>No failure was detected with this configuration.</p> <ol style="list-style-type: none"> <li>1. Turn off the power and remove the power cords.</li> <li>2. Reinstall processor card #2.</li> <li>3. Plug in the power cords and wait for <math>\Delta</math>01<math>\Delta</math> in the upper-left corner of the control panel display.</li> <li>4. Turn on the power using either the HMC or the white button.</li> </ol> <p><b>If an HMC is attached, does the managed system reach power on at hypervisor standby as indicated on the HMC? If an HMC is not attached, does the system reach an operating system login prompt, or if booting the AIX diagnostic CD-ROM, is the <math>\Delta</math>Please define the System Console<math>\Delta</math> screen displayed?</b></p> <p><b>NO:</b> One of the FRUs remaining in the system is defective. Exchange the FRUs (that have not already been changed) in the following order:</p> <ol style="list-style-type: none"> <li>a. Memory DIMMs (if present) on processor card #2. Exchange the DIMMs one at a time with new or previously removed DIMMs.</li> <li>b. Processor card #2</li> <li>c. Processor backplane, location: Un-P2.</li> <li>d. Power supplies, locations: Un-E1 and Un-E2.</li> <li>e. Processor regulators, locations: Un-P2-C3, Un-P2-C4, Un-P2-C5.</li> <li>f. Service processor, location: Un-P1-C11.</li> <li>g. I/O backplane, location: Un-P1.</li> </ol> <p>Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.</p> <p>If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.</p> <p>If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.</p> <p><b>YES</b> Go to the next step.</p>

- **PFW1548-8**

1. Turn off the power.
2. Reconnect the system console.

**Notes:**

- a. If an ASCII terminal has been defined as the firmware console, attach the ASCII terminal cable to the S1 connector on the rear of the system unit.

- b. If a display attached to a display adapter has been defined as the firmware console, install the display adapter and connect the display to the adapter. Plug the keyboard and mouse into the keyboard connector on the rear of the system unit.
3. Turn on the power using either the HMC or the white button. (If the AIX standalone diagnostic CD-ROM is not in the optical drive, insert it now.) If an HMC is attached, after the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the AIX standalone diagnostic CD-ROM.
4. If the ASCII terminal or graphics display (including display adapter) is connected differently from the way it was previously, the console selection screen appears. Select a firmware console.
5. Immediately after the word keyboard is displayed, press the number 1 key on the directly attached keyboard, an ASCII terminal or HMC. This activates the system management services (SMS).
6. Enter the appropriate password if you are prompted to do so.

**Is the SMS screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. If you are using an ASCII terminal, go to the problem determination procedures for the display. If you do not find a problem, do the following:

8203-E4A, 9407-M15, 9408-M25, 8204-E8A, and 9409-M50	8234-EMA, 9117-MMA, and 9406-MMA
Replace the system backplane, location: Un-P1.	<ol style="list-style-type: none"> <li>1. Replace the service processor, location: Un-P1-C11.</li> <li>2. Replace the I/O backplane, location: Un-P1.</li> </ol>

2. If you are using a graphics display, go to the problem determination procedures for the display. If you do not find a problem, do the following:

- a. Replace the display adapter.
- b. Replace the backplane in which the graphics adapter is plugged.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.

**YES** Go to the next step.

• **PFW1548-9**

1. Make sure the AIX standalone diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Use the cam levers to reconnect the disk drive enclosure assembly to the I/O backplane.
4. Using the following table, locate the system machine type and model you are servicing and determine the action to perform.

8203-E4A, 9407-M15, 9408-M25 8204-E8A, and 9409-M50	8234-EMA, 9117-MMA, and 9406-MMA
Reconnect the removable media/disk drive enclosure assembly by sliding the media enclosure toward the rear of the system, then pressing the blue tabs.	Reconnect the removable media enclosure assembly by sliding the media enclosure toward the disk drive backplane and then pressing the orange tabs.

5. Plug in the power cords and wait for 01 in the upper-left corner of the operator panel display.

6. Turn on the power using either the HMC or the white button. (If the AIX standalone diagnostic CD-ROM is not in the optical drive, insert it now.) If an HMC is attached, after the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the AIX standalone diagnostic CD-ROM.
7. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO:** One of the FRUs remaining in the system unit is defective.

Using the following table, locate the system machine type and model you are servicing and exchange the FRUs in the order listed that have not been exchanged.

8203-E4A, 9407-M15, 9408-M25 8204-E8A, and 9409-M50	8234-EMA, 9117-MMA, and 9406-MMA
<ol style="list-style-type: none"> <li>1. Optical drive</li> <li>2. Removable media enclosure.</li> <li>3. System backplane, Un-P1.</li> </ol>	<ol style="list-style-type: none"> <li>1. Optical drive</li> <li>2. Removable media enclosure.</li> <li>3. Disk drive enclosure (no disk drives at this time)</li> <li>4. I/O backplane, Un-P1.</li> </ol>

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.

**YES:** Go to the next step.

• **PFW1548-10**

The system is working correctly with this configuration. One of the disk drives that you removed from the disk drive backplanes may be defective.

1. Make sure the AIX standalone diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Using the following table, locate the system machine type and model you are servicing and determine the action to perform.

8203-E4A, 9407-M15, 9408-M25, 8204-E8A, and 9409-M50	8234-EMA, 9117-MMA, and 9406-MMA
Install a disk drive in the media/disk drive enclosure assembly.	Install a disk drive in the disk drive enclosure assembly.

4. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
5. Turn on the power.
6. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO** Using the following table, locate the system machine type and model you are servicing and exchange the FRUs in the order listed that have not been exchanged.

8203-E4A, 9407-M15, 9408-M25, 8204-E8A, and 9409-M50	8234-EMA, 9117-MMA, and 9406-MMA
<ol style="list-style-type: none"> <li>1. Last disk drive installed</li> <li>2. Disk drive backplane.</li> </ol>	<ol style="list-style-type: none"> <li>1. Last disk drive installed</li> <li>2. Disk drive enclosure assembly.</li> </ol>

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.

**YES** Repeat this step with all disk drives that were installed in the disk drive backplane.

After all of the disk drives have been reinstalled, go to the next step.

• **PFW1548-11**

The system is working correctly with this configuration. One of the devices that was disconnected from the system backplane may be defective.

1. Turn off the power and remove the power cords.
2. Attach a system backplane device (for example: system port 1, system port 2, USB, keyboard, mouse, Ethernet) that had been removed.

After all of the I/O backplane device cables have been reattached, reattached the cables to the service processor one at a time.

3. Plug in the power cords and wait for 01 in the upper-left corner on the operator panel display.
4. Turn on the power using either the HMC or the white button. (If the AIX standalone diagnostic CD-ROM is not in the optical drive, insert it now.) If an HMC is attached, after the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the AIX standalone diagnostic CD-ROM.
5. If the Console Selection screen is displayed, choose the system console.
6. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO** The last device or cable that you attached is defective.

To test each FRU, use the following table to locate the system machine type and model you are servicing, then exchange the FRUs in the order listed.

8203-E4A, 9407-M15, 9408-M25, 8204-E8A, and 9409-M50	8234-EMA, 9117-MMA, and 9406-MMA
<ol style="list-style-type: none"> <li>1. Device and cable (last one attached)</li> <li>2. System backplane, location: Un-P1.</li> </ol>	<ol style="list-style-type: none"> <li>1. Device and cable (last one attached)</li> <li>2. If the last cable in this step was reconnected to the service processor, replace the service processor.</li> <li>3. I/O backplane, location: Un-P1.</li> </ol>

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.

**YES** Repeat this step until all of the devices are attached. Go to the next step.

• **PFW1548-12**

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed may be defective.

1. Turn off the power and remove the power cords.
2. Install a FRU (adapter) and connect any cables and devices that were attached to the FRU.
3. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
4. Turn on the power using either the HMC or the white button. (If the AIX standalone diagnostic CD-ROM is not in the optical drive, insert it now.) If an HMC is attached, after the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the AIX standalone diagnostic CD-ROM.
5. If the Console Selection screen is displayed, choose the system console.
6. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO** Go to the next step.

**YES** Repeat this step until all of the FRUs (adapters) are installed. Go to Verify a repair.

• **PFW1548-13**

The last FRU installed or one of its attached devices is probably defective.

1. Make sure the AIX standalone diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Plug in the power cords and wait for the 01 in the upper-left corner on the operator panel display.
5. Turn on the power using either the HMC or the white button. (If the AIX standalone diagnostic CD-ROM is not in the optical drive, insert it now.) If an HMC is attached, after the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the Advanced activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the AIX standalone diagnostic CD-ROM.
6. If the Console Selection screen is displayed, choose the system console.
7. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO** Repeat this step until the defective device or cable is identified or all devices and cables have been disconnected.

If all the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.

To test each FRU, use the following table to locate the system machine type and model you are servicing, then exchange the FRUs in the order listed.

8203-E4A, 9407-M15, 9408-M25, 8204-E8A, and 9409-M50	8234-EMA, 9117-MMA, and 9406-MMA
1. Adapter (last one installed)	1. Adapter (last one installed)
2. System backplane, location: Un-P1.	2. I/O backplane, location: Un-P1.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis and follow the instructions for the new symptom.

**YES** The last device or cable that you disconnected is defective. Exchange the defective device or cable then go to the next step.

- **PFW1548-13.1**

**Is the system an 8234-EMA, 9117-MMA, or 9406-MMA?**

**NO:** Go to PFW1548-14.

**YES:** Go to the next step.

- **PFW1548-13.2**

Reattach the flex cables, if present, both front and back. Return the system to its original configuration. Reinstall the control panel, the VPC card, and the service processor in the original primary processor drawer. Reattach the power cords and power on the system.

**Does the system come up properly?**

**NO:** Go to the next step.

**YES:** Go to Verify a repair..

- **PFW1548-13.3**

**Have all of the drawers been tested individually with the physical control panel (if present), service processor, and VPD card?**

**NO:**

1. Detach the flex cables from the front and back of the system if not already disconnected.
2. Remove the service processor card, the VPD card, and the control panel from the processor drawer that was just tested.
3. Install these parts in the next drawer in the rack, going top to bottom.
4. Go to PFW1548-3.

**YES:** Reinstall the control panel, the VPD card, and the service processor card in the original primary processor drawer. Return the system to its original configuration. Suspect a problem with the flex cables. If the error code indicates a problem with the SPCN or service processor communication between drawers, replace the flex cable in the rear. If the error code indicates a problem with inter-processor drawer communication, replace the flex cable on the front of the system. Continue with the next step.

- **PFW1548-13.4**

**Did replacing the flex cable(s) resolve the problem?**

**NO:** Go to step the next step.

**YES:** The problem is resolved. Go to Verify a repair.

- **PFW1548-13.5**

Replacing the flex cables did not resolve the problem. If the problem appears to be with the service processor or SPCN signals, suspect the I/O backplanes. If the problem appears to be with processor communication, suspect the processor cards. Replace the I/O backplanes, or processor cards, one at a time until the defective part is found.

**Did this resolve the problem?**

**NO:** Contact your next level of support.

**YES:** The problem is resolved. Go to Verify a repair.

- **PFW1548-14**

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.

3. Select **Advanced Diagnostics Routines**.
4. If the terminal type has not been defined, you must use the option **Initialize Terminal** on the FUNCTION SELECTION menu to initialize the AIX diagnostic environment before you can continue with the diagnostics. This is a separate operation from selecting the console display.
5. If the NEW RESOURCE screen is displayed, select an option from the bottom of the screen.

**Note:** Adapters and devices that require supplemental media are not shown in the new resource list. If the system has adapters or devices that require supplemental media, select option 1.

6. When the DIAGNOSTIC MODE SELECTION screen is displayed, press Enter.
7. Select **All Resources**. (If you were sent here from step PFW1548-18, select the adapter or device that was loaded from the supplemental media).

**Did you get an SRN?**

**NO** Go to step PFW1548-16.

**YES** Go to the next step.

- **PFW1548-15**

Look at the FRU part numbers associated with the SRN.

**Have you exchanged all the FRUs that correspond to the failing function codes (FFCs)?**

**NO** Exchange the FRU with the highest failure percentage that has not been changed.

Repeat this step until all the FRUs associated with the SRN have been exchanged or diagnostics run with no trouble found. Run diagnostics after each FRU is exchanged. Go to Verify a repair.

**YES** If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

- **PFW1548-16**

**Does the system have adapters or devices that require supplemental media?**

**NO** Go to step the next step.

**YES** Go to step PFW1548-18.

- **PFW1548-17**

Consult the PCI adapter configuration documentation for your operating system to verify that all adapters are configured correctly.

Go to Verify a repair.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

- **PFW1548-18**

1. Select **Task Selection**.

2. Select **Process Supplemental Media** and follow the on-screen instructions to process the media. Supplemental media must be loaded and processed one at a time.

**Did the system return to the TASKS SELECTION SCREEN after the supplemental media was processed?**

**NO** Go to the next step.

**YES** Press F3 to return to the FUNCTION SELECTION screen. Go to step PFW1548-14 substep 4.

- **PFW1548-19**

The adapter or device is probably defective.

If the supplemental media is for an adapter, replace the FRUs in the following order:

1. Adapter
2. System backplane, location: Un-P1.

If the supplemental media is for a device, replace the FRUs in the following order:

8203-E4A, 9407-M15, 9408-M25, 8204-E8A, and 9409-M50	8234-EMA, 9117-MMA, and 9406-MMA
1. Device and any associated cables 2. The adapter to which the device is attached	1. Adapter 2. I/O backplane, location: UN-P1.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.

Go to Verify a repair.

**End of procedure.**

### **PFW1548: Memory and processor subsystem problem isolation procedure when an HMC is attached**

This procedure is used to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU 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.

**Note:** the system backplane has two memory DIMM quads: Un-P1-C14 to Un-P1-C17, and Un-P1-C21 to Un-P1-C24. See System FRU locations for information on system FRU locations.

Perform the following procedure:

- **PFW1548-1**

1. Ensure that the diagnostics and the operating system are shut down.

**Is the system at "service processor standby", indicated by 01 in the control panel?**

**NO** Replace the system backplane, location: Un-P1. Return to step PFW1548-1.

**YES** Continue with substep 2.

2. Turn on the power using either the white button or the ASMI menus.

**Does the system reach hypervisor standby as indicated on the HMC?**

**NO** Go to PFW1548-3.

**YES** Go to PFW1548-2.

3. Insert the AIX diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the diagnostic CD-ROM, go to PFW1548-2.

4. When the word keyboard is displayed on an ASCII terminal, a directly attached keyboard, or hardware management console (HMC), press the number 5 key.

5. If you are prompted to do so, enter the appropriate password.

**Is the "Please define the System Console" screen displayed?**

**NO** Go to PFW1548-2.

**YES** Go to PFW1548-14.

- **PFW1548-2**

Insert the AIX diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the diagnostic CD-ROM, go to step PFW1548-3.

Turn on the power using either the white button or the ASMI menus. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the diagnostic CD-ROM.

If you are prompted to do so, enter the appropriate password.

**Is the "Please define the System Console" screen displayed?**

**NO** Go to PFW1548-3.

**YES** Go to PFW1548-14.

• **PFW1548-3**

1. Turn off the power.
2. If you have not already done so, configure the service processor (using the ASMI menus), follow the instructions in note 6 located in "PFW1548: Memory and processor subsystem problem isolation procedure" on page 364 and then return here and continue.
3. Exit the service processor (ASMI) menus and remove the power cords.
4. Disconnect all external cables (parallel, system port 1, system port 2, keyboard, mouse, USB devices, SPCN, Ethernet on the system planar, and so on). Also disconnect all of the external cables attached to the service processor except the Ethernet cable going to the HMC.

Go to the next step.

• **PFW1548-4**

1. If this is a desktside system, remove the service access cover. If this is a rack-mounted system, place the drawer into the service position and remove the service access cover. Also remove the front cover.
2. Record the slot numbers of the PCI adapters and I/O expansion cards if present. Label and record the locations of all cables attached to the adapters. Disconnect all cables attached to the adapters and remove all of the adapters.
3. Remove the removable media/disk drive enclosure assembly by pulling out the blue tabs at the bottom of the enclosure, then sliding the enclosure out approximately three centimeters.
4. Remove and label the disk drives from the media/disk drive enclosure assembly.
5. Remove one of the two memory DIMMs quads.

**Notes:**

- a. Place the memory DIMM locking tabs in the locked (upright) position to prevent damage to the tabs.
  - b. Memory DIMMs must be installed in quads and in the correct connectors. Refer to System FRU locations for information on memory DIMMs locations.
6. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
  7. Turn on the power using either the HMC or the white button.

**Does the managed system reach power on at hypervisor standby as indicated on the HMC?**

**NO** Go to PFW1548-7.

**YES** Go to the next step.

• **PFW1548-5**

**Were any memory DIMMs removed from system backplane?**

**NO** Go to PFW1548-8.

**YES** Go to the next step.

• **PFW1548-6**

1. Turn off the power, and remove the power cords.

2. Replug the memory DIMMs that were removed from system backplane in PFW1548-2 in their original locations.

**Notes:**

- a. Place the memory DIMM locking tabs into the locked (upright) position to prevent damage to the tabs.
  - b. Memory DIMMs must be installed in quads in the correct connectors. Refer to System FRU locations for information on memory DIMM locations..
3. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
  4. Turn on the power using either the HMC or the white button.

**Does the managed system reach power on at hypervisor standby as indicated on the HMC?**

**NO** A memory DIMM in the quad you just replaced in the system is defective. Turn off the power, remove the power cords, and exchange the memory DIMM quad with new or previously removed memory DIMM quad. Repeat this step until the defective memory DIMM quad is identified, or both memory DIMM quads have been exchanged.

**Note:** the system backplane has two memory DIMM quads:  $Un-P1-C1x-C1$  to  $Un-P1-C1x-C4$ , and  $Un-P1-C1x-C6$  to  $Un-P1-C1x-C9$ . See System FRU locations.

If your symptom did not change and both the memory DIMM quads have been exchanged, call your service support person for assistance.

If the symptom changed, check for loose cards and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**YES** Go to the next step.

• **PFW1548-7**

One of the FRUs remaining in the system unit is defective.

**Note:** If a memory DIMM is exchanged, ensure that the new memory DIMM is the same size and speed as the original memory DIMM.

1. Turn off the power, remove the power cords, and exchange the following FRUs, one at a time, in the order listed:
  - a. Memory DIMMs. Exchange one quad at a time with new or previously removed DIMM quads
  - b. System backplane, location: Un-P1
  - c. Power supplies, locations: Un-E1 and Un-E2.
2. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
3. Turn on the power using either the HMC or the white button.

**Does the managed system reach power on at hypervisor standby as indicated on the HMC?**

**NO** Reinstall the original FRU.

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**YES** Go to Verify a repair.

• **PFW1548-8**

1. Turn off the power.
2. Reconnect the system console.

**Notes:**

- a. If an ASCII terminal has been defined as the firmware console, attach the ASCII terminal cable to the S1 connector on the rear of the system unit.
- b. If a display attached to a display adapter has been defined as the firmware console, install the display adapter and connect the display to the adapter. Plug the keyboard and mouse into the keyboard connector on the rear of the system unit.
3. Turn on the power using either the HMC or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the diagnostic CD-ROM.
4. If the ASCII terminal or graphics display (including display adapter) is connected differently from the way it was previously, the console selection screen appears. Select a firmware console.
5. Immediately after the word keyboard is displayed, press the number 1 key on the directly attached keyboard, an ASCII terminal or HMC. This activates the system management services (SMS).
6. Enter the appropriate password if you are prompted to do so.

**Is the SMS screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. If you are using an ASCII terminal, go to the problem determination procedures for the display. If you do not find a problem, do the following:
  - a. Replace the system backplane, location: Un-P1.
2. If you are using a graphics display, go to the problem determination procedures for the display. If you do not find a problem, do the following:
  - a. Replace the display adapter.
  - b. Replace the backplane in which the graphics adapter is plugged.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**YES** Go to the next step.

• **PFW1548-9**

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Use the cam levers to reconnect the disk drive enclosure assembly to the I/O backplane.
4. Reconnect the removable media/disk drive enclosure assembly by sliding the media enclosure toward the rear of the system, then pressing the blue tabs.
5. Plug in the power cords and wait for 01 in the upper-left corner of the operator panel display.
6. Turn on the power using either the HMC or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the diagnostic CD-ROM.

7. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. Optical drive
2. Removable media enclosure.
3. System backplane, Un-P1.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

**YES** Go to the next step.

• **PFW1548-10**

The system is working correctly with this configuration. One of the disk drives that you removed from the disk drive backplanes may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Install a disk drive in the media/disk drive enclosure assembly.
4. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
5. Turn on the power.
6. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO** Exchange the FRUs that have not been exchanged, in the following order:

1. Last disk drive installed
2. Disk drive backplane.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

**YES** Repeat this step with all disk drives that were installed in the disk drive backplane.

After all of the disk drives have been reinstalled, go to the next step.

• **PFW1548-11**

The system is working correctly with this configuration. One of the devices that was disconnected from the system backplane may be defective.

1. Turn off the power and remove the power cords.
2. Attach a system backplane device (for example: system port 1, system port 2, USB, keyboard, mouse, Ethernet) that had been removed.

After all of the I/O backplane device cables have been reattached, reattached the cables to the service processor one at a time.

3. Plug in the power cords and wait for 01 in the upper-left corner on the operator panel display.
4. Turn on the power using either the HMC or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the diagnostic CD-ROM.
5. If the Console Selection screen is displayed, choose the system console.
6. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO** The last device or cable that you attached is defective.

To test each FRU, exchange the FRUs in the following order:

1. Device and cable (last one attached)
2. System backplane, location: Un-P1.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

**YES** Repeat this step until all of the devices are attached. Go to the next step.

• **PFW1548-12**

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed may be defective.

1. Turn off the power and remove the power cords.
2. Install a FRU (adapter) and connect any cables and devices that were attached to the FRU.
3. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
4. Turn on the power using either the HMC or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the diagnostic CD-ROM.
5. If the Console Selection screen is displayed, choose the system console.
6. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO** Go to the next step.

**YES** Repeat this step until all of the FRUs (adapters) are installed. Go to Verify a repair.

• **PFW1548-13**

The last FRU installed or one of its attached devices is probably defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Starting with the last installed adapter, disconnect one attached device and cable.

4. Plug in the power cords and wait for the 01 in the upper-left corner on the operator panel display.
5. Turn on the power using either the HMC or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the Advanced activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the diagnostic CD-ROM.
6. If the Console Selection screen is displayed, choose the system console.
7. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO** Repeat this step until the defective device or cable is identified or all devices and cables have been disconnected.

If all the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.

To test each FRU, exchange the FRUs in the following order:

1. Adapter (last one installed)
2. System backplane, location: Un-P1.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**YES** The last device or cable that you disconnected is defective. Exchange the defective device or cable then go to the next step.

• **PFW1548-14**

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. Select **Advanced Diagnostics Routines**.
4. If the terminal type has not been defined, you must use the option **Initialize Terminal** on the FUNCTION SELECTION menu to initialize the AIX diagnostic environment before you can continue with the diagnostics. This is a separate operation from selecting the console display.
5. If the NEW RESOURCE screen is displayed, select an option from the bottom of the screen.

**Note:** Adapters and devices that require supplemental media are not shown in the new resource list. If the system has adapters or devices that require supplemental media, select option 1.

6. When the DIAGNOSTIC MODE SELECTION screen is displayed, press Enter.
7. Select **All Resources**. (If you were sent here from step PFW1548-18, select the adapter or device that was loaded from the supplemental media).

**Did you get an SRN?**

**NO** Go to step PFW1548-16.

**YES** Go to the next step.

• **PFW1548-15**

Look at the FRU part numbers associated with the SRN.

**Have you exchanged all the FRUs that correspond to the failing function codes (FFCs)?**

**NO** Exchange the FRU with the highest failure percentage that has not been changed.

Repeat this step until all the FRUs associated with the SRN have been exchanged or diagnostics run with no trouble found. Run diagnostics after each FRU is exchanged. Go to Verify a repair.

**YES** If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

- **PFW1548-16**

**Does the system have adapters or devices that require supplemental media?**

**NO** Go to step the next step.

**YES** Go to step PFW1548-18.

- **PFW1548-17**

Consult the PCI adapter configuration documentation for your operating system to verify that all adapters are configured correctly.

Go to Verify a repair.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

- **PFW1548-18**

1. Select **Task Selection**.

2. Select **Process Supplemental Media** and follow the on-screen instructions to process the media. Supplemental media must be loaded and processed one at a time.

**Did the system return to the TASKS SELECTION SCREEN after the supplemental media was processed?**

**NO** Go to the next step.

**YES** Press F3 to return to the FUNCTION SELECTION screen. Go to step PFW1548-14, substep 4 on page 384.

- **PFW1548-19**

The adapter or device is probably defective.

If the supplemental media is for an adapter, replace the FRUs in the following order:

1. Adapter
2. System backplane, location: Un-P1.

If the supplemental media is for a device, replace the FRUs in the following order:

1. Device and any associated cables
2. The adapter to which the device is attached

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

Go to Verify a repair.

**End of procedure.**

## **PFW1548: Memory and processor subsystem problem isolation procedure without an HMC attached**

This procedure is used to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU 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.

**Note:** the system backplane has two memory DIMM quads: Un-P1-C14 to Un-P1-C17, and Un-P1-C21 to Un-P1-C24. See System FRU locations.

Perform the following procedure:

- **PFW1548-1**

1. Ensure that the diagnostics and the operating system are shut down.

**Is the system at "service processor standby", indicated by 01 in the control panel?**

**NO** Replace the system backplane, location: Un-P1. Return to step PFW1548-1.

**YES** Continue with substep 2.

2. Turn on the power using either the white button or the ASMI menus.

**Does the system reach an operating system login prompt, or if booting the AIX diagnostic CD-ROM, is the "Please define the System Console" screen displayed?**

**NO** Go to PFW1548-3.

**YES** Go to PFW1548-2.

3. Insert the AIX diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the diagnostic CD-ROM, go to PFW1548-2.

4. When the word keyboard is displayed on an ASCII terminal or a directly attached keyboard, press the number 5 key.

5. If you are prompted to do so, enter the appropriate password.

**Is the "Please define the System Console" screen displayed?**

**NO** Go to PFW1548-2.

**YES** Go to PFW1548-14.

- **PFW1548-2**

1. Insert the AIX diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the diagnostic CD-ROM, go to step PFW1548-3.

2. Turn on the power using either the white button or the ASMI menus. If the diagnostic CD-ROM is not in the optical drive, insert it now. If you are prompted to do so, enter the appropriate password.

**Is the "Please define the System Console" screen displayed?**

**NO** Go to PFW1548-3.

**YES** Go to PFW1548-14.

- **PFW1548-3**

1. Turn off the power.
2. If you have not already done so, configure the service processor (using the ASMI menus) with the instructions in note 6 on page 365 at the beginning of this procedure, then return here and continue.
3. Exit the service processor (ASMI) menus and remove the power cords.
4. Disconnect all external cables (parallel, system port 1, system port 2, keyboard, mouse, USB devices, SPCN, Ethernet on the system planar, and so on). Also disconnect all of the external cables attached to the service processor.

Go to the next step.

- **PFW1548-4**

1. If this is a desktide system, remove the service access cover. If this is a rack-mounted system, place the drawer into the service position and remove the service access cover. Also remove the front cover.
2. Record the slot numbers of the PCI adapters and I/O expansion cards if present. Label and record the locations of all cables attached to the adapters. Disconnect all cables attached to the adapters and remove all of the adapters.
3. Remove the removable media/disk drive enclosure assembly by pulling out the blue tabs at the bottom of the enclosure, then sliding the enclosure out approximately three centimeters.
4. Remove and label the disk drives from the media/disk drive enclosure assembly.
5. Remove a memory DIMM quad.

**Notes:**

- a. Place the memory DIMM locking tabs in the locked (upright) position to prevent damage to the tabs.
  - b. Memory DIMMs must be installed in quads and in the correct connectors. Refer to System FRU locations for information on memory DIMM locations.
6. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
  7. Turn on the power using the white button.

**Does the system reach an operating system login prompt, or if booting the AIX diagnostic CD-ROM, is the "Please define the System Console" screen displayed?**

**NO** Go to PFW1548-7.

**YES** Go to the next step.

• **PFW1548-5**

**Were any memory DIMMs removed from system backplane?**

**NO** Go to PFW1548-8.

**YES** Go to the next step.

• **PFW1548-6**

1. Turn off the power, and remove the power cords.
2. Replug the memory DIMMs that were removed from the system backplane in PFW1548-2 in their original locations.

**Notes:**

- a. Place the memory DIMM locking tabs into the locked (upright) position to prevent damage to the tabs.
  - b. Memory DIMMs must be installed in quads in the correct connectors. Refer to System FRU locations for information on memory DIMM locations.
3. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
  4. Turn on the power using the white button.

**Does the system reach an operating system login prompt, or if booting the AIX diagnostic CD-ROM, is the "Please define the System Console" screen displayed?**

**NO** A memory DIMM in the quad you just replaced in the system is defective. Turn off the power, remove the power cords, and exchange the memory DIMMs quad with new or previously removed memory DIMM quad. Repeat this step until the defective memory DIMM quad is identified, or both memory DIMM quads have been exchanged.

**Note:** the system backplane has two memory DIMM quads: *Un-P1-C14* to *Un-P1-C17* and *Un-P1-C21* to *Un-P1-C24*. See System FRU locations.

If your symptom did not change and both the memory DIMM quads have been exchanged, call your service support person for assistance.

If the symptom changed, check for loose cards and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**YES** Go to the next step.

• **PFW1548-7**

One of the FRUs remaining in the system unit is defective.

**Note:** If a memory DIMM is exchanged, ensure that the new memory DIMM is the same size and speed as the original memory DIMM.

1. Turn off the power, remove the power cords, and exchange the following FRUs, one at a time, in the order listed:
  - a. Memory DIMMs. Exchange one quad at a time with new or previously removed DIMM quads
  - b. System backplane, location: Un-P1
  - c. Power supplies, locations: Un-E1 and Un-E2.
2. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
3. Turn on the power using the white button.

**Does the system reach an operating system login prompt, or if booting the AIX diagnostic CD-ROM, is the "Please define the System Console" screen displayed?**

**NO** Reinstall the original FRU.

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**YES** Go to Verify a repair.

• **PFW1548-8**

1. Turn off the power.
2. Reconnect the system console.

**Notes:**

- a. If an ASCII terminal has been defined as the firmware console, attach the ASCII terminal cable to the S1 connector on the rear of the system unit.
- b. If a display attached to a display adapter has been defined as the firmware console, install the display adapter and connect the display to the adapter. Plug the keyboard and mouse into the keyboard connector on the rear of the system unit.
3. Turn on the power using the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.)
4. If the ASCII terminal or graphics display (including display adapter) is connected differently from the way it was previously, the console selection screen appears. Select a firmware console.
5. Immediately after the word keyboard is displayed, press the number 1 key on the directly attached keyboard, or an ASCII terminal. This action activates the system management services (SMS).
6. Enter the appropriate password if you are prompted to do so.

**Is the SMS screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. If you are using an ASCII terminal, go to the problem determination procedures for the display. If you do not find a problem, do the following:
  - a. Replace the system backplane, location: Un-P1.
2. If you are using a graphics display, go to the problem determination procedures for the display. If you do not find a problem, do the following:
  - a. Replace the display adapter.
  - b. Replace the backplane in which the graphics adapter is plugged.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**YES** Go to the next step.

• **PFW1548-9**

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Use the cam levers to reconnect the disk drive enclosure assembly to the I/O backplane.
4. Reconnect the removable media/disk drive enclosure assembly by sliding the media enclosure toward the rear of the system, then pressing the blue tabs.
5. Plug in the power cords and wait for 01 in the upper-left corner of the operator panel display.
6. Turn on the power using the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.)
7. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. Optical drive
2. Removable media enclosure.
3. System backplane, Un-P1.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

**YES** Go to the next step.

• **PFW1548-10**

The system is working correctly with this configuration. One of the disk drives that you removed from the disk drive backplanes may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.

2. Turn off the power and remove the power cords.
3. Install a disk drive in the media/disk drive enclosure assembly.
4. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
5. Turn on the power.
6. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO** Exchange the FRUs that have not been exchanged, in the following order:

1. Last disk drive installed
2. Disk drive backplane.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

**YES** Repeat this step with all disk drives that were installed in the disk drive backplane.

After all of the disk drives have been reinstalled, go to the next step.

• **PFW1548-11**

The system is working correctly with this configuration. One of the devices that was disconnected from the system backplane may be defective.

1. Turn off the power and remove the power cords.
2. Attach a system backplane device (for example: system port 1, system port 2, USB, keyboard, mouse, Ethernet) that had been removed.  
After all of the I/O backplane device cables have been reattached, reattached the cables to the service processor one at a time.
3. Plug in the power cords and wait for 01 in the upper-left corner on the operator panel display.
4. Turn on the power using the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.)
5. If the Console Selection screen is displayed, choose the system console.
6. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO** The last device or cable that you attached is defective.

To test each FRU, exchange the FRUs in the following order:

1. Device and cable (last one attached)
2. System backplane, location: Un-P1.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

**YES** Repeat this step until all of the devices are attached. Go to the next step.

- **PFW1548-12**

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed may be defective.

1. Turn off the power and remove the power cords.
2. Install a FRU (adapter) and connect any cables and devices that were attached to the FRU.
3. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
4. Turn on the power using the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.)
5. If the Console Selection screen is displayed, choose the system console.
6. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO** Go to the next step.

**YES** Repeat this step until all of the FRUs (adapters) are installed. Go to Verify a repair.

- **PFW1548-13**

The last FRU installed or one of its attached devices is probably defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Plug in the power cords and wait for the 01 in the upper-left corner on the operator panel display.
5. Turn on the power using either the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.)
6. If the Console Selection screen is displayed, choose the system console.
7. Immediately after the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the "Please define the System Console" screen displayed?**

**NO** Repeat this step until the defective device or cable is identified or all devices and cables have been disconnected.

If all the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.

To test each FRU, exchange the FRUs in the following order:

1. Adapter (last one installed)
2. System backplane, location: Un-P1.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**YES** The last device or cable that you disconnected is defective. Exchange the defective device or cable and then go to the next step.

- **PFW1548-14**

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.

3. Select **Advanced Diagnostics Routines**.
4. If the terminal type has not been defined, you must use the option **Initialize Terminal** on the FUNCTION SELECTION menu to initialize the AIX diagnostic environment before you can continue with the diagnostics. This is a separate operation from selecting the console display.
5. If the NEW RESOURCE screen is displayed, select an option from the bottom of the screen.

**Note:** Adapters and devices that require supplemental media are not shown in the new resource list. If the system has adapters or devices that require supplemental media, select option 1.

6. When the DIAGNOSTIC MODE SELECTION screen is displayed, press Enter.
7. Select **All Resources**. If you were sent here from step PFW1548-18, select the adapter or device that was loaded from the supplemental media.

#### **Did you get an SRN?**

**NO** Go to step PFW1548-16.

**YES** Go to the next step.

- **PFW1548-15**

Look at the FRU part numbers associated with the SRN.

#### **Have you exchanged all the FRUs that correspond to the failing function codes (FFCs)?**

**NO** Exchange the FRU with the highest failure percentage that has not been changed.

Repeat this step until all the FRUs associated with the SRN have been exchanged or diagnostics run with no trouble found. Run diagnostics after each FRU is exchanged. Go to Verify a repair.

**YES** If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

- **PFW1548-16**

#### **Does the system have adapters or devices that require supplemental media?**

**NO** Go to step the next step.

**YES** Go to step PFW1548-18.

- **PFW1548-17**

Consult the PCI adapter configuration documentation for your operating system to verify that all adapters are configured correctly.

Go to Verify a repair.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

- **PFW1548-18**

1. Select **Task Selection**.

2. Select **Process Supplemental Media** and follow the on-screen instructions to process the media. Supplemental media must be loaded and processed one at a time.

#### **Did the system return to the TASKS SELECTION SCREEN after the supplemental media was processed?**

**NO** Go to the next step.

**YES** Press F3 to return to the FUNCTION SELECTION screen. Go to step PFW1548-14, substep 4.

- **PFW1548-19**

The adapter or device is probably defective.

If the supplemental media is for an adapter, replace the FRUs in the following order:

1. Adapter
2. System backplane, location: Un-P1.

If the supplemental media is for a device, replace the FRUs in the following order:

1. Device and any associated cables
2. The adapter to which the device is attached

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

Go to Verify a repair.

**End of procedure.**



---

## Appendix. Notices

This information was developed for products and services offered in the U.S.A.

The manufacturer may not offer the products, services, or features discussed in this document in other countries. Consult the manufacturer's representative for information on the products and services currently available in your area. Any reference to the manufacturer's product, program, or service is not intended to state or imply that only that product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any intellectual property right of the manufacturer may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any product, program, or service.

The manufacturer may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to the manufacturer.

**The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:** THIS INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. The manufacturer may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to Web sites not owned by the manufacturer are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this product and use of those Web sites is at your own risk.

The manufacturer may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning products not produced by this manufacturer was obtained from the suppliers of those products, their published announcements or other publicly available sources. This manufacturer has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to products not produced by this manufacturer. Questions on the capabilities of products not produced by this manufacturer should be addressed to the suppliers of those products.

All statements regarding the manufacturer's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

The manufacturer's prices shown are the manufacturer's suggested retail prices, are current and are subject to change without notice. Dealer prices may vary.

This information is for planning purposes only. The information herein is subject to change before the products described become available.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

If you are viewing this information in softcopy, the photographs and color illustrations may not appear.

The drawings and specifications contained herein shall not be reproduced in whole or in part without the written permission of the manufacturer.

The manufacturer has prepared this information for use with the specific machines indicated. The manufacturer makes no representations that it is suitable for any other purpose.

The manufacturer's computer systems contain mechanisms designed to reduce the possibility of undetected data corruption or loss. This risk, however, cannot be eliminated. Users who experience unplanned outages, system failures, power fluctuations or outages, or component failures must verify the accuracy of operations performed and data saved or transmitted by the system at or near the time of the outage or failure. In addition, users must establish procedures to ensure that there is independent data verification before relying on such data in sensitive or critical operations. Users should periodically check the manufacturer's support websites for updated information and fixes applicable to the system and related software.

---

## Trademarks

IBM, the IBM logo, and [ibm.com](http://ibm.com) are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at Copyright and trademark information at [www.ibm.com/legal/copytrade.shtml](http://www.ibm.com/legal/copytrade.shtml).

Other company, product, or service names may be trademarks or service marks of others.

---

## Electronic emission notices

### Class A Notices

The following Class A statements apply to the IBM servers that contain the POWER6 processor.

### Federal Communications Commission (FCC) statement

**Note:** 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.

### **Industry Canada Compliance Statement**

This Class A digital apparatus complies with Canadian ICES-003.

### **Avis de conformité à la réglementation d'Industrie Canada**

Cet appareil numérique de la classe A respecte est conforme à la norme NMB-003 du Canada.

### **European Community Compliance Statement**

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to 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.

European Community contact:  
IBM Technical Regulations  
Pascalstr. 100, Stuttgart, Germany 70569  
Tele: 0049 (0)711 785 1176  
Fax: 0049 (0)711 785 1283  
E-mail: tjahn@de.ibm.com

**Warning:** 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.

### **VCCI Statement - Japan**

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

The following is a summary of the VCCI Japanese statement in the box above.

This product is a Class A Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

## Electromagnetic Interference (EMI) Statement - People's Republic of China

### 声 明

此为 A 级产品,在生活环境中,  
该产品可能会造成无线电干扰。  
在这种情况下,可能需要用户对其  
干扰采取切实可行的措施。

Declaration: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical action.

## 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.

### IBM Taiwan Contact Information:

台灣IBM 產品服務聯絡方式：  
台灣國際商業機器股份有限公司  
台北市松仁路7號3樓  
電話：0800-016-888

## Electromagnetic Interference (EMI) Statement - Korea

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자  
또는 사용자는 이점을 주의하시기 바라며, 만약 잘못 판매 또는  
구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Please note that this equipment has obtained EMC registration for commercial use. In the event that it has been mistakenly sold or purchased, please exchange it for equipment certified for home use.

## Germany Compliance Statement

### Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der IBM gesteckt/eingebaut werden.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:  
"Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

### Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

### Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A.

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach des EMVG ist die IBM Deutschland GmbH, 70548 Stuttgart.

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse A.

## Electromagnetic Interference (EMI) Statement - Russia

**ВНИМАНИЕ!** Настоящее изделие относится к классу А.  
В жилых помещениях оно может создавать радиопомехи, для снижения которых необходимы дополнительные меры

---

## Terms and conditions

Permissions for the use of these publications is granted subject to the following terms and conditions.

**Personal Use:** You may reproduce these publications for your personal, noncommercial use provided that all proprietary notices are preserved. You may not distribute, display or make derivative works of these publications, or any portion thereof, without the express consent of the manufacturer.

**Commercial Use:** You may reproduce, distribute and display these publications solely within your enterprise provided that all proprietary notices are preserved. You may not make derivative works of these publications, or reproduce, distribute or display these publications or any portion thereof outside your enterprise, without the express consent of the manufacturer.

Except as expressly granted in this permission, no other permissions, licenses or rights are granted, either express or implied, to the publications or any data, software or other intellectual property contained therein.

The manufacturer reserves the right to withdraw the permissions granted herein whenever, in its discretion, the use of the publications is detrimental to its interest or, as determined by the manufacturer, the above instructions are not being properly followed.

You may not download, export or re-export this information except in full compliance with all applicable laws and regulations, including all United States export laws and regulations.

THE MANUFACTURER MAKES NO GUARANTEE ABOUT THE CONTENT OF THESE PUBLICATIONS. THESE PUBLICATIONS ARE PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE.



BULL CEDOC  
357 AVENUE PATTON  
B.P.20845  
49008 ANGERS CEDEX 01  
FRANCE

REFERENCE  
86 A1 97FA 01