

AS/400e



Migrated Expansion Tower Problem Analysis, Repair and Parts

Version 4

AS/400e



Migrated Expansion Tower Problem Analysis, Repair and Parts

Version 4

Note

Before using this information and the product it supports, be sure to read the information in "Safety and Environmental Notices" on page iii and "Notices" on page 917.

First Edition (June 2000)

This edition applies to version 4, release 5, modification 0 of OS/400 Operating System and to all subsequent releases and modifications until otherwise indicated in new editions. This edition applies only to reduced instruction set computer (RISC) systems.

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Safety and Environmental Notices

Danger Notices

A danger notice calls attention to a situation that is potentially lethal or extremely hazardous to people.

Use the following danger notices throughout this book:

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

To prevent a possible electrical shock, do not use the port tester during electrical storms. (RSFTD006)

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the products that attach to the system. It is the customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (RSFTD201)

DANGER

To prevent a possible electrical shock when installing the system, ensure that the power cords for all devices are unplugged before installing signal cables. (RSFTD202)

DANGER

To prevent a possible electrical shock when adding or removing any devices to or from the system, ensure that the power cords for those devices are unplugged before the signal cables are connected or disconnected. If possible, disconnect all power cords from the existing system before you add or remove a device. (RSFTD203)

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

DANGER

Use caution when installing or modifying telephone lines. Disconnect the lines at the network interface before working with telephone wires that are not insulated. Never install telephone jacks that are not waterproof in wet locations. Do not install or modify telephone lines or use a telephone (other than a cordless type) during an electrical storm. Do not use a telephone to report a gas leak in the area of the leak. (RSFTD213)

Caution Notices

A caution notice calls attention to a situation that is potentially hazardous to people because of some existing condition.

CAUTION:

Be careful when removing or installing this part or unit. This part or unit is heavy, but has a weight smaller than 18 kilograms (39.7 pounds). (RSFTC201)

CAUTION:

The weight of this part or unit is between 18 and 32 kilograms (39.7 and 70.5 pounds). It takes two persons to safely lift this part or unit. (RSFTC204)

CAUTION:

The battery is a lead-acid battery. To avoid possible explosion, do not burn. Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations.

In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (RSFTC225)

CAUTION:

The battery is a lithium battery. To avoid possible explosion, do not burn or charge the battery. Exchange only with the IBM-approved part. Discard the battery as instructed by local regulations. (RSFTC227)

CAUTION:

The circuit card contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the circuit card as instructed by local regulations. (RSFTC234)

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

CAUTION:

The optical link card contains a laser. To avoid the release of toxic substances into the environment, do not burn. Discard the optical link as instructed by local regulations. (RSFTC236)

Attention Notices

An attention notice indicates the possibility of damage to a program, device, system, or data.

Laser Safety Information

CAUTION:

This product may contain a CD-ROM which is a class 1 laser product. (RSFTC240)

Product Recycling and Disposal

Components of the system, such as structural parts and circuit cards, can be recycled where recycling facilities exist. IBM does not currently collect and recycle used IBM products from customers in the United States other than those products that are involved in trade-in programs. Companies are available to disassemble, reutilize, recycle, or dispose of electronic products. Contact an IBM account representative for more information.

The system unit contains batteries and circuit boards with lead solder. Before you dispose of this unit, these batteries and circuit boards must be removed and discarded according to local regulations or recycled where facilities exist. This book contains specific information on each battery type where applicable.

Battery Return Program

In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used IBM batteries and battery packs. For information on proper disposal of the batteries in this unit, please contact IBM at 1-800-426-4333. Please have the IBM part number that is listed on the battery available when you make your call. For information on battery disposal outside the United States, contact your local waste disposal facility.

Environmental Design

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

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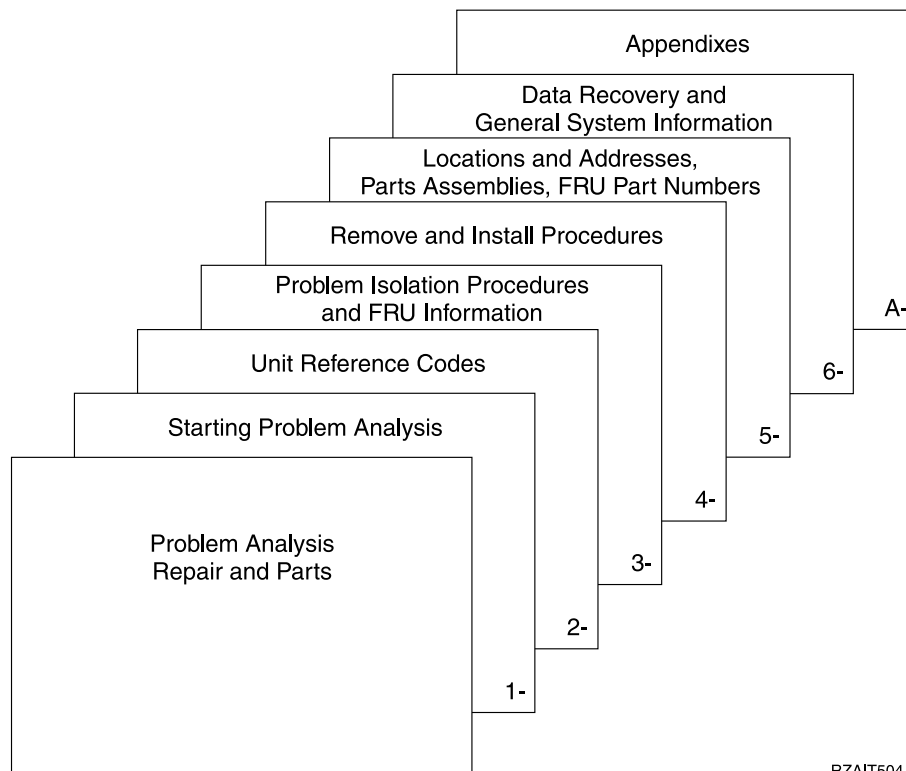
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Starting Point For All Problems

This book is to be used in conjunction with either the *AS/400e server 270, and 820 Problem Analysis, Repair and Parts* or the *AS/400e server 830, 840, SB2, and SB3 Problem Analysis, Repair and Parts*. Those books should have sent you to a section in this book. All problem analysis starts in one of those two books.

Do not start the problem analysis process from this book! If you were sent to the Starting Point For All Problems from a directed procedure in this book, check Chapter 1 in the Problem Analysis, Repair and Parts book above.



RZAIT504-1

Analyzing Intermittent Problems

The information in this section helps you correct intermittent problems on the AS/400 system.

Intermittent Problems

Safety

The following danger notice always applies in this intermittent section:

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

Special Tools and Equipment

You must make all ac voltage measurements with a meter that measures true root mean square (RMS) voltage. The Fluke** multimeter present in most IBM tool kits measures true RMS voltage. You can also use Fluke 8060A, 8600A, or equal meters.

You can get equipment for the following conditions from your branch office or installation planning representative:

- If you suspect that the air at the system site is too hot or too cold, you need a thermometer to check the temperature.
- If you suspect the moisture content of the air at the system site is too low or too high, use a wet/dry bulb to check the humidity. See “General Intermittent Problem Checklist” on page 6 for more information.
- If you need to check ac receptacles for correct wiring, you need an ECOS** tester, Model 1023-100, or equivalent tester. The tester lets you quickly check the receptacles. If you cannot find a tester, use an analog multimeter instead. Do not use a digital multimeter.
- To send data with a Licensed Internal Code Trouble Report (LICTR), you need a blank tape for a storage dump. Since you cannot predict when you might need a blank tape, you should always keep a blank tape available.

How to Use This Intermittent Problem Section

You are here because of intermittent problems.

Follow the steps in this procedure to correct an intermittent problem.

1. Read all of the information in “Correcting Intermittent Problems” before you attempt to correct an intermittent problem. Then continue with the next step of this procedure.
2. Perform ALL steps in the “General Intermittent Problem Checklist” on page 6. Then return to this step of this procedure and answer the following question.
Did you correct the intermittent problem?
No Yes
↓ **This ends the procedure.**
3. Go to “How to Analyze the Intermittent Problem” on page 9.
This ends the procedure.

Correcting Intermittent Problems

What Is an Intermittent Problem?

An intermittent problem is a problem that occurs for a short time, and then goes away. The problem may not occur again until some time in the future, if at all. Intermittent problems cannot be made to appear again easily.

Some examples of intermittent problems are:

- An system reference code (SRC) occurs on the control panel (the System Attention light is on) but disappears when you power off, then power on the system. An entry does not appear in the Product Activity Log.
- An entry appears in the problem log when you use the Work with Problems (WRKPRB) command. For example, the FC 5032 I/O Card Unit becomes powered off, but starts working again when you power it on.
- The workstation I/O processor is in a hang condition but starts working normally when you enter Vary Configuration command (VRYCFG *CTL RESET(*YES)).

Hints for Correcting Intermittent Problems

An intermittent problem can show many different symptoms, so it may be difficult for you to determine the real cause without completely analyzing the failure. To help with this analysis, you should determine as many symptoms as possible.

- The complete SRC and unit reference code (URC) information is necessary to determine the exact failing area and the probable cause.
- Product Activity Log information can provide time and device relationships.
- Information on environmental conditions when the failure occurred can be helpful (for example, an electrical storm occurring when the failure occurred).

Types of Intermittent Problems

There are four major types of intermittent problems:

- Code (PTFs)
 - Licensed Internal Code
 - OS/400 (operating system)
 - Licensed program products
 - Other application software
- Configuration
 - Non-supported hardware that is used on the system
 - Non-supported system configurations
 - Non-supported communication networks
 - Model and feature upgrades that are not performed correctly
 - Moving of down-level hardware from other systems to the AS/400 system
 - Incorrectly configured or incorrectly cabled devices
- Environment
 - Power line disturbance—for example, reduced voltage (sag), a pulse, a surge, or total loss of voltage on the incoming ac voltage line
 - Power line transient—for example, a lightning strike
 - Electrical noise (constant or intermittent)
 - Defective grounding or a ground potential difference
 - Mechanical vibration
- Intermittent hardware failure

Note: If you suspect that an intermittent problem is occurring, increase the log sizes to the largest sizes possible. Select the *Product activity log* option on the Start a Service Tool display (see “Product Activity Log” in the *AS/400 Service Functions* information).

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General Intermittent Problem Checklist

The following steps have been successful in correcting intermittent problems on the AS/400 system. Performing these steps removes the known causes of most intermittent problems. Therefore, *it is important that you perform all of these steps*. Some customers have a high availability requirement for the AS/400 system (such as 24 hours a day, 7 days a week). It is very important that you perform all the steps in this checklist to ensure that the system can meet this availability requirement.

1. Discuss the problem with the customer. Look for the following symptoms:
 - An SRC or reference code that goes away when you power off the system, then power on the system.
 - Repeated failure patterns that you cannot explain. For example, the problem occurs at the same time of day or on the same day of the week. Look for some type of pattern.
 - Failures that started after system installation
 - Failures that occurred during customer usage.
 - Failures that started after recent service or customer actions, system upgrade, addition of I/O devices, new software, or program temporary fix (PTF) installation.
 - Failures occurring only during high system usage.
 - Failures occur when people are close to the system or machines are attached to the system.
2. Recommend that the customer install the latest cumulative PTF package, since code PTFs have corrected many problems that seem to be hardware failures. The customer can order the latest cumulative PTF package electronically through Electronic Customer Support or by calling the IBM Software Support Center.

Review the Service Recommendations in the Preventive Service Planning (PSP) listing for any additional HIPER (high impact pervasive) PTFs. This information is available from the IBM Software Support Center and are ordered electronically through Electronic Customer Support using the Send PTF Order command (SNDPTFORD). The *AS/400 Basic System Operation, Administration, and Problem Handling* information contains a chapter on "Working with PTFs".
3. Review the latest hardware service information for symptoms that are related to the problem.

Ask your next level of support for the latest information available.
4. If you have not already done so, use the maintenance package to see the indicated actions for the symptom described by the customer. Attempt to perform the online problem analysis procedure first. If this is not possible, such as when the system is down, go to "Starting Point For All Problems" on page 3.

Use additional diagnostic tools, if necessary, and attempt to cause the problem to occur again.

Note: Ensure that the service information you are using is at the same level as the operating system. For example, do not use Version 3 Release 1 manuals when servicing a system with software at Version 3 Release 6 level.
5. Check the site for causes of electrical noise that match the start of the intermittent problems. Ask the customer such questions as:

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- Have any external changes or additions, such as building wiring, air conditioning, or elevators been made to the site?
- Has any arc welding occurred in the area?
- Has any heavy industrial equipment, such as cranes, been operating in the area?
- Have there been any thunderstorms in the area?
- Have the building lights become dim?
- Has any equipment been relocated, especially computer equipment?

Find the source of the electrical noise and prevent the noise from getting into the system.

6. Ensure that site temperature and humidity are compatible with system specifications. See web site <http://www.as400.ibm.com/tstudio/planning/plngstr.htm> for site physical planning information.

Acceptable operating conditions are:

- Temperature: 10° C to 37.8° C (50° F to 100° F)
- Humidity: 8% to 80% relative humidity

The best operating conditions are:

- Temperature: 23° C (73° F)
- Humidity: 40% to 60% relative humidity

7. Check the air quality in the computer room:
 - Look for dust on top of objects. Dust particles in the air cause poor electrical connections and may cause DASD failures.
 - Smell for unusual odors in the air. Some gases can corrode electrical connections.
8. Ask the customer if any large vibration (caused by thunder, an earthquake, an explosion, or road construction) occurred in the area at the time of the failure.

Note: A failure that is caused by vibration is more probable if the AS/400 system is on a raised floor.

9. Ensure that all ground connections are tight. These items reduce the effects of electrical noise.

Check the ground connections by doing the following:

- a. Look in the system installation information for instructions on how to connect the ground straps to the frame bar and the correct hardware to use. The hardware is part of the ship group kit.
- b. Ensure that a star washer is between the head of the screw and the ground strap.
- c. Hold the ground strap and attempt to turn it counter-clockwise around the screw.

Does the screw loosen?

No **Yes**

↓ Tighten the screw more, then repeat this step.

- d. Measure the resistance between a conductive place on the frame to building ground or to earth ground. The resistance **must** be 1.0 ohm or less.
10. All cables that leave each frame **must** be fastened to the bottom bar of each frame with a cable tie or clamp.

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- Ensure that you pull the cable ties tight enough to fasten the cable to the frame bar tightly.

A loose cable can be accidentally pulled with enough force to unseat the logic card in the frame to which the cable is attached. If the system is powered on, the logic card could be destroyed.

11. Where required, ensure that ferrite cores and their covers are installed on both ends of all IPI-3 signal cables (DFCI cables) that leave the frame. The ferrite core can be installed up to 15 cm (6 inches) from the connector; the recommended distance is 8.5 cm (3.4 inches).

The ferrite core is part 62X1146. The cover for the ferrite core is part 6495272.

Note: If the IPI-3 signal cables do not leave the frame, ensure that they do not hang below the bottom of the frame. If they do, tie them up inside the frame.

12. Ensure that all workstation and communications cables meet IBM specifications:
 - All connections are tight.
 - Any twinaxial cables that are not attached to devices must be removed.
 - The lengths and numbers of connections in the cables must be correct.
 - Ensure that lightning protection is installed on any twinaxial cables that enter or leave the building.
13. Review the service entries to determine what service actions were performed on the system (see the "Appendix A. Problem Summary Form" on page 895).
14. Review the entries in the problem log (WRKPRB) and look for problems that were reported to the user.
15. Review the entries in the Product Activity Log and look for a pattern:
 - SRCs on multiple input-output processors (IOP) occurring at the same time
 - SRCs that have a common "time of day" or "day of week" pattern
 - Log is wrapping (hundreds of recent entries and no older entries)

Check the Product Activity Log sizes and increase them if they are smaller than recommended.

16. Review the entries in the history log (Display Log (DSPLOG)) and look for a change that matches the start of the intermittent problems.
17. Check your records and the service log to ensure that the latest engineering changes are installed on the system and on all system I/O devices.
18. Ensure that the hardware configuration is correct and that the model configuration rules have been followed
 - Use the display hardware configuration service function (under SST or DST) to check for any missing or failed hardware.
19. Was a manufacturing engineering service (MES), system upgrade, feature, or any other field bill of material or feature field bill of material installed just before the intermittent problems started occurring?

No **Yes**

- ↓ Review the installation instructions to ensure that each step was performed correctly. Then continue with the next step of this procedure.

20. Is the problem associated with a storage device?

No **Yes**

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- ↓ Ensure that the customer is using the correct storage device cleaning procedures and good storage media. Then continue with the next step of this procedure.
- 21. Ensure that all the items in “Appendix B. Preventive Maintenance (PM)” on page 897 are being performed regularly.
Performing the following helps prevent intermittent thermal checks:
 - Ensuring that the AMDs on all disk units, tape units, and power supplies are working
 - Exchanging all air filters as recommended
- 22. If necessary, review the intermittent problems with your next level of support and installation planning representative.
Ensure that all installation planning checks were made on the system. Because external conditions are constantly changing, the site may need to be checked again.
This ends the procedure.

How to Analyze the Intermittent Problem

1. Is a reference code associated with the intermittent problem?
No Yes
 - ↓ Go to “Chapter 2. Unit Reference Codes” on page 17 and find the reference code. If the actions in the unit reference code tables do not correct the intermittent problem, return here and continue with the next step of this procedure.
2. Is a symptom associated with the intermittent problem?
No Yes
 - ↓ Go to “Intermittent Symptom Table”. If the Intermittent Symptom Table does not correct the intermittent problem, return here and continue with the next step of this procedure.
3. Go to “Failing Area INT-PIP Table” on page 10. If the Failing Area INT-PIP Table does not correct the intermittent problem, return here and continue with the next step of this procedure.
4. Send the data you have collected to your next level of support so that an Authorized Program Analysis Report (APAR) or a Licensed Internal Code Trouble Report (LICTR) can be written.
This ends the procedure.

Intermittent Symptom Table

1. In the *Symptom* column, find the failure symptom.
2. In the *Description* column, read the description of the failure.
3. In the *INT-PIPs* column, perform the INT-PIPs shown for that symptom beginning at “Intermittent Problem Isolation Procedures” on page 313.

Although an INT-PIP may correct the intermittent problem, use your best judgment to determine if you should perform the remainder of the INT-PIPs shown for the symptom.

If the symptom for the intermittent problem you have is not listed, go to “Failing Area INT-PIP Table” on page 10.

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Symptom	Description	INT-PIPs
System becomes powered off.	The system was operating correctly, then the system became powered off. SRC 0000 111x may occur when this happens, but the SRC information is lost if the customer performs an IPL after the failure and does not record the SRC. Notes: 1. If the system has no workstation I/O processor cards, omit INT-PIP5. 2. If the system has an uninterruptible power supply (UPS), perform "INT-PIP9 Utility Power and Battery Power Units" on page 317.	"INT-PIP5 External Noise on Twinaxial Cables" on page 314, "INT-PIP9 Utility Power and Battery Power Units" on page 317
System stops.	The system is powered on but is not operating correctly. No SRC or error code is displayed. The System Attention light is off. The Processor Activity lights may be on or off. Noise on the power-on reset line can cause the processor to stop. Note: Ensure that the latest service processor PTF for your release is installed.	"INT-PIP18 PTFs Not Installed" on page 320
System or subsystem runs slow.	The system or the subsystem is not processing at its normal speed (for example, QBATCH).	"INT-PIP20 Performance Problems" on page 321

If the symptom for the intermittent problem you have is not listed, go to "Failing Area INT-PIP Table".

Failing Area INT-PIP Table

Use this table only if you do not have an SRC or cannot find your symptom in the "Intermittent Symptom Table" on page 9.

Note: Before performing any INT-PIPs in Table 1, first perform all of the steps in "General Intermittent Problem Checklist" on page 6 for all failing areas.

1. Under *Failing Area*, find the area of failure.
2. Look down the column for the area of failure until you find an X. Look across to the *INT-PIP* column and perform the INT-PIP indicated.
3. If the INT-PIP does not correct the intermittent problem, continue down the column for the area of failure until you have performed all of the INT-PIPs shown for the failing area.

Although an INT-PIP may correct the intermittent problem, use your best judgment to determine if you should perform the remainder of the INT-PIPs shown for the failing area.

Table 1. Failing Area INT-PIPs

Failing Area						INT-PIP
Power	WSIOP	DASD MSIOP	Comm	Processor Bus	Tape Optical	Perform all steps in
X	X	X	X	X	X	"General Intermittent Problem Checklist" on page 6
X	X			X		"INT-PIP5 External Noise on Twinaxial Cables" on page 314

Table 1. Failing Area INT-PIPs (continued)

Failing Area						INT-PIP
Power	WSIOP	DASD MSIOP	Comm	Processor Bus	Tape Optical	Perform all steps in
	X	X	X	X	X	“INT-PIP7 Electromagnetic Interference (EMI)” on page 315
X						“INT-PIP9 Utility Power and Battery Power Units” on page 317
X						“INT-PIP14 Station Protectors” on page 320
		X				“INT-PIP16 Licensed Internal Code” on page 320
X	X	X	X	X	X	“INT-PIP18 PTFs Not Installed” on page 320
	X	X	X	X	X	“INT-PIP20 Performance Problems” on page 321

Using the Product Activity Log

1. Find an entry in the Product Activity Log for the symptom you are using to locate the problem.

- a. On the command line, enter
STRSST

(the Start System Service Tools) command.

If you cannot get to SST, select DST (see “Accessing Dedicated Service Tools” in the *AS/400 Service Functions*).

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

- b. On the System Service Tools display, select the *Start a Service Tool* option (see the *AS/400 Service Functions*).
- c. Select the *Product Activity Log* option on the Start a Service Tool display.
- d. Select the *Analyze log* option on the Product Activity Log display.
- e. 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.

- f. Use the defaults on the Select Analysis Report Options display by pressing the Enter key.
- g. 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

Intermittent Problems

Resource Name:

TAP01

2. Find an SRC from the Product Activity Log that best matches the time and type of problem the customer reported.

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

Yes **No**

↓ Contact your next level of support.

This ends the procedure.

3. Go to “Chapter 2. Unit Reference Codes” on page 17 and use the SRC information to correct the problem.

This ends the procedure.

Using the Service Action Log

1. Search for an entry in the Service Action Log that matches the time, SRC, or resource of the reported problem.

- a. On the command line, enter

STRSST

(the Start System Service Tools) command.

If you cannot get to SST, use function 21 to get to DST (see “Accessing Dedicated Service Tools” in the *AS/400 Service Functions*). **Do not IPL the system to get to DST.**

- b. Select *Start a Service Tool*.
- c. On the Start a Service Tool display, select the *Hardware Service Manager* (see the *AS/400 Service Functions*).
- d. Select the *Work with service action log* option on the Hardware Service Manager display.
- e. On the *Select Timeframe* display, change the From: Date and Time to a date and time prior to when the customer reported having the problem.
- f. Search for an entry that matches one or more conditions of the problem:
 - 1) SRC
 - 2) Resource
 - 3) Time
 - 4) FRU list (choose the *Display the failing item information* option to display the FRU list).

Notes:

- a. All new entries in the Service Action Log represent problems that require a service action. It may be necessary to handle any problem in the log even if it does not match the original problem symptom.
- b. The information displayed in the date and time fields are the date and time for the first occurrence of the specific system reference code (SRC) for the resource displayed during the time range selected.

Did you find an entry in the Service Action Log?

No **Yes**

↓ Go to step 4 of this procedure.

2. Is the OS/400 operating system available?

Yes No

↓ Go to “Handling Problems for Non-critical Resources” on page 15.

This ends the procedure.

3. Go to “Using the Problem Log”.

This ends the procedure.

4. Was the entry isolated (does the letter Y appear in the Isolated column)?

Yes No

↓ Go to “Chapter 2. Unit Reference Codes” on page 17. Using the SRC that is indicated in the log, find the correct SRC table and unit reference code. Perform all actions in the “Description/Action” column before exchanging failing items.

Note: When exchanging failing items, the part numbers and locations found in the Service Action Log entry should be used.

This ends the procedure.

5. Display the failing item information for the Service Action Log entry. Items at the top of the failing item list are more likely to fix the problem than items at the bottom of the list.

Exchange the failing items one at a time until the problem is repaired. After exchanging each one of the items, verify that the item that is exchanged repaired the problem.

Notes:

- a. For Failing Items (FIs) and symbolic FRUs, go to “Chapter 3. Problem Isolation Procedures (PIPs), Failing Items, and Symbolic FRU Isolation” on page 223.
- b. If the failing item is Licensed Internal Code, contact your next level of support for the correct PTF to apply.
- c. After exchanging an item, go to Verifying the Repair in “Chapter 5. Locations, Addresses, and Part Listings” on page 687.

Once the problem has been resolved, close the log entry by selecting *Close a NEW entry* on the Service Actions Log Report display.

This ends the procedure.

Using the Problem Log

Find and analyze a Problem Log entry that relates to the problem reported.

Note: For online problem analysis (WRKPRB), ensure that you are logged on as QSRV. During problem isolation, this will allow access to test procedures that are not available under any other log-on.

1. Enter WRKPRB (the Work with Problems command) on the command line.

Note: Use F4 to change the WRKPRB parameters to select and sort on specific problem log entries that match the problem. Also, F11 displays the dates and times the problems were logged by the system.

Was an entry that relates to the problem found?

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Note: If the WRKPRB function was not available answer NO.

Yes No

↓ Go to “Handling Problems for Non-critical Resources” on page 15.

This ends the procedure.

2. Select the problem entry by moving the cursor to the problem entry option field and entering option 8 to work with the problem.

Is Analyze Problem (option 1) available on the *Work with Problem* display?

Yes No

↓ Go to step 5 of this procedure.

3. Run Analyze Problem (option 1) from the *Work with Problem* display.

Notes:

- a. For SRCs starting with 6112 or 9337, use the SRC and go to “Chapter 2. Unit Reference Codes” on page 17.
- b. If the message on the display directs you to use SST (System Service Tools), go to “COMM-PIP1” on page 308.

Was the problem corrected by the analysis procedure?

No Yes

↓ **This ends the procedure.**

4. Go to step 6 of this procedure.
5. Analyze Problem (option 1) is not available on the *Work with Problem* display. Perform the following:
 - a. Return to the initial problem log display (F12).
 - b. Select the problem entry by moving the cursor to the problem entry option field and entering option 5 to display details.
 - c. Select F5 to display possible causes.

Note: If F5 is not available, use the customer reported symptom string for customer perceived information about this problem. Then, go to “Using the Product Activity Log” on page 11.

- d. Use the list of possible causes as the FRU list and go to step 8 of this procedure.
6. Did problem analysis send you to another entry point in the service information?

No Yes

↓ Go to the entry point indicated by problem analysis.

This ends the procedure.

7. Was the problem isolated to a list of failing items?

Yes No

↓ Go to “Handling Problems for Non-critical Resources” on page 15.

This ends the procedure.

8. Exchange the failing items one at a time until the problem is repaired. After exchanging each one of the items, verify that the item exchanged repaired the problem.

Notes:

- a. For Failing Items (FIs) and symbolic FRUs, go to “Chapter 3. Problem Isolation Procedures (PIPs), Failing Items, and Symbolic FRU Isolation” on page 223.
 - b. When exchanging FRUs, go to “Chapter 4. Removal and Installation Procedures” on page 593. If you are exchanging a disk unit, go to “Recovery Procedures” on page 837.
 - c. After exchanging an item, go to “Verifying the Repair” on page 866.
9. Has the problem been resolved?
- No Yes**
- ↓ **This ends the procedure.**
10. Contact your next level of support.
- This ends the procedure.**

Handling Problems for Non-critical Resources

1. Is there an SRC in an 8 character format available on the Problem Summary form?

Note: If the operator has not filled out the Problem Summary form, go to the problem reporting procedure in the Operator’s Guide for the operating system in use.

No Yes

↓ Go to “Chapter 2. Unit Reference Codes” on page 17.

This ends the procedure.

2. Does the problem involve a workstation resource?

No Yes

↓ Check the following:

- The workstation is operational.
- The cabling/addressing for the workstation is correct.
- Perform any actions indicated in the system operator message.

If you need further assistance, contact your next level of support.

This ends the procedure.

3. Does the problem involve a removable media resource?

No Yes

↓ Go to “Using the Product Activity Log” on page 11 to resolve the problem.

This ends the procedure.

4. Does the problem involve a communications resource?

No Yes

↓

- Are there any system operator messages that indicate a communications-related problem has occurred?

No Yes

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↓ Perform any actions indicated in the system operator message.

- If you need further assistance, contact your next level of support.

This ends the procedure.

5. Contact your next level of support.

This ends the procedure.

Chapter 2. Unit Reference Codes

(2440) Magnetic Tape Subsystem Reference Codes	18	Twinaxial Workstation I/O Adapter Failing	
Magnetic Tape Subsystem Failing Items	19	Items	113
(2621) SCSI I/O Processor Reference Codes	20	(632x) Optical Storage Unit Reference Codes	113
SCSI I/O Processor Failing Items	25	Optical Storage Unit Failing Items	115
(2624) Magnetic Storage I/O Processor Reference		(6385) Tape Unit Reference Codes	116
Codes	25	Tape Unit Failing Items	118
Magnetic Storage I/O Processor Failing Items	30	(6390) Tape Unit Reference Codes	119
(2629, 2718, 2726, 2728, 2729, 2741, 2809, 2810, 2824,		Tape Unit Failing Items	124
282C, 6532, 6533, 6534, 671A) Reference Codes	30	(6500) Magnetic Storage I/O Processor Reference	
Failing Items	37	Codes	125
(2644) Tape I/O Processor Reference Codes	38	Magnetic Storage I/O Processor Failing Items	128
Tape I/O Processor Failing Items	43	(6501) Magnetic Storage I/O Processor Reference	
(266A) Workstation Adapter Reference Codes	44	Codes	129
Workstation Adapter Failing Items	46	Magnetic Storage I/O Processor Failing Items	131
(2740, 2748) Reference Codes	47	(6502, 6512) Magnetic Storage I/O Processor	
Failing Items	51	Reference Codes	131
(2746) Twinaxial Workstation Adapter Reference		Magnetic Storage I/O Processor Failing Items	136
Codes	54	(6513, 6530) Tape I/O Processor and MSIOF	
Workstation Adapter Failing Items	55	Reference Codes	137
(283C, 283D) Device Backplane Reference Codes	55	Tape I/O Processor and MSIOF Failing Items	141
Failing Items	56	(660x, 671x, 673x) Disk Unit Reference Codes	141
(3422) Tape Unit Reference Codes	56	Disk Unit Failing Items	144
Tape Unit Failing Items	58	(6A58) Workstation Adapter Console Reference	
(3430) Tape Unit Reference Codes	59	Codes	144
Tape Unit Failing Items	61	Workstation Adapter Console Failing Items	145
(3480) Tape Unit Reference Codes	61	(6A59) Workstation Adapter Console Reference	
Tape Unit Failing Items	64	Codes	145
(3490) Tape Unit Reference Codes	64	Workstation Adapter Console Failing Items	146
Tape Unit Failing Items	69	(7208) Tape Drive Reference Codes	147
(3494) Tape Library Reference Codes	70	(7208) Model 002 Tape Drive Reference Codes	148
Tape Library Failing Items	71	Model 002 Tape Drive Failing Items	151
(3570) Tape Unit Reference Codes	72	(7208) Model 012 Tape Drive Reference Codes	151
Tape Unit Failing Items	75	Model 012 Tape Drive Failing Items	157
(3590) Tape Unit Reference Codes	75	(9331) Diskette Unit Reference Codes	157
Tape Unit Failing Items	79	(9337) Disk Unit Reference Codes	158
(3995) Optical Library Dataserver Reference Codes	79	(9347) Tape Unit Reference Codes	159
(6050) Twinaxial Workstation I/O Processor		(9348) Tape Unit Reference Codes	159
Reference Codes	80	(9427) Tape Unit Reference Codes	160
Twinaxial Workstation I/O Processor Failing		Tape Unit Failing Items	164
Items	88	(A6xx) LIC Reference Codes	165
(6055) Workstation Adapter Reference Codes	89	(B003) Asynchronous Communications Reference	
Workstation Adapter Failing Items	92	Codes	165
(6056) Workstation Adapter Reference Codes	92	Asynchronous Communications Failing Items	171
Workstation Adapter Failing Items	95	(B006) Common Licensed Internal Code Reference	
(6112) Magnetic Storage I/O Processor Reference		Codes	172
Codes	95	Common Licensed Internal Code Failing Items	175
Magnetic Storage I/O Processor Failing Items	99	(B070) Reference Codes	176
(6140) Twinaxial Workstation I/O Processor		Failing Items	184
Reference Codes	99	(B075) Workstation Adapter Console Reference	
Twinaxial Workstation I/O Processor Failing		Codes	184
Items	108	Workstation Adapter Console Failing Items	188
(6141) ASCII Workstation I/O Processor Reference		(B2xx) Logical Partition Reference Codes	189
Codes	108	(B2xx) Logical Partition Failing Items	195
ASCII Workstation I/O Processor Failing Items	112	(B6xx) LIC Reference Codes	195
(6180) Twinaxial Workstation I/O Adapter		Licensed Internal Code (LIC) Failing Items	221
Reference Codes	113		

Notes:

1. In the SRC tables, x can be any number 0 through 9 or letter A through F.
2. Machine check is a condition that is indicated when the System Attention light is on and SRC data for functions 11 through 13 is displayed on the system control panel. When the SRC indicates a machine check, the leftmost character in the Data display for function 11 is 0 through 9, A, B, or F.

(2440) Magnetic Tape Subsystem Reference Codes

A tape or a 2440 Tape Unit failure occurred.

Note: For tape device and IOP reset procedures, see "TU-PIP4" on page 505.

1. Is the operating system available and can you enter commands from the command line?

Yes **No**

↓ Go to step 3 of this procedure.

2. Is OS/400 available on the system (see "Determining the Dominant Operating System" in the *AS/400 Service Functions*)?

No **Yes**

↓ Use the online problem analysis procedures to isolate the problem. Use the WRKPRB (Work with Problem) command to determine if a recent problem was entered in the problem log, or use the VFYTAP (Verify Tape) command to run verification tests.

3. Verify that the 2440 is powered on.
4. Clean the tape path as described in the 2440 service information.
5. Load the first tape.
6. Start a type D IPL from the system unit control panel.
7. Does the IPL complete successfully?

No **Yes**

↓ The problem has been corrected.

This ends the procedure.

8. Obtain another copy of the tape. Repeat steps 5 and 6 using the new tape. If the problem continues, continue with step 9.
9. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
10. If the tape unit indicator panel shows an error condition, see the tape unit maintenance manual for more information.
11. Find the reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
2001	Tape path dirty or write data error Clean the tape path using the cleaning procedures in the <i>2440 Magnetic Tape Subsystem Operator's Manual</i> , G571-0149. If this does not correct the problem, exchange the failing items.	MH50001 DH50002
2003	Tape path dirty or write identification record error Clean the tape path using the cleaning procedures in the <i>2440 Magnetic Tape Subsystem Operator's Manual</i> , G571-0149. If this does not correct the problem, exchange the failing items.	MH50001 DH50002
2008	Tape path dirty or more than one channel drop error Clean the tape path using the cleaning procedures in the <i>2440 Magnetic Tape Subsystem Operator's Manual</i> , G571-0149. If this does not correct the problem, exchange the failing items.	MH50001 DH50002
2009	Tape path dirty or read identification record error Clean the tape path using the cleaning procedures in the <i>2440 Magnetic Tape Subsystem Operator's Manual</i> , G571-0149. If this does not correct the problem, exchange the failing items.	MH50001 DH50002
2015	Tape unit failure Clean the tape path using the cleaning procedures in the <i>2440 Magnetic Tape Subsystem Operator's Manual</i> , G571-0149. If this does not correct the problem, exchange the failing items.	MH50001 DH50002
2016	Tape unit ready status lost during read or write operation Clean the tape path using the cleaning procedures in the <i>2440 Magnetic Tape Subsystem Operator's Manual</i> , G571-0149. If this does not correct the problem, exchange the failing items.	MH50001 DH50002
FFD5	Tape unit error reported by 2440 tape unit IOP Perform the "Powering Up the System" procedures in the <i>2440 Magnetic Tape Subsystem Service Guide</i> , G571-0166.	UH50003 DH50002 FI00830 FI00856
FFF6	Volume statistics; logged only	

Magnetic Tape Subsystem Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
DH50002	Tape unit	2440 Magnetic Tape Subsystem Operator's Manual, G571-0149

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Failing Item	Description	Document Description
MH50001	Tape	2440 Magnetic Tape Subsystem Operator's Manual, G571-0149
UH50003	Tape unit not communicating	2440 Magnetic Tape Subsystem Operator's Manual, G571-0149

(2621) SCSI I/O Processor Reference Codes

The SCSI I/O processor detected a failure.

1. Verify that the tape unit is powered on.
2. Clean the tape path as described in the service information for the specific tape unit.
3. Load the first tape.
4. Start a type D IPL from the system unit control panel.
5. Does the IPL complete successfully?

No Yes

↓ The problem has been corrected.

This ends the procedure.

6. Obtain another copy of the tape. Repeat steps 3 and 4 using the new tape. If this does not correct the problem, continue with step 7.
7. If the tape unit indicator panel shows an error condition, see the service information for the specific tape unit.
8. Find the unit reference code in the following table.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
00A1	I/O processor detected a buffer allocation error	AJEDA00 2621
09A2	I/O processor detected a recoverable system bus error No action required. This reference code is logged for information only.	
0A17	A permanent I/O processor failure occurred	2621 AJEDA00
0A18	I/O processor detected a random interrupt	2621 FI00884
0A20	I/O processor resource not available	FI00882 2621 AJEDA00
0A21	I/O processor detected a storage transfer error	2621 FI00884
0A22	I/O processor detected a storage transfer error	2621 AJEDA00
0A41	I/O processor parity error	2621
0AA3	A permanent I/O processor failure occurred	AJEDA00 2621
0AC9	I/O processor detected a buffer allocation error	AJEDA00 2621 ANYBUS

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0AD0	I/O processor detected a storage sequence error	AJEDA00 2621 ANYBUS
0AD1	A permanent I/O processor failure occurred	2621
1070	I/O processor memory error	2621 AJEDA00
1071	Problem with removable media, possibly a user error See the service information for the specific tape device.	MDMMEDA AJEDA00 FI00882
1072	I/O processor Licensed Internal Code error	AJEDA00
1073	I/O processor memory error No action required. This reference code is logged for information only.	
1074	Problem with removable media, possibly a user error See the service information for the specific tape device. If this does not correct the problem, ask your next level of support for assistance.	MDMMEDA
1075	I/O processor detected a buffer allocation error See the service information for the specific tape device.	AJEDA00 MDMMEDA
1076	I/O processor Licensed Internal Code error	AJEDA00
1077	EEPROM update occurred No action required. This reference code is logged for information only.	
107F	I/O processor Licensed Internal Code error	AJEDA00
1A03	I/O processor resource not available	AJEDA00 AJDG301
1A10	I/O processor resource not available The I/O processor error log is being filled faster than the errors are being reported to the system. Check other errors reported to the system and correct them.	2621 FI00884 DEVTERM EXTSCSI AJEDA00 BACKPLN
2800	I/O processor Licensed Internal Code error	AJEDA00
2806	A permanent I/O processor failure occurred	FI00120 2621
2808	I/O processor Licensed Internal Code error	AJEDA00
280A	A permanent I/O processor failure occurred	2621
2810	Device not ready during IPL	FI00882 AJEDA00 EXTSCSI 2621
2816	I/O processor Licensed Internal Code error	AJEDA00
281A	Removable media error during IPL	MDMMEDA 2621 FI00882
281E	Removable media error during IPL	MDMMEDA FI00882 2621
2820, 2900, 2904	I/O processor Licensed Internal Code error	AJEDA00

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
2906	I/O processor Licensed Internal Code error	MDMMEDA FI00884 AJEDA00 2621
290A, 2A00, 2A02	I/O processor Licensed Internal Code error	AJEDA00
2B00	System I/O bus error	FI00120 ANYBUS AJEDA00
2B02	System I/O bus error	FI00120 2621 ANYBUS AJEDA00
3000	A permanent I/O processor failure occurred	2621
3002	Tape/CD or disk device failed to respond to selection	FI00882 2621 FI01141 EXTSCSI
3005	Storage unit detected a media problem A blank tape was found, or the physical limits of the tape were reached because of a device error.	FI00882 2621 AJEDA00
3006	A permanent I/O processor failure occurred	2621 ANYBUS
300C to 300D	A tape/CD or disk device reported a failure	FI00882 2621
3010	A tape/CD or disk device reported a failure	FI00882 AJEDA00
3020	I/O processor detected a SCSI bus configuration error Use the FI codes to find failing devices. To correct or isolate a possible user error or configuration error, perform "SDIOP-PIP18" on page 429.	UDMUSER FI00882 FI00883 2621
3030	A tape/CD or disk device reported a failure	FI00882 2621
3031	Type of tape/CD or disk unit not known	FI00882 AJEDA00
3100	Tape/CD or disk bus interface error occurred	2621 FI00882 DEVTERM EXTSCSI FI00883
3110	A tape/CD or disk device reported a failure	FI00882 2621 EXTSCSI DEVTERM
3200	A tape/CD or disk device reported a failure	FI00882 MDMMEDA
3300	Storage unit detected a media problem See the service information for the specific tape device.	MDMMEDA FI00882 FI01141

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3400	Failure in initialization of a device task Perform "SDIOP-PIP18" on page 429.	FI00882 2621
3500	I/O processor Licensed Internal Code error	AJEDA00 2621
3501	I/O processor Licensed Internal Code error	AJEDA00
4003 to 4006	I/O processor Licensed Internal Code error	AJEDA00 2621
4030	Data decompression failure, I/O processor operational See the service information for the specific tape device.	MDMMEDA 2621
B300 to B301	A permanent I/O processor failure occurred	2621
B701	Read only storage failed, I/O processor is operational No action required. This reference code is logged for information only.	
B711	Control storage failed, I/O processor is operational No action required. This reference code is logged for information only.	
B720	A permanent I/O processor failure occurred	2621
B740	Reset of the I/O processor header failed	2621
B780	A permanent I/O processor failure occurred	2621 EXTSCSI
B783	Data compression failure, I/O processor operational	2621
B787	I/O processor detected an internal error	2621
B790	A permanent I/O processor failure occurred	2621
B791	I/O processor detected a recoverable device error No action required. This reference code is logged for information only.	
B7A2	Read only storage failed, I/O processor is operational No action required. This reference code is logged for information only.	
B980	Tape/CD or disk bus interface error occurred	2621 EXTSCSI FI00884 FI01141 DEVTERM
B981	Tape/CD or disk bus interface error occurred	EXTSCSI FI00884 2621 FI01141 DEVTERM
B982	I/O processor detected a storage device failure	FI00882 2621 EXTSCSI FI01141 DEVTERM

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
B983	Storage unit detected a media problem See the service information for the specific tape device.	MDMMEDA FI00882 FI00883 2621 EXTSCSI DEVTERM
B986	Tape/CD or disk bus interface error occurred	FI00882 EXTSCSI 2621 FI01141 DEVTERM
B98F	Type of tape/CD or disk unit not known See the specific device service information for details.	FI00882 AJEDA00
BB00	System bus error	2621 ANYBUS BACKPLN
BE01	I/O processor was not ready for interrupt that occurred	AJEDA00 2621
BE04	I/O processor Licensed Internal Code error	AJEDA00 2621
BE18	I/O processor detected a random interrupt	2621
BE1A	I/O processor was not ready for interrupt that occurred	2621 AJEDA00
BE1B	I/O processor was not ready for interrupt that occurred	AJEDA00 DEVTERM 2621 EXTSCSI FI00884
BE1C to BE1E	I/O processor was not ready for interrupt that occurred	AJEDA00 2621
BE40, BE48	A permanent I/O processor failure occurred	2621 AJEDA00
BE50	I/O processor detected a random interrupt	2621
BE51	I/O processor memory error	2621
BE52	I/O processor card or Licensed Internal Code error	2621 AJEDA00
BE53 to BE54	I/O processor Licensed Internal Code error	AJEDA00 2621
BE55	I/O processor memory error	2621
BE57	A permanent I/O processor failure occurred	2621
BE58	I/O processor detected a random interrupt	2621 AJEDA00
BE60	I/O processor detected a random interrupt	2621
FF3D	I/O processor detected an internal error	2621
FF4D, FF5D	I/O processor detected a recoverable SCSI bus error No action required. This reference code is logged for information only.	
FF6D	I/O processor detected a recoverable system bus error	2621 ANYBUS

SCSI I/O Processor Failing Items

Notes:

1. To determine the failing items, go to “Failing Items” on page 539.
2. To determine the associated part numbers, go to “Type, Model, and Part Number List” on page 750.
3. To determine the parts associated with symbolic FRUs, such as “ANYBUS”, or “DEVTERM”, go to “Symbolic FRUs” on page 559.

Failing Item	Description	Document Description
2621	I/O processor card	Repair and Parts; removal and installation procedures
AJDG301	Licensed Internal Code	Service Functions; APAR or LICTR
AJEDA00	I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
ANYBUS	IOP card bus error	Problem Analysis; Symbolic FRU Isolation
BACKPLN	Card Enclosure or Planar Board	Problem Analysis; Symbolic FRU Isolation
DEVTERM	Terminating plug	Problem Analysis; Symbolic FRU Isolation
EXTSCSI	Cable assembly	Problem Analysis; Symbolic FRU Isolation
MDMMEDA	Defective removable media	Refer to I/O device service information
UDMUSER	Operator/User Error	System operation information

(2624) Magnetic Storage I/O Processor Reference Codes

The magnetic storage I/O processor detected a failure.

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
00A1	I/O processor detected a buffer allocation error	AJEDA00 2624
09A2	I/O processor detected a recoverable system bus error No action required. This reference code is logged for information only.	
0A17	A permanent I/O processor failure occurred	2624 AJEDA00
0A18	I/O processor detected a random interrupt Perform “SDIOP-PIP13” on page 420.	2624 FI01107
0A20	I/O processor resource not available	FI01105 2624 AJEDA00
0A21	I/O processor detected a storage transfer error Perform “SDIOP-PIP13” on page 420.	2624 FI01107
0A22	I/O processor detected a storage transfer error	2624 AJEDA00

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0A41	I/O processor parity error	2624 FI01104
0AA3	A permanent I/O processor failure occurred	AJEDA00 2624
0AC9	I/O processor detected a buffer allocation error Perform "BUS-PIP Entry Point" on page 237.	AJEDA00 2624 FI00010 FI01104
0AD0	I/O processor detected a storage sequence error Perform "BUS-PIP Entry Point" on page 237.	AJEDA00 2624 FI00010 FI01104
0AD1	A permanent I/O processor failure occurred	2624 FI01104
1070	I/O processor memory error	2624 AJEDA00
1071	Problem with removable media, possibly a user error Perform "SDIOP-PIP1" on page 417.	MDNMEDA AJEDA00 FI01105
1072	I/O processor Licensed Internal Code error	AJEDA00
1073	I/O processor memory error No action required. This reference code is logged for information only.	
1074	Problem with removable media, possibly a user error Perform "SDIOP-PIP1" on page 417. If this does not correct the problem, ask your next level of support for assistance.	MDNMEDA
1075	I/O processor detected a buffer allocation error Perform "SDIOP-PIP1" on page 417.	AJEDA00 MDNMEDA
1076	I/O processor Licensed Internal Code error	AJEDA00
1077	EEPROM update occurred No action required. This reference code is logged for information only.	
107F	I/O processor Licensed Internal Code error	AJEDA00
1A03	I/O processor resource not available	AJEDA00 AJDG301
1A10	I/O processor resource not available The I/O processor error log is being filled faster than the errors are being reported to the system. Check other errors reported to the system and correct them.	2624 FI01104 FI01107 DEVTERM FI01140 AJEDA00 BACKPLN
3000	A permanent I/O processor failure occurred	2624
3002	Tape/CD or disk device failed to respond to selection Perform "SDIOP-PIP16" on page 423.	FI01105 2624 FI01106 FI01141 FI01140

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3006	A permanent I/O processor failure occurred Perform "BUS-PIP Entry Point" on page 237.	2624 FI00010
3020	I/O processor detected a SCSI bus configuration error Use the failing item (FI) codes to find failing devices. To correct or isolate a possible user error or configuration error, perform "SDIOP-PIP17" on page 426.	UDNUSER FI01105 FI01106 2624
3030	A tape/CD or disk device reported a failure	FI01105 2624
3031	Type of tape/CD or disk unit not known Ensure that the device indicated by FI01105 is supported by the system. If it is, exchange the FRUs, one at a time.	FI01105 AJEDA00
3100	Tape/CD or disk bus interface error occurred Perform "SDIOP-PIP13" on page 420.	2624 FI01105 DEVTERM FI01140 FI01106
3200	A tape/CD or disk device reported a failure	FI01105 MDNMEDA
3300	Storage unit detected a media problem Perform "SDIOP-PIP1" on page 417.	MDNMEDA FI00121 FI01141
3400	Failure in initialization of a device task Perform "SDIOP-PIP17" on page 426.	FI01105 2624
3500	I/O processor Licensed Internal Code error	AJEDA00 2624
3501	I/O processor Licensed Internal Code error	AJEDA00
4002 to 4003, 4006	I/O processor Licensed Internal Code error	AJEDA00 2624
4030	Data decompression failure, I/O processor operational Perform "SDIOP-PIP1" on page 417.	MDNMEDA 2624
B300 to B301	A permanent I/O processor failure occurred	2624 FI01104
B701	Read only storage failed, I/O processor is operational No action required. This reference code is logged for information only.	
B711	Control storage failed, I/O processor is operational No action required. This reference code is logged for information only.	
B720	A permanent I/O processor failure occurred	2624
B740	Reset of the I/O processor header failed	2624
B780	A permanent I/O processor failure occurred	2624 FI01140
B783	Data compression failure, I/O processor operational	2624
B787	I/O processor detected an internal error	2624
B790	A permanent I/O processor failure occurred	2624

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
B791	I/O processor detected a recoverable device error No action required. This reference code is logged for information only.	
B7A2	Read only storage failed, I/O processor is operational	
B940	Adapter card storage failure	FI01104 2624
B950	Adapter card storage or vital product data (VPD) failure	FI01104 2624
B960	Type of adapter card not known Ensure that the adapter card is supported by the system. If it is, exchange the FRUs, one at a time.	AJEDA00 FI01104
B980	Tape/CD or disk bus interface error occurred Perform "SDIOP-PIP13" on page 420.	2624 FI01140 FI01107 FI01141 DEVTERM
B981	Tape/CD or disk bus interface error occurred Perform "SDIOP-PIP16" on page 423.	FI01140 FI01107 2624 FI01141 DEVTERM
B982	I/O processor detected a storage device failure	FI01105 2624 FI01140 FI01141 DEVTERM
B983	Storage unit detected a media problem Perform "SDIOP-PIP1" on page 417.	MDNMEDA FI01105 FI01106 2624 FI01140 DEVTERM
B986	Tape/CD or disk bus interface error occurred	FI01105 FI01140 2624 FI01141 DEVTERM
B98F	Type of tape/CD or disk unit not known Ensure that the device indicated by FI01105 is supported by the system. If it is, exchange the FRUs, one at a time.	FI01105 AJEDA00
B9C5	Diskette automatic write/read wrap test failure	FI00122 2624
B9C7	I/O processor detected error in diskette control register	FI00122
B9C9	Diskette automatic write/read wrap test failure	FI01110 2624 FI00122 FI00142
BB00	System bus error Perform "BUS-PIP Entry Point" on page 237.	2624 FI00010 BACKPLN

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
BE01	I/O processor was not ready for interrupt that occurred	AJEDA00 2624 FI01104
BE04	I/O processor Licensed Internal Code error	AJEDA00 2624
BE18	I/O processor detected a random interrupt	FI01104 2624
BE1A	I/O processor was not ready for interrupt that occurred	2624 AJEDA00 FI00122
BE1B	I/O processor was not ready for interrupt that occurred Ask your next level of support if PTFs are available for the I/O processor licensed internal code. If so, apply them to the system. If this does not correct the problem, the I/O processor, its device interface, or an attached device may be causing the problem. If you suspect a hardware problem, perform "SDIOP-PIP13" on page 420.	AJEDA00 DEVTERM 2624 FI01140 FI01107
BE1C to BE1E	I/O processor was not ready for interrupt that occurred	AJEDA00 2624
BE40	A permanent I/O processor failure occurred	2624 AJEDA00
BE45 to BE46	Adapter card not communicating to I/O processor	FI01104 2624 AJEDA00
BE47	Adapter card not communicating to I/O processor Perform "BUS-PIP Entry Point" on page 237.	FI00122 2624 AJEDA00
BE48	A permanent I/O processor failure occurred	2624 AJEDA00
BE50	I/O processor detected a random interrupt	2624
BE51	I/O processor memory error	2624
BE52	I/O processor card or Licensed Internal Code error	AJEDA00 2624 FI01104
BE53 to BE54	I/O processor Licensed Internal Code error	AJEDA00 2624
BE55	I/O processor memory error	2624
BE56 to BE57	A permanent I/O processor failure occurred	2624
BE58	I/O processor detected a random interrupt	2624 AJEDA00
BE60	I/O processor detected a random interrupt	2624
FF3D	I/O processor detected an internal error	2624
FF6D	I/O processor detected a recoverable system bus error	2624 FI00010

Magnetic Storage I/O Processor Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
2624	I/O processor card	Repair and Parts; removal and installation procedures
AJDG301	Licensed Internal Code	Service Functions; APAR or LICTR
AJEDA00	I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
BACKPLN	Card enclosure or backplane	Problem Analysis; Symbolic FRU Isolation
DEVTERM	Terminating plug	Problem Analysis; Symbolic FRU Isolation
MDNMEDA	Defective removable media	System operation information
UDNUSER	Operator/User Error	System operation information

(2629, 2718, 2726, 2728, 2729, 2741, 2809, 2810, 2824, 282C, 6532, 6533, 6534, 671A) Reference Codes

1. If the error is reported on the control panel, the unit reference code is characters 5 through 8 of the top 16 character line of function 11. If the error is reported on the console, the unit reference code is the 4 rightmost characters of word 1.
2. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0A17	A permanent I/O processor failure occurred	IOP AJDGP01 STORIOA
0A22	I/O processor detected a storage transfer error	IOP AJDGP01 STORIOA
102E	Out of alternate sectors for disk storage	FI01105
1307	I/O processor resource not available	AJDGP01 AJDG301

2629, 2718, 2726, 2728, 2729, 2741, 2809, 2810, 2824, 282C, 6532, 6533, 6534, 671A

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1310	I/O processor resource not available The I/O processor error log is being filled faster than the errors are being reported to the system. Check other errors reported to the system and correct them.	IOP STORIOA FI01107 FI01104 AJDGP01 FI01140 ANYBUS CACHE
2200	I/O processor Licensed Internal Code error	AJDGP01
2201	Removable media error during IPL	USER FI01105
2202	Removable media error during IPL	FI00022 FI01105
3000	A permanent I/O processor failure occurred	STORIOA IOP
3002	Addressed device failed to respond to selection Perform "SDIOP-PIP16" on page 423.	FI01105 STORIOA FI01140 FI01141 FI01106
3006	System bus error	IOP ANYBUS STORIOA
3020	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 0. To correct or isolate a possible user error or configuration error, perform "SDIOP-PIP17" on page 426. Use the failing item (FI) codes to find failing devices.	USER FI01107 STORIOA
3021	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 1. To correct or isolate a possible user error or configuration error, perform "SDIOP-PIP17" on page 426. Use the failing item (FI) codes to find failing devices.	USER FI01107 STORIOA
3022	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 2. To correct or isolate a possible user error or configuration error, perform "SDIOP-PIP17" on page 426. Use the failing item (FI) codes to find failing devices.	USER FI01107 STORIOA
3080	I/O processor Licensed Internal Code error	AJDGP01 IOP STORIOA
3100	I/O processor card detected interface error Error occurred on SCSI bus 0. Perform "SDIOP-PIP13" on page 420.	STORIOA FI01107 FI01140 BACKPLN
3101	I/O processor card detected interface error Error occurred on SCSI bus 1. Perform "SDIOP-PIP13" on page 420.	STORIOA FI01107 FI01140 BACKPLN

2629, 2718, 2726, 2728, 2729, 2741, 2809, 2810, 2824, 282C, 6532, 6533, 6534, 671A

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3102	I/O processor card detected interface error Error occurred on SCSI bus 2. Perform "SDIOP-PIP13" on page 420.	STORIOA FI01107 FI01140 BACKPLN
3109	I/O processor timed out a device command Perform "SDIOP-PIP16" on page 423.	FI01105 STORIOA FI01140 BACKPLN FI01106
3110	I/O processor card detected interface error Perform "SDIOP-PIP16" on page 423.	FI01105 STORIOA FI01140 BACKPLN FI01106
3136	The removable media device is assigned elsewhere	USER FI01105
3200	A tape/CD or disk device reported a failure	FI01105 STORIOA IOP MEDIA
3203	Disk media format bad	FI01105
3205, 3215	Disk sector read error Disk unit data may need to be reloaded, but the disk unit does not need to be replaced.	FI01105
3250	Disk unit requires initialization before use. Perform a D-IPL and work on errors found in the log.	USER
3300	Storage unit detected a media problem Perform "SDIOP-PIP1" on page 417.	MEDIA FI00121 FI01141
3400	I/O processor card detected device error NOTE: If external devices are attached check EXTSCSI and DEVTERM first.	FI02112 STORIOA FI01106 DEVTERM FI01140
3401	Device backplane problem	DEVBPLN
3501	I/O processor Licensed Internal Code error	AJDGP01 IOP
3600 to 3601	System log entry only, no service action required	
6010	Any device attached to Bus 1	ANYBUS STORIOA
6070	A permanent I/O processor failure occurred	IOP
6071	I/O processor Licensed Internal Code error	AJDGP01
6072	I/O processor Licensed Internal Code error	AJDGP01 IOP
6073	I/O processor Licensed Internal Code error	MEDIA FI01105 USER
6075	I/O processor resource not available	AJDGP01

2629, 2718, 2726, 2728, 2729, 2741, 2809, 2810, 2824, 282C, 6532, 6533, 6534, 671A

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6076	I/O processor Licensed Internal Code error	AJDGP01 FI01105
6081 to 6083, 6085	I/O processor Licensed Internal Code error	AJDGP01 IOP
6602	An I/O processor Licensed Internal Code error occurred.	AJDGP01
8000	A permanent IOP or cache adaptor card failure occurred. Note: DO NOT replace both FRUs at the same time. Exchange the FRUs one at a time in the order shown.	STORIOA CACHE
8002	A permanent cache adaptor card failure occurred. Note: DO NOT replace both FRUs at the same time. Exchange the FRUs one at a time in the order shown.	CACHE STORIOA
8004	Voltage drop detected on I/O processor 5 volt power supply.	FI01141 STORIOA
8005	A recoverable IOP or cache adaptor card error occurred. Note: DO NOT replace both FRUs at the same time. Exchange the FRUs one at a time in the order shown.	STORIOA CACHE
8007	A recoverable cache adaptor card error occurred. Note: DO NOT replace both FRUs at the same time. Exchange the FRUs one at a time in the order shown.	CACHE STORIOA
8010 to 8011	A permanent cache adaptor card failure occurred. The cache adaptor card may be missing, broken or incompatible. Note: DO NOT replace both FRUs at the same time. Exchange the FRUs one at a time in the order shown.	CACHE STORIOA
8100	I/O processor Licensed Internal Code error	AJDGP01 IOP
8140	Temporary disk bus error A service action is recommended only if the Service Action Log contains an entry for this reference code. For more information about the Service Action Log, see "Hardware Service Manager" in the <i>AS/400 Service Functions</i> .	STORIOA FI01107 FI01140 BACKPLN
8141	Disk device detected recoverable error No action required. This reference code is logged for information only.	
8145	A recoverable I/O processor error occurred.	STORIOA
8146	Disk device detected recoverable error	FI01105
8150	A permanent I/O processor failure occurred	STORIOA IOP FI01107 ANYBUS
8151	I/O processor Licensed Internal Code error	AJDGP01 STORIOA
8155 to 8156	A permanent I/O processor failure occurred	AJDGP01 STORIOA
8200	I/O processor Licensed Internal Code error	AJDGP01 IOP

2629, 2718, 2726, 2728, 2729, 2741, 2809, 2810, 2824, 282C, 6532, 6533, 6534, 671A

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
8300	I/O processor card or Licensed Internal Code error A microprocessor exception occurred on the I/O processor.	STORIOA IOP AJDGP01
8301	Not valid condition in I/O Processor Licensed Internal Code The Licensed Internal Code found a condition that should not have occurred.	STORIOA AJDGP01 IOP
8400	I/O processor Licensed Internal Code error	AJDGP01
8ABF	System log entry only, no service action required	
9000 to 9001	I/O processor card detected device error	FI01105 STORIOA
9002	I/O processor card detected device error Perform "SDIOP-PIP16" on page 423.	FI01105 STORIOA FI01140 BACKPLN FI01106
9008	I/O card does not support functions expected by devices Perform "SDIOP-PIP25" on page 441.	SVCDOCS
9010	Cache data associated with attached devices cannot be found Perform "SDIOP-PIP19" on page 431.	SVCDOCS
9011	Cache data belongs to devices other than those attached Perform "SDIOP-PIP19" on page 431.	SVCDOCS
9012	IOP requires a cache adaptor card but cannot find it. The cache adapter card is missing or broken. Perform "SDIOP-PIP29" on page 448.	CACHE
9013	The IOP and attached cache adaptor card are not compatible. Perform "SDIOP-PIP19" on page 431.	SVCDOCS
9020 to 9021	Array not functional due to present hardware configuration. Perform "SDIOP-PIP20" on page 433.	SVCDOCS
9022 to 9024	Array not functional due to present hardware configuration. Perform "SDIOP-PIP22" on page 437.	SVCDOCS
9025	Disk unit is not supported at its physical location. Perform "SDIOP-PIP21" on page 436.	SVCDOCS
9026 to 9027	Array not functional due to present hardware configuration. Perform "SDIOP-PIP22" on page 437.	SVCDOCS
9028	Incorrect hardware configuration change has been detected. Reduce the number of arrays on IOP. Either move all devices in an array to another IOP that supports arrays, or stop an array on this IOP.	SVCDOCS
9029	Incorrect hardware configuration change has been detected. Contact your next level of support.	SVCDOCS

2629, 2718, 2726, 2728, 2729, 2741, 2809, 2810, 2824, 282C, 6532, 6533, 6534, 671A

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9030	Array no longer protected due to missing or failed disk unit Perform "SDIOP-PIP21" on page 436.	SVCDPCS
9031, 9040	Array protection temporarily suspended No action required. Protection will be automatically restarted.	
9041	Array protection temporarily suspended Protection will be automatically restarted. Call your next level of support to report the problem.	AJDGP01
9050	Required cache data cannot be located for a disk unit. Perform "SDIOP-PIP23" on page 438.	SVCDPCS
9051	IOP cache data exists for a missing or failed device. If all configured units are missing, a 9054 reference code may appear in the product activity log. If so, perform the action indicated for the 9054 reference code. Otherwise, perform "SDIOP-PIP27" on page 445.	SVCDPCS
9052	Cache data exists for device that has been modified. Perform "SDIOP-PIP28" on page 447.	SVCDPCS
9053	IOP resources not available due to previous problems. Take action on other IOP reference codes which have surfaced. If you cannot get to SST or DST, and cannot perform a type A or B IPL, perform a type D IPL from removable media. Look for Product Activity Log entries for other IOP reference codes and take action on them.	SVCDPCS
9054	IOP resources not available due to previous problems. 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 IOP reference codes and take action on them.	SVCDPCS
9081	I/O processor card detected device error	FI01105 STORIOA
9082	I/O processor card detected device error Perform "SDIOP-PIP16" on page 423.	FI01105 STORIOA FI01140 BACKPLN FI01106
9090	Disk unit has been modified after the last known status. Re-IPL the system. If any reference codes are surfaced, go to "Chapter 2. Unit Reference Codes" on page 17 and use the new reference code as the entry point to the problem. If you cannot resolve the problem, contact your next level of support.	SVCDPCS

2629, 2718, 2726, 2728, 2729, 2741, 2809, 2810, 2824, 282C, 6532, 6533, 6534, 671A

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9091	<p>Incorrect hardware configuration change has been detected.</p> <p>Re-IPL the system. If any reference codes are surfaced, go to "Chapter 2. Unit Reference Codes" on page 17 and use the new reference code as the entry point to the problem.</p> <p>If you cannot resolve the problem, contact your next level of support.</p>	SVDCOCS
9092	<p>Disk unit requires initialization before use.</p> <p>Perform "SDIOP-PIP26" on page 443.</p>	SVDCOCS
B300	A permanent I/O processor failure occurred	IOP
B3B1 to B3B6	<p>A permanent I/O processor failure occurred</p> <p>The only information available for this reference code is in function 11-3. The Direct Select Address of the MFIOP is 0001-01-00. Find the MFIOP for this system in "Expansion Tower Locations and Addresses" on page 687 and go to "Chapter 4. Removal and Installation Procedures" on page 593 to exchange the failing item.</p>	IOP
B3B7 to B3B8	<p>A permanent I/O processor failure occurred</p> <p>The only information available for this reference code is in function 11-3. The Direct Select Address of the MFIOP is 0001-01-00. Find the MFIOP for this system in "Expansion Tower Locations and Addresses" on page 687 and go to "Chapter 4. Removal and Installation Procedures" on page 593 to exchange the failing item.</p>	IOP STORIOA PCIBUS
B3B9	<p>A permanent I/O processor failure occurred</p> <p>The only information available for this reference code is in function 11-3. The Direct Select Address of the MFIOP is 0001-01-00. Find the MFIOP for this system in "Expansion Tower Locations and Addresses" on page 687 and go to "Chapter 4. Removal and Installation Procedures" on page 593 to exchange the failing item.</p>	IOP
B3E0	<p>I/O processor detected a fault condition.</p> <p>The only information available for this reference code is in function 11-3. The Direct Select Address of the MFIOP is 0001-01-00. Find the MFIOP for this system in "Expansion Tower Locations and Addresses" on page 687 and go to "Chapter 4. Removal and Installation Procedures" on page 593 to exchange the failing item.</p>	IOP
B3E1	<p>I/O processor detected a fault condition.</p> <p>The only information available for this reference code is in function 11-3. The Direct Select Address of the MFIOP is 0001-01-00. Find the MFIOP for this system in "Expansion Tower Locations and Addresses" on page 687 and go to "Chapter 4. Removal and Installation Procedures" on page 593 to exchange the failing item.</p>	IOP STORIOA PCIBUS
B410 to B411	A permanent I/O processor failure occurred	STORIOA
B412	<p>Tape/CD or disk bus interface error occurred</p> <p>Perform "SDIOP-PIP16" on page 423.</p>	FI01107 FI01140 STORIOA DEVTERM

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
B6D1	Service processor is in incorrect state during IPL The only information available for this reference code is in function 11-3. The Direct Select Address of the MFIOP is 0001-01-00. Find the MFIOP for this system in "Expansion Tower Locations and Addresses" on page 687 and go to "Chapter 4. Removal and Installation Procedures" on page 593 to exchange the failing item.	IOP
B6EF	System log entry only, no service action required	
B7E4 to B7E6	I/O processor detected errors in control panel interface	CTLPNL IOP
B7E8	Service processor time-of-day hardware failed	IOP
B900 to B901	A permanent I/O processor failure occurred	IOP AJDGP01
B902 to B903	A permanent communications or workstation IOA error occurred	FI01101 IOP AJDGP01
B904	A permanent I/O processor failure occurred	IOP AJDGP01
B934	Incompatible hardware detected.	STORIOA
B935	Unknown hardware detected	FI01101 AJDGP01 IOP BACKPLN
B9E8	Service processor time-of-day hardware failed	IOP
BE00	I/O processor detected a fault condition.	FI01104 AJDGP01 IOP
FF3D	I/O processor card	STORIOA IOP
FF6D	I/O processor detected a recoverable system bus error	IOP ANYBUS

Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
AJDG301	Licensed Internal Code	Service Functions; APAR or LICTR
AJDGP01	I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
ANYBUS	IOP card bus error	Problem Analysis; Symbolic FRU Isolation
BACKPLN	Card Enclosure or Planar Board	Problem Analysis; Symbolic FRU Isolation
CACHBAT	Cache battery pack	Problem Analysis; Symbolic FRU Isolation
CACHE	Cache adaptor card	Problem Analysis; Symbolic FRU Isolation

Failing Item	Description	Document Description
CMPRES1	Compressed device and compression IOA are not compatible	Problem Analysis; Symbolic FRU Isolation
CTLPNL	Control panel, or the interface to the Control panel	Problem Analysis; Symbolic FRU Isolation
DEVBPLN	Device backplane	Problem Analysis; Symbolic FRU Isolation
DEVTERM	Terminating plug	Problem Analysis; Symbolic FRU Isolation
IOP	I/O processor card	Problem Analysis; Symbolic FRU Isolation
MEDIA	Defective media	Problem Analysis; Symbolic FRU Isolation
PCIBUS	Any PCI card on the PCI bus	Problem Analysis; Symbolic FRU Isolation
STORIOA	Storage I/O adapter	Problem Analysis; Symbolic FRU Isolation
SVCDPCS	Customer engineer directed to system problem analysis	Problem Analysis; Symbolic FRU Isolation
USER	Operator/User Error	Problem Analysis; Symbolic FRU Isolation

(2644) Tape I/O Processor Reference Codes

The tape I/O processor detected a failure.

1. Verify that the tape unit is powered on.
2. Clean the tape path as described in the service information for the specific tape unit.
3. Load the first tape.
4. Start a type D IPL from the system unit control panel.
5. Does the IPL complete successfully?

No Yes

↓ The problem has been corrected.

This ends the procedure.

6. Obtain another copy of the tape. Repeat steps 3 and 4 using the new tape. If this does not correct the problem, continue with step 7.
7. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
8. If the tape unit indicator panel shows an error condition, see the service information for the specific tape unit.
9. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
00A1	I/O processor detected a buffer allocation error	AJEDA00 21F6085
09A2	I/O processor detected a recoverable system bus error	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0A17	I/O processor was not ready for interrupt that occurred	21F6085 AJEDA00
0A18	I/O processor detected a random interrupt	21F6085 FI00851 FI00850 FI00852
0A20	Tape I/O processor card, tape drive, or Lic Int Code error	FI00851 21F6085 AJEDA00
0A21	I/O processor detected a storage transfer error	21F6085 FI00851
0A22	I/O processor detected a storage transfer error	21F6085 AJEDA00
0A41	I/O processor parity error	21F6085
0AC9	I/O processor detected a buffer allocation error	AJEDA00 21F6085 FI00010
0AD0	I/O processor detected a storage sequence error	AJEDA00 21F6085 FI00010
0AD1	A permanent I/O processor failure occurred	21F6085
1070	I/O processor memory error	21F6085 AJEDA00
1071	Problem with removable media, possibly a user error	MDDTMED FI00851 AJEDA00
1072	I/O processor Licensed Internal Code error	AJEDA00
1073	I/O processor memory error	
1074	Problem with removable media, possibly a user error	MDDTMED
1075	I/O processor detected a buffer allocation error	AJEDA00 MDDTMED
1076	I/O processor Licensed Internal Code error	AJEDA00
1077	EEPROM update occurred	
107F	I/O processor Licensed Internal Code error	AJEDA00
1A03	I/O processor resource not available	AJEDA00 AJDG301
1A06	I/O processor card or Licensed Internal Code error	AJEDA00 21F6085
1A10	I/O processor resource not available The I/O processor error log has been filled. If it is possible to view the error log via DST or other system level methods, correct those errors in the error log before correcting this reference code and continuing. If there are no error log messages, exchange the failing items.	21F6085 FI00851 AJEDA00 FI00850 FI00852 FI00010 FI00853
2800	I/O processor detected an internal error	AJEDA00 21F6085
2806	System processor card or tape I/O processor card error	FI00120 21F6085

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
2808	I/O processor Licensed Internal Code error	AJEDA00
280A	Tape I/O processor card error	21F6085
2810	Device not ready during IPL Perform "TIOP-PIP1 (5077)" on page 467. Use the tape device service information to continue isolating the failure on the device attached to this tape I/O processor.	FI00851 AJEDA00 21F6085 FI00850 FI00852
2816	I/O processor Licensed Internal Code error	AJEDA00
281A	Tape too short	MDDTMED 21F6085 FI00851
281E	Wrong tape loaded or tape media error.	MDDTMED FI00851
2820, 2900, 2904, 2906, 290A, 2A00, 2A02	I/O processor Licensed Internal Code error	AJEDA00
2B00	System processor card or tape I/O processor card error	FI00120 FI00010 AJEDA00
2B02	System processor card or tape I/O processor card error	FI00120 21F6085 FI00010 AJEDA00
3000 to 3001, 3006, 3010	Tape I/O processor card error	21F6085
3090	Tape I/O Processor diagnostic detected S/370 interface error Perform "TIOP-PIP1 (5077)" on page 467. Note: If a channel wrap block is installed on the System/370 channel cable string and I/O processor basic assurance tests (BATS) were run, this SRC indicates that the diagnostic tests detected a failure.	FI00851 21F6085 FI00850 FI00852 FI00853
3100	I/O processor detected S/370 interface error Perform "TIOP-PIP1 (5077)" on page 467. Note: If a channel wrap block is installed on the System/370 channel cable string and I/O processor basic assurance tests (BATS) were run, this SRC indicates that the I/O processor and the System/370 channel cable string are not failing. This is a normal end indication that the diagnostic tests ran without error.	FI00851 FI00850 21F6085 FI00852 FI00853

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3110	<p>Device is not responding</p> <p>3422/3430 Tape Units:</p> <ul style="list-style-type: none"> • Verify that the control unit and the tape units attached to this tape I/O processor are powered on and that no error conditions are present. • Verify that the Channel Interface switches on the I/O device are set to the Enable position (for 3422) or to the On-line position (for 3430). • Verify that the CE mode switches on the I/O device and I/O device control unit are set to the Off position. <p>3480/3490 Tape Units:</p> <ul style="list-style-type: none"> • Verify that the control unit and the tape units attached to this tape I/O processor are powered on and that no error conditions are present: <ul style="list-style-type: none"> – For 3480 Tape Units: <ul style="list-style-type: none"> - The Local/Remote switch on the 3480 Control Unit is set to the Local position and the Power switch is set to the On position. – For 3490 Tape Units: <ul style="list-style-type: none"> - The 3490 Rack Unit Emergency Power Off switch is set to the On position. - Ensure that the 3490 Rack Enable/Off switch is set to the Enable position. - Press the 3490 Rack Power On button. • The Channel Enable/Disable switches are set to the Enable position. • The Normal/Test switch is set to the Normal position. • The control unit Online/Offline switch is set to the Online position. • The Drive Address Online/Offline switches are set to the Online position. • The Drive DC Power switches are set to the On position. <p>Use the tape device service information to continue isolating the failure on the device attached to this tape I/O processor.</p>	FI00851 UDDUSER
3120	<p>Disconnect-In active on S/370 interface; I/O error alert</p> <p>Perform “TIOP-PIP1 (5077)” on page 467.</p> <p>Use the tape device service information to continue isolating the failure on the device attached to this tape I/O processor.</p>	FI00851 21F6085 FI00850 FI00852 FI00853
3130	<p>I/O processor detected Bus-in parity check</p> <p>Perform “TIOP-PIP1 (5077)” on page 467.</p> <p>Use the tape device service information to continue isolating the failure on the device attached to this tape I/O processor.</p>	FI00851 21F6085 FI00850 FI00852 FI00853
3135	<p>Device busy condition could not be cleared</p> <p>If the control unit that is attached to this tape I/O processor has multiple channels attached to it, verify that the tape device is not being used by another system or I/O processor.</p> <p>Use the tape device service information to continue isolating the failure on the device attached to this tape I/O processor.</p>	UDDUSER FI00851 21F6085
3136	<p>The removable media device is assigned elsewhere</p> <p>Perform “TIOP-PIP5 (5077)” on page 469.</p>	UDDUSER FI00851 21F6085

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3140	Tape I/O processor card error	21F6085
3150	Device address-in/system address-out; mismatch Perform "TIOP-PIP1 (5077)" on page 467. Use the tape device service information to continue isolating the failure on the device attached to this tape I/O processor.	FI00851 21F6085 FI00850 FI00852
3170	Tape I/O processor card error	21F6085
3180	S/370 interface time-out error Use the tape device service information to continue isolating the failure on the device attached to this tape I/O processor. Perform "TIOP-PIP1 (5077)" on page 467.	FI00851 FI00850 FI00852 AJEDA00 FI00853 21F6085
3195	I/O configuration is not supported by this I/O processor Use the specific device service information to correct the problem. If this does not correct the problem, exchange the failing items.	FI00855 FI00851 21F6085
3196 to 3197	I/O configuration is not supported by this I/O processor	FI00855 FI00851 21F6085
3198	Tape Control Unit Channel type not supported on this IOP.	UDDUSR1
3199	User switched device type or model without IOP reset	UDDUSR2
3200	Device status; not permitted Not valid ending status, unexpected sense data, or an interrupt condition from the tape device that cannot be cleared was received. Perform "TIOP-PIP1 (5077)" on page 467.	FI00851 AJEDA00 21F6085
3202	I/O device detected word-count-0 error Perform "TIOP-PIP1 (5077)" on page 467.	FI00851 FI00850 FI00852 FI00853
3211	I/O device detected even parity on bus-out Perform "TIOP-PIP1 (5077)" on page 467.	21F6085 FI00851 FI00850 FI00852 FI00853
3212	I/O device rejected command Perform "TIOP-PIP1 (5077)" on page 467.	AJEDA00 FI00851
3214	I/O device detected overrun error Perform "TIOP-PIP1 (5077)" on page 467.	21F6085 FI00851 FI00850 FI00852 FI00853
4002, 4011 to 4012	Tape I/O Processor licensed internal code error.	AJEDA00
4013	Tape I/O Processor licensed internal code error.	AJEDA00 21F6085
4014	Tape I/O Processor licensed internal code error.	AJEDA00
4015	Tape I/O Processor licensed internal code error.	AJEDA00 21F6085

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4016	Tape I/O Processor licensed internal code error.	AJEHL00
B300 to B301	A permanent I/O processor failure occurred	21F6085
B701	Read only storage failed, I/O processor is operational No action required. This reference code is logged for information only.	
B711	Control storage failed, I/O processor is operational No action required. This reference code is logged for information only.	
B720	A permanent I/O processor failure occurred	21F6085
B740	Reset of the I/O processor header failed	21F6085
B7A2	Read only storage failed, I/O processor is operational	
BB00	Undetermined data error	21F6085 FI00010 FI00040
BE01	I/O processor was not ready for interrupt that occurred	AJEDA00 21F6085
BE04	I/O processor Licensed Internal Code error	AJEDA00 21F6085
BE18	I/O processor detected a random interrupt	21F6085
BE1A	I/O processor was not ready for interrupt that occurred	21F6085 AJEDA00
BE1B to BE1E	I/O processor was not ready for interrupt that occurred	AJEDA00 21F6085
BE40	A permanent I/O processor failure occurred	21F6085 AJEDA00
BE48	A permanent I/O processor failure occurred	21F6085
BE50	I/O processor detected a random interrupt	21F6085
BE51	I/O processor memory error	21F6085
BE52 to BE54	I/O processor Licensed Internal Code error	AJEDA00 21F6085
BE55	I/O processor memory error	21F6085
BE57	A permanent I/O processor failure occurred	21F6085
BE58	I/O processor detected a random interrupt	21F6085 AJEDA00
BE60	I/O processor detected a random interrupt	21F6085

Tape I/O Processor Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
21F6085	Tape I/O processor card	Repair and Parts; removal and installation procedures
AJDG301	Vertical Licensed Internal Code	Service Functions; APAR or LICTR
AJEDA00	Tape I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
AJEDA00	Tape I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
AJEDA00	Tape I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
AJEDA00	Tape I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
AJEHL00	Tape I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
MDDTMED	Tape	Magnetic tape subsystem operator's information
UDDUSER	Operator action required	Magnetic tape subsystem operator's information
UDDUSR1	Channel type set incorrectly	Magnetic tape subsystem operator's information
UDDUSR2	Operator action required	System operation information

(266A) Workstation Adapter Reference Codes

A workstation adapter failure occurred.

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0101	WS IOP detected error when transmitting data	FI00601 GAG7777 FI00631 AJLAG01
0103	WS IOP detected parity error from device	FI00601 GAG7777 FI00631 AJLAG01
0104	Device detected parity error from WS IOP	FI00601 GAG7777 FI00631 AJLAG01
0105	WS IOP detected error when transmitting data	FI00601 GAG7777 FI00631 AJLAG01
0106	WS IOP detected wrong data from device	FI00601 FI00631 GAG7777 AJLAG01

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0107	WS IOP detected wrong address from device	FI00601 GAG7777 AJLAG01
0108	WS IOP detected device power turned off, and then on	GAGEEEE FI00601
0109	WS IOP detected wrong device response to start command	FI00601 AJLAG01
0111	WS IOP detected wrong keyboard scan code from display	FI00601 AJLAG01
0120	Device detected wrong command or device ID from WS IOP	FI00601 AJLAG01
0121	Device detected not valid value from WS IOP	FI00601 AJLAG01
0122	Device detected storage or data overrun	FI00601 AJLAG01
0123	Device detected null or attribute exception error	FI00601 AJLAG01
0124	Device detected wrong start command from WS IOP	FI00601 AJLAG01
0125	WS IOP detected wrong exception response from device	FI00601 AJLAG01
0126	WS IOP detected not valid pass-through command	GAG9999 AJLAG01
0149	WS IOP detected wrong request or response from device	FI00601 AJLAG01
0190	WS IOP detected no status change from device	FI00601 GAG7777 AJLAG01
0191	WS IOP detected busy time-out from device	FI00601 AJLAG01
0201	WS IOP detected error when transmitting data	FI00604 GAG7777 FI00631 AJLAG01
0203	WS IOP detected parity error from device	FI00604 GAG7777 FI00631 AJLAG01
0204	Device detected parity error from WS IOP	FI00604 GAG7777 FI00631 AJLAG01
0205	WS IOP detected error when transmitting data	FI00604 GAG7777 FI00631 AJLAG01
0206	WS IOP detected wrong data from device	FI00604 FI00631 AJLAG01

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0207	WS IOP detected wrong address from device	FI00604 GAG7777 AJLAG01
0208	WS IOP detected device power turned off, and then on	GAGEEEE FI00604
0209	WS IOP detected wrong device response to start command	FI00604 AJLAG01
0210	Printer detected equipment error	FI00604
0211	Printer detected equipment error	FI00604 AJLAG01
0212	Printer detected equipment error	FI00604
0220	Device detected wrong command or device ID from WS IOP	FI00604 AJLAG01
0221	Device detected not valid value from WS IOP	FI00604 AJLAG01
0222	Device detected storage or data overrun	FI00604 AJLAG01
0223	WS IOP detected start command to printer was lost	FI00604 FI00631 AJLAG01
0224	Device detected wrong start command from WS IOP	FI00604 AJLAG01
0225	WS IOP detected wrong exception response from device	FI00604 AJLAG01
0230 to 0239, 0240 to 0248	Printer detected equipment error	FI00604
0249	WS IOP detected wrong request or response from device	FI00604 AJLAG01
0281, 0283 to 0289	Printer detected equipment error	FI00604
0290	WS IOP detected no status change from device	FI00604 AJLAG01
0291	WS IOP detected busy time-out from device	FI00604 AJLAG01
A000	Too many devices active on the workstation IOP	GAGBBBB
C000, D000	WS IOP error not known	AJLAG01
F000	WS IOP or IOA operating system program error	AJLAG01
F003	WS IOA buffer utilization threshold exceeded temporarily	AJLAG01
FFFF	User believes there is a problem Reference code FFFF is assigned by the ANZPRB (Analyze Problems) for user-detected errors. Run ANZPRB again if the problem still exists or look in the problem log (WRKPRB) for possible failing FRUs.	UAGFF00

Workstation Adapter Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.

2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
AJLAG01	Work Station IOP or IOA system Licensed Internal Code	Service Functions; APAR or LICTR
GAG7777	Electrical interference	
GAG9999	Error occurred with pass-through command	
GAGBBBB	Too many work stations are active on the workstation IOP	
GAGEEEE	Active device turned off	
UAGFF00	User believes there is a problem	

(2740, 2748) Reference Codes

1. If the error is reported on the control panel, the unit reference code is characters 5 through 8 of the top 16 character line of function 11. If the error is reported on the console, the unit reference code is the 4 rightmost characters of word 1.
2. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.
4. The 673x is a read cache. Perform all actions required for 673x as a disk drive and logic card except where separate 673x cache instructions are provided.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3006	System bus error	IOP ANYBUS STORIOA
3020	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 0. To correct or isolate a possible user error or configuration error, perform "SDIOP-PIP17" on page 426. Use the failing item (FI) codes to find failing devices.	USER FI01107 STORIOA
3021	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 1. To correct or isolate a possible user error or configuration error, perform "SDIOP-PIP17" on page 426. Use the failing item (FI) codes to find failing devices.	USER FI01107 STORIOA
3022	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 2. To correct or isolate a possible user error or configuration error, perform "SDIOP-PIP17" on page 426. Use the failing item (FI) codes to find failing devices.	USER FI01107 STORIOA

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3100	I/O processor card detected interface error Error occurred on SCSI bus 0. Perform "SDIOP-PIP13" on page 420.	STORIOA FI01107 FI01140 BACKPLN
3101	I/O processor card detected interface error Error occurred on SCSI bus 1. Perform "SDIOP-PIP13" on page 420.	STORIOA FI01107 FI01140 BACKPLN
3102	I/O processor card detected interface error Error occurred on SCSI bus 2. Perform "SDIOP-PIP13" on page 420.	STORIOA FI01107 FI01140 BACKPLN
3400	I/O processor card detected device error	FI02112 STORIOA FI01106 DEVTERM FI01140
3401	Device backplane problem	DEVBPLN
3501	I/O processor Licensed Internal Code error	AJDGP01 IOP
3600 to 3601	System log entry only, no service action required	
8008	A permanent cache battery pack failure occurred	CACHBAT STORIOA
8009	Impending cache battery pack failure	CACHBAT
8012	Attached read cache devices exceed capacity supported by IOA Reduce the number of read caches on the IOA.	SVCDOCS
8100	I/O processor Licensed Internal Code error	AJDGP01 IOP
8140	Temporary disk bus error A service action is recommended only if the Service Action Log contains an entry for this reference code. For more information about the Service Action Log, see "Hardware Service Manager" in the <i>AS/400 Service Functions</i> .	STORIOA FI01107 FI01140 BACKPLN
8141	Disk device detected recoverable error No action required. This reference code is logged for information only.	
8145	A recoverable I/O processor error occurred.	STORIOA
8146	Disk device detected recoverable error	FI01105
8150	A permanent I/O processor failure occurred	STORIOA IOP FI01107 ANYBUS
8151	I/O processor Licensed Internal Code error	AJDGP01 STORIOA
8155 to 8156	A permanent I/O processor failure occurred	AJDGP01 STORIOA

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
8200	I/O processor Licensed Internal Code error	AJDGP01 IOP
9000 to 9001	I/O processor card detected device error	FI01105 STORIOA
9002	I/O processor card detected device error Perform "SDIOP-PIP16" on page 423.	FI01105 STORIOA FI01140 BACKPLN FI01106
9008	I/O card does not support functions expected by devices Perform "SDIOP-PIP25" on page 441.	SVCDPCS
9010	Cache data associated with attached devices cannot be found Perform "SDIOP-PIP31" on page 450.	SVCDPCS
9011	Cache data belongs to devices other than those attached Perform "SDIOP-PIP32" on page 452.	SVCDPCS
9014	Mode jumper overridden due to cache data in conflicting mode See "Mode Jumper has been Overridden" on page 877.	SVCDPCS
9015	Mode jumper missing See "Mode Jumper is Missing" on page 878.	SVCDPCS
9020 to 9021	Array not functional due to present hardware configuration. Perform "SDIOP-PIP20" on page 433.	SVCDPCS
9022 to 9024	Array not functional due to present hardware configuration. Perform "SDIOP-PIP22" on page 437.	SVCDPCS
9025	Disk unit is not supported at its physical location. Perform "SDIOP-PIP21" on page 436.	SVCDPCS
9026 to 9027	Array not functional due to present hardware configuration. Perform "SDIOP-PIP22" on page 437.	SVCDPCS
9028	Incorrect hardware configuration change has been detected. Reduce the number of arrays on IOP. Either move all devices in an array to another IOP that supports arrays, or stop an array on this IOP.	SVCDPCS
9029	Incorrect hardware configuration change has been detected. Contact your next level of support.	SVCDPCS
9030	Array no longer protected due to missing or failed disk unit Perform "SDIOP-PIP21" on page 436.	SVCDPCS
9031, 9040	Array protection temporarily suspended No action required. Protection will be automatically restarted.	
9041	Array protection temporarily suspended Protection will be automatically restarted. Call your next level of support to report the problem.	AJDGP01

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9050	Required cache data cannot be located for a disk unit. Perform "SDIOP-PIP30" on page 449.	SVCDOS
9051	IOP cache data exists for a missing or failed device. If all configured units are missing, a 9054 reference code may appear in the product activity log. If so, perform the action indicated for the 9054 reference code. Otherwise, perform "SDIOP-PIP27" on page 445.	SVCDOS
9052	Cache data exists for device that has been modified. Contact your next level of support.	SVCDOS
9053	IOP resources not available due to previous problems. Take action on other IOP reference codes which have surfaced. If you cannot get to SST or DST, and cannot perform a type A or B IPL, perform a type D IPL from removable media. Look for Product Activity Log entries for other IOP reference codes and take action on them.	SVCDOS
9054	IOP resources not available due to previous problems. 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 IOP reference codes and take action on them.	SVCDOS
9081	I/O processor card detected device error	FI01105 STORIOA
9082	I/O processor card detected device error Perform "SDIOP-PIP16" on page 423.	FI01105 STORIOA FI01140 BACKPLN FI01106
9090	Disk unit has been modified after the last known status. Re-IPL the system. If any reference codes are surfaced, go to "Chapter 2. Unit Reference Codes" on page 17 and use the new reference code as the entry point to the problem. If you cannot resolve the problem, contact your next level of support.	SVCDOS
9091	Incorrect hardware configuration change has been detected. Re-IPL the system. If any reference codes are surfaced, go to "Chapter 2. Unit Reference Codes" on page 17 and use the new reference code as the entry point to the problem. If you cannot resolve the problem, contact your next level of support.	SVCDOS
9092	Disk unit requires initialization before use. Perform "SDIOP-PIP26" on page 443.	SVCDOS
9093	Read cache device not in correct format Contact your next level of support.	SVCDOS
B934	Incompatible hardware detected.	STORIOA

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
FF3D	I/O processor card	STORIOA IOP
FF6D	I/O processor detected a recoverable system bus error	IOP ANYBUS

Failing Items

Notes:

1. To determine the failing items, go to “Failing Items” on page 539.
2. To determine the associated part numbers, go to “Type, Model, and Part Number List” on page 750.
3. To determine the parts associated with symbolic FRUs, such as “ANYBUS”, or “DEVTERM”, go to “Symbolic FRUs” on page 559.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3006	System bus error	IOP ANYBUS STORIOA
3020	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 0. To correct or isolate a possible user error or configuration error, perform “SDIOP-PIP17” on page 426. Use the failing item (FI) codes to find failing devices.	USER FI01107 STORIOA
3021	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 1. To correct or isolate a possible user error or configuration error, perform “SDIOP-PIP17” on page 426. Use the failing item (FI) codes to find failing devices.	USER FI01107 STORIOA
3022	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 2. To correct or isolate a possible user error or configuration error, perform “SDIOP-PIP17” on page 426. Use the failing item (FI) codes to find failing devices.	USER FI01107 STORIOA
3100	I/O processor card detected interface error Error occurred on SCSI bus 0. Perform “SDIOP-PIP13” on page 420.	STORIOA FI01107 FI01140 BACKPLN
3101	I/O processor card detected interface error Error occurred on SCSI bus 1. Perform “SDIOP-PIP13” on page 420.	STORIOA FI01107 FI01140 BACKPLN
3102	I/O processor card detected interface error Error occurred on SCSI bus 2. Perform “SDIOP-PIP13” on page 420.	STORIOA FI01107 FI01140 BACKPLN
3400	I/O processor card detected device error	FI02112 STORIOA FI01106 DEVTERM FI01140
3401	Device backplane problem	DEVBPLN

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3501	I/O processor Licensed Internal Code error	AJDGP01 IOP
3600 to 3601	System log entry only, no service action required	
8008	A permanent cache battery pack failure occurred	CACHBAT STORIOA
8009	Impending cache battery pack failure	CACHBAT
8012	Attached read cache devices exceed capacity supported by IOA Reduce the number of read caches on the IOA.	SVCDOS
8100	I/O processor Licensed Internal Code error	AJDGP01 IOP
8140	Temporary disk bus error A service action is recommended only if the Service Action Log contains an entry for this reference code. For more information about the Service Action Log, see "Hardware Service Manager" in the <i>AS/400 Service Functions</i> .	STORIOA FI01107 FI01140 BACKPLN
8141	Disk device detected recoverable error No action required. This reference code is logged for information only.	
8145	A recoverable I/O processor error occurred.	STORIOA
8146	Disk device detected recoverable error	FI01105
8150	A permanent I/O processor failure occurred	STORIOA IOP FI01107 ANYBUS
8151	I/O processor Licensed Internal Code error	AJDGP01 STORIOA
8155 to 8156	A permanent I/O processor failure occurred	AJDGP01 STORIOA
8200	I/O processor Licensed Internal Code error	AJDGP01 IOP
9000 to 9001	I/O processor card detected device error	FI01105 STORIOA
9002	I/O processor card detected device error Perform "SDIOP-PIP16" on page 423.	FI01105 STORIOA FI01140 BACKPLN FI01106
9008	I/O card does not support functions expected by devices Perform "SDIOP-PIP25" on page 441.	SVCDOS
9010	Cache data associated with attached devices cannot be found Perform "SDIOP-PIP31" on page 450.	SVCDOS
9011	Cache data belongs to devices other than those attached Perform "SDIOP-PIP32" on page 452.	SVCDOS
9014	Mode jumper overridden due to cache data in conflicting mode See "Mode Jumper has been Overridden" on page 877.	SVCDOS

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9015	Mode jumper missing See "Mode Jumper is Missing" on page 878.	SVCDPCS
9020 to 9021	Array not functional due to present hardware configuration. Perform "SDIOP-PIP20" on page 433.	SVCDPCS
9022 to 9024	Array not functional due to present hardware configuration. Perform "SDIOP-PIP22" on page 437.	SVCDPCS
9025	Disk unit is not supported at its physical location. Perform "SDIOP-PIP21" on page 436.	SVCDPCS
9026 to 9027	Array not functional due to present hardware configuration. Perform "SDIOP-PIP22" on page 437.	SVCDPCS
9028	Incorrect hardware configuration change has been detected. Reduce the number of arrays on IOP. Either move all devices in an array to another IOP that supports arrays, or stop an array on this IOP.	SVCDPCS
9029	Incorrect hardware configuration change has been detected. Contact your next level of support.	SVCDPCS
9030	Array no longer protected due to missing or failed disk unit Perform "SDIOP-PIP21" on page 436.	SVCDPCS
9031, 9040	Array protection temporarily suspended No action required. Protection will be automatically restarted.	
9041	Array protection temporarily suspended Protection will be automatically restarted. Call your next level of support to report the problem.	AJDGP01
9050	Required cache data cannot be located for a disk unit. Perform "SDIOP-PIP30" on page 449.	SVCDPCS
9051	IOP cache data exists for a missing or failed device. If all configured units are missing, a 9054 reference code may appear in the product activity log. If so, perform the action indicated for the 9054 reference code. Otherwise, perform "SDIOP-PIP27" on page 445.	SVCDPCS
9052	Cache data exists for device that has been modified. Contact your next level of support.	SVCDPCS
9053	IOP resources not available due to previous problems. Take action on other IOP reference codes which have surfaced. If you cannot get to SST or DST, and cannot perform a type A or B IPL, perform a type D IPL from removable media. Look for Product Activity Log entries for other IOP reference codes and take action on them.	SVCDPCS

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9054	IOP resources not available due to previous problems. 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 IOP reference codes and take action on them.	SVCDOS
9081	I/O processor card detected device error	FI01105 STORIOA
9082	I/O processor card detected device error Perform "SDIOP-PIP16" on page 423.	FI01105 STORIOA FI01140 BACKPLN FI01106
9090	Disk unit has been modified after the last known status. Re-IPL the system. If any reference codes are surfaced, go to "Chapter 2. Unit Reference Codes" on page 17 and use the new reference code as the entry point to the problem. If you cannot resolve the problem, contact your next level of support.	SVCDOS
9091	Incorrect hardware configuration change has been detected. Re-IPL the system. If any reference codes are surfaced, go to "Chapter 2. Unit Reference Codes" on page 17 and use the new reference code as the entry point to the problem. If you cannot resolve the problem, contact your next level of support.	SVCDOS
9092	Disk unit requires initialization before use. Perform "SDIOP-PIP26" on page 443.	SVCDOS
9093	Read cache device not in correct format Contact your next level of support.	SVCDOS
B934	Incompatible hardware detected.	STORIOA
FF3D	I/O processor card	STORIOA IOP
FF6D	I/O processor detected a recoverable system bus error	IOP ANYBUS

(2746) Twinaxial Workstation Adapter Reference Codes

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Look at the 8 characters of word 3. These 8 characters are the direct select address of the card (BBBBCbba). The unit address portion of the card address is the 8 characters of word 4. Card locations can be found using the 16 character address. See "Chapter 6. Data Recovery Procedures and General System Information" on page 837.
3. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to “Failing Items” on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to “Type, Model, and Part Number List” on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to “Symbolic FRUs” on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
B904	I/O adapter Licensed Internal Code failed.	AJDGP01 FI00719
B934	Incompatible hardware detected.	FI00719 FI00718
B940	I/O adapter hardware error detected	FI00719 FI00718 AJDGP01
B941 to B942	One half of I/O adapter failed.	FI00719 FI00718 AJDGP01

Workstation Adapter Failing Items

Notes:

1. To determine the failing items, go to “Failing Items” on page 539.
2. To determine the associated part numbers, go to “Type, Model, and Part Number List” on page 750.
3. To determine the parts associated with symbolic FRUs, such as “ANYBUS”, or “DEVTERM”, go to “Symbolic FRUs” on page 559.

Failing Item	Description	Document Description
AJDGP01	Licensed Internal Code	Service Functions; APAR or LICTR

(283C, 283D) Device Backplane Reference Codes

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Look at the 8 characters of word 3. These 8 characters are the direct select address of the card (BBBBCcbb). The unit address portion of the card address is the 8 characters of word 4. Card locations can be found using the 16 character address. See “Chapter 6. Data Recovery Procedures and General System Information” on page 837.
3. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to “Failing Items” on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to “Type, Model, and Part Number List” on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to “Symbolic FRUs” on page 559 to determine the part number.

283C, 283D

- The 673x is a read cache. Perform all actions required for 673x as a disk drive and logic card except where separate 673x cache instructions are provided.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3002	Addressed device backplane failed to respond to selection	DEVBPLN STORIOA FI01140 FI01106
3109	I/O adapter timed out a device backplane command	DEVBPLN STORIOA FI01140 FI01106
8401	Removable media power fault	DEVBPLN
FFF4	Device backplane problem	DEVBPLN STORIOA FI01140 FI01106

Failing Items

Notes:

- To determine the failing items, go to "Failing Items" on page 539.
- To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
- To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
BACKPLN	Card enclosure or backplane	Problem Analysis; Symbolic FRU Isolation
CMPRES1	Compressed device and compression IOA are not compatible	Problem Analysis; Symbolic FRU Isolation
DEVBPLN	Device backplane	Problem Analysis; Symbolic FRU Isolation
DEVTERM	Device terminator	Problem Analysis; Symbolic FRU Isolation
DISKDRV	Disk drive and logic card	Problem Analysis; Symbolic FRU Isolation
STORIOA	Storage I/O adapter	Problem Analysis; Symbolic FRU Isolation
SVCDOCS	Customer engineer directed to system problem analysis	Problem Analysis; Symbolic FRU Isolation

(3422) Tape Unit Reference Codes

A tape or a 3422 Tape Unit failure occurred.

Note: For tape device and IOP reset procedures, see "TU-PIP4" on page 505.

- Is the operating system available and can you enter commands from the command line?

Yes No

↓ Go to step 3 of this procedure.

- Is OS/400 available on the system (see "Determining the Dominant Operating System" in the *AS/400 Service Functions*)?

No Yes

↓ Use the online problem analysis procedures to isolate the problem. Use the WRKPRB (Work with Problem) command to determine if a recent problem was entered in the problem log, or use the VFYTAP (Verify Tape) command to run verification tests.

3. Verify that the 3422 is powered on.
4. Verify that the Enable/Disable switches are set to the Enable position.
5. Clean the tape path as described in the 3422 service information.
6. Load the first tape.
7. Start a type D IPL from the system unit control panel.
Does the IPL complete successfully?

No Yes

↓ The problem has been corrected.

This ends the procedure.

8. Obtain another copy of the tape. Repeat steps 6 and 7 using the new tape. If this does not correct the problem, continue with step 9.
9. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
10. If the 3422 indicator panel shows an error condition, see the 3422 service information.
11. Look at the Data display for word 9:
 - The 3 leftmost characters are the fault system code (FSC) from the sense bytes of the failing device. The device FSCs are in the 3422 service information.
12. Look at the Data display for word 3:
 - The 4 rightmost characters are the direct select address.
13. Look at the Data display for word 4:
 - The second character is the 3422 control unit address.
 - The fourth character is the 3422 drive address that has the error.
14. See the 3422 service information with the FSC.
15. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to “Failing Items” on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to “Type, Model, and Part Number List” on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to “Symbolic FRUs” on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
2001	Tape path dirty or write data check error Clean the tape path using the cleaning procedures in the <i>3422 Magnetic Tape Subsystem Operator's Guide</i> , GA32-0090. Use the 3422 Tape Unit service information to continue analyzing the problem.	MH30001 FI00851

3422

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
2003	<p>Tape path dirty or write identification record error</p> <p>Clean the tape path using the cleaning procedures in the <i>3422 Magnetic Tape Subsystem Operator's Guide</i>, GA32-0090.</p> <p>Use the 3422 Tape Unit service information to continue analyzing the problem.</p>	MH30001 FI00851
2008	<p>Tape path dirty or read data check error</p> <p>Clean the tape path using the cleaning procedures in the <i>3422 Magnetic Tape Subsystem Operator's Guide</i>, GA32-0090.</p> <p>Use the 3422 Tape Unit service information to continue analyzing the problem.</p>	MH30001 FI00851
2009	<p>Tape path dirty or read identification record error</p> <p>Clean the tape path using the cleaning procedures in the <i>3422 Magnetic Tape Subsystem Operator's Guide</i>, GA32-0090.</p> <p>Use the 3422 Tape Unit service information to continue analyzing the problem.</p>	MH30001 FI00851
2014	<p>Recoverable tape unit failure; logged only</p> <p>No action required. This reference code is logged for information only.</p>	
2015	<p>Tape unit failure</p> <p>Clean the tape path using the cleaning procedures in the <i>3422 Magnetic Tape Subsystem Operator's Guide</i>, GA32-0090.</p> <p>Use the 3422 Tape Unit service information to continue analyzing the problem.</p>	FI00851 21F6085 FI00850 62X3421
2017	<p>Write Protect violation reported by tape unit; logged only</p> <p>No action required. This reference code is logged for information only.</p>	
FFD5	<p>Device error reported; tape I/O processor</p> <p>Verify that the CE mode switch in the device control unit is set to the Off position.</p> <p>Verify that power is switched on in the 3422 A01 Tape Unit and that the Enable/Disable switch on the tape unit is set to the Enable position.</p> <p>If you are attempting to perform an IPL from the device that had the error, verify that the device has an address of hexadecimal 70.</p> <p>Use the 3422 Tape Unit service information to continue analyzing the problem.</p>	UH30003 FI00851
FFF6	<p>Volume statistics; logged only</p> <p>No action required. This reference code is logged for information only.</p>	

Tape Unit Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.

3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
21F6085	Tape I/O processor card	Repair and Parts; removal and installation procedures
62X3421	External signal cable	Repair and Parts; removal and installation procedures
MH30001	Tape	Magnetic tape subsystem operator's information
UH30003	I/O device not communicating	Magnetic tape subsystem operator's information

(3430) Tape Unit Reference Codes

A tape or a 3430 Tape Unit failure occurred.

Note: For tape device and IOP reset procedures, see "TU-PIP4" on page 505.

1. Is the operating system available and can you enter commands from the command line?

Yes No

↓ Go to step 3 of this procedure.

2. Is OS/400 available on the system (see "Determining the Dominant Operating System" in the *AS/400 Service Functions*)?

No Yes

↓ Use the online problem analysis procedures to isolate the problem. Use the WRKPRB (Work with Problem) command to determine if a recent problem was entered in the problem log, or use the VFYTAP (Verify Tape) command to run verification tests.

3. Verify that the 3430 is powered on.
4. Verify that the 3430 Online/Offline switch is set to the Online position.
5. Clean the tape path as described in the 3430 service information.
6. Load the first tape.
7. Start a type D IPL from the system unit control panel.
Does the IPL complete successfully?

No Yes

↓ The problem has been corrected.

This ends the procedure.

8. Obtain another copy of the tape. Repeat steps 6 and 7 using the new tape. If this does not correct the problem, continue with step 9.
9. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
10. If the 3430 indicator panel shows an error condition, see the 3430 service information.
11. Look at the Data display for word 9:
 - The 2 leftmost characters are the fault symptom code (FSC) and the third character is the FSC pointer from the sense bytes of the failing device. The device FSCs are in the 3430 service information.
12. Look at the Data display for word 3:

- The 4 rightmost characters are the direct select address.
13. Look at the Data display for word 4:
- The second character is the 3430 control unit address.
 - The fourth character is the 3430 drive address that has the error.
14. See the 3430 service information with the FSC.
15. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to “Failing Items” on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to “Type, Model, and Part Number List” on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to “Symbolic FRUs” on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
2001	Tape path dirty or write data check error Clean the tape path using the cleaning procedures in the <i>3430 Magnetic Tape Subsystem Operator's Guide, GA32-0079</i> . Use the 3430 Tape Unit service information to continue analyzing the problem.	MH40001 FI00851
2003	Tape path dirty or write identification record error Clean the tape path using the cleaning procedures in the <i>3430 Magnetic Tape Subsystem Operator's Guide, GA32-0079</i> . Use the 3430 Tape Unit service information to continue analyzing the problem.	MH40001 FI00851
2008	Tape path dirty or read data check error Clean the tape path using the cleaning procedures in the <i>3430 Magnetic Tape Subsystem Operator's Guide, GA32-0079</i> . Use the 3430 Tape Unit service information to continue analyzing the problem.	MH40001 FI00851
2009	Tape path dirty or read identification record error Clean the tape path using the cleaning procedures in the <i>3430 Magnetic Tape Subsystem Operator's Guide, GA32-0079</i> . Use the 3430 Tape Unit service information to continue analyzing the problem.	MH40001 FI00851
2014	Recoverable tape unit failure; logged only No action required. This reference code is logged for information only.	
2015	Tape unit failure Clean the tape path using the cleaning procedures in the <i>3430 Magnetic Tape Subsystem Operator's Guide, GA32-0079</i> . Use the 3430 Tape Unit service information to continue analyzing the problem.	FI00851 21F6085 FI00850 62X3421
2017	Write Protect violation reported by tape unit; logged only No action required. This reference code is logged for information only.	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
FFD5	<p>Device error reported; tape I/O processor</p> <p>Verify that the CE mode switches in both device control units in the device are set to the Off position.</p> <p>Verify that power is switched on in the 3430 A01 Tape Unit and that the On-line/Off-line switch on the tape unit is set to the On-line position.</p> <p>If you are attempting to perform an IPL from the device that had the error, verify that the device has an address of hexadecimal 70.</p> <p>Use the 3430 Tape Unit service information to continue analyzing the problem.</p>	UH40003 FI00851
FFF6	<p>Volume statistics; logged only</p> <p>No action required. This reference code is logged for information only.</p>	

Tape Unit Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
21F6085	Tape I/O processor card	Repair and Parts; removal and installation procedures
62X3421	External signal cable	Repair and Parts; removal and installation procedures
MH40001	Tape	Magnetic tape subsystem operator's information
UH40003	I/O device not communicating	Magnetic tape subsystem operator's information

(3480) Tape Unit Reference Codes

A tape or a 3480 Tape Unit failure occurred.

Note: For tape device and IOP reset procedures, see "TU-PIP4" on page 505.

1. Is the operating system available and can you enter commands from the command line?

Yes No

↓ Go to step 3 of this procedure.

2. Is OS/400 available on the system (see "Determining the Dominant Operating System" in the *AS/400 Service Functions*)?

No Yes

↓ Use the online problem analysis procedures to isolate the problem. Use the WRKPRB (Work with Problem) command to determine if a recent problem was entered in the problem log, or use the VFYTAP (Verify Tape) command to run verification tests.

3. Verify that the 3480 is powered on.
4. Verify that the channel Enable/Disable switches are set to the Enable position.
5. Verify that the 3480 Online/Offline switches are set to the Online position.
6. Clean the tape path as described in the 3480 service information.
7. Load the first tape.
8. Start a type D IPL from the system unit control panel.
Does the IPL complete successfully?

No Yes

↓ The problem has been corrected.

This ends the procedure.

9. Obtain another copy of the tape. Repeat steps 7 and 8 using the new tape. If this does not correct the problem, continue with step 10.
10. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
11. If the 3480 indicator panel shows a check (CHK) code, see the "Start" section of the 3480 service information.
12. Look at the Data display for word 3:
 - The 4 rightmost characters are the direct select address.
13. Look at the Data display for word 4:
 - The second character is the 3480 control unit address.
 - The fourth character is the 3480 drive address that has the error.
14. Find the unit reference code in the following table.
15. See the "Start" section of the 3480 service information.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
2001	Tape path dirty or write data check error Clean the tape path using the cleaning procedures in the <i>3480 Magnetic Tape Subsystem Operator's Guide, GA32-0066</i> . Use the 3480 Tape Unit service information to continue analyzing the problem.	MHD0001 FI00851
2003	Tape path dirty or write identification record error Clean the tape path using the cleaning procedures in the <i>3480 Magnetic Tape Subsystem Operator's Guide, GA32-0066</i> . Use the 3480 Tape Unit service information to continue analyzing the problem.	MHD0001 FI00851

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
2008	<p>Tape path dirty or read data check error</p> <p>Clean the tape path using the cleaning procedures in the <i>3480 Magnetic Tape Subsystem Operator's Guide</i>, GA32-0066.</p> <p>Use the 3480 Tape Unit service information to continue analyzing the problem.</p>	MHD0001 FI00851
2009	<p>Tape path dirty or read identification record error</p> <p>Clean the tape path using the cleaning procedures in the <i>3480 Magnetic Tape Subsystem Operator's Guide</i>, GA32-0066.</p> <p>Use the 3480 Tape Unit service information to continue analyzing the problem.</p>	MHD0001 FI00851
2014	<p>Recoverable tape unit failure; logged only</p> <p>No action required. This reference code is logged for information only.</p>	
2015	<p>Tape unit failure</p> <p>Clean the tape path using the cleaning procedures in the <i>3480 Magnetic Tape Subsystem Operator's Guide</i>, GA32-0066.</p> <p>Use the 3480 Tape Unit service information to continue analyzing the problem.</p>	FI00851 21F6085 FI00850 62X3421
2017	<p>Write Protect violation reported by tape unit; logged only</p> <p>No action required. This reference code is logged for information only.</p>	
FFD5	<p>Device error reported; tape I/O processor</p> <p>Verify the following:</p> <ol style="list-style-type: none"> 1. The Local/Remote switch on the 3480 Control Unit is set to the Local position. 2. The 3480 Control Unit Emergency Power Off switch is set to the Power Enable position. 3. The Channel Enable/Disable switches on the 3480 Control Unit are set to the Enable position. 4. The Normal/Test switch on the 3480 Control Unit is set to the Normal position. 5. The CU Online/CU Offline switch on the 3480 Control Unit is set to the CU Online position. 6. The Drive Online/Offline switches on the 3480 Tape Unit are set to the Online position. 7. The Drive DC Power switches on the 3480 Tape Unit are set to the On position. <p>If you are attempting to perform an IPL from the device that had the error, verify that the 3480 Control Unit has an address of hexadecimal 7 and the 3480 Tape Unit has an address of 0.</p> <p>Use the 3480 Tape Unit service information to continue analyzing the problem.</p>	UHD0003 FI00851
FFF6	<p>Volume statistics; logged only</p> <p>No action required. This reference code is logged for information only.</p>	

Tape Unit Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
21F6085	Tape I/O processor card	Repair and Parts; removal and installation procedures
62X3421	External signal cable	Repair and Parts; removal and installation procedures
MHD0001	Tape	Magnetic tape subsystem operator's information
UHD0003	I/O device not communicating	Magnetic tape subsystem operator's information

(3490) Tape Unit Reference Codes

A tape or a 3490 Tape Unit failure occurred.

Note: For tape device and IOP reset procedures, see "TU-PIP4" on page 505.

1. Is the operating system available and can you enter commands from the command line?

Yes No

↓ Go to step 3 of this procedure.

2. Is OS/400 available on the system (see "Determining the Dominant Operating System" in the *AS/400 Service Functions*)?

No Yes

↓ Use the online problem analysis procedures to isolate the problem. Use the WRKPRB (Work with Problem) command to determine if a recent problem was entered in the problem log, or use the VFYTAP (Verify Tape) command to run verification tests.

3. Verify that the 3490 is powered on.
4. Verify that the channel Enable/Disable switches are set to the Enable position.
5. Verify that the 3490 Online/Offline switches are set to the Online position.
6. Load the first tape.
7. Start a type D IPL from the system unit control panel.
Does the IPL complete successfully?

No Yes

↓ The problem has been corrected.

This ends the procedure.

8. Obtain another copy of the tape. Repeat steps 6 and 7 using the new tape. If this does not correct the problem, continue with step 9.
9. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.

10. If the 3490 indicator panel shows a check (CHK) code or an error code, see the "Start" section of the 3490 service information.
11. Look at the Data display for word 3:
 - The 4 rightmost characters are the direct select address.
12. Look at the Data display for word 4:
 - The second character is the 3490 control unit address.
 - The fourth character is the 3490 drive address that has the error.
13. Find the unit reference code in the following table.
14. See the "Start" section of the 3490 service information.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0xxx, 1xxx, 2000	Tape unit failure Use online problem analysis and the 3490 Tape Unit service information to analyze the problem.	
2001	Tape path dirty or write data check error Clean the tape path using the cleaning procedures in the <i>3490 Magnetic Tape Subsystem Operator's Guide</i> , GA32-0124. Use the 3490 Tape Unit service information to continue analyzing the problem.	MHK0001 DHK0002
2003	Tape path dirty or write identification record error Clean the tape path using the cleaning procedures in the <i>3490 Magnetic Tape Subsystem Operator's Guide</i> , GA32-0124. Use the 3490 Tape Unit service information to continue analyzing the problem.	MHK0001 DHK0002
2008	Tape path dirty or read data check error Clean the tape path using the cleaning procedures in the <i>3490 Magnetic Tape Subsystem Operator's Guide</i> , GA32-0124. Use the 3490 Tape Unit service information to continue analyzing the problem.	MHK0001 DHK0002
2009	Tape path dirty or read identification record error Clean the tape path using the cleaning procedures in the <i>3490 Magnetic Tape Subsystem Operator's Guide</i> , GA32-0124. Use the 3490 Tape Unit service information to continue analyzing the problem.	MHK0001 DHK0002
2010	Tape unit failure Use online problem analysis and the 3490 Tape Unit service information to continue analyzing the problem.	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
2014	Recoverable tape unit failure; logged only No action required. This reference code is logged for information only.	
2015	Tape unit failure Clean the tape path using the cleaning procedures in the <i>3490 Magnetic Tape Subsystem Operator's Guide, GA32-0124</i> . Use the 3490 Tape Unit service information to continue analyzing the problem.	DHK0002 FI00856 FI00845
2017	Write Protect violation reported by tape unit; logged only No action required. This reference code is logged for information only.	
202x, 205x, 206x, 21xx, 22xx	Tape unit failure Use online problem analysis and the 3490 Tape Unit service information to continue analyzing the problem.	
23xx	Tape Library failure Use the 3494 Tape Library Dataserver Maintenance Information to analyze the problem.	
26xx, 27xx, 3xxx, 4xxx, 5xxx, 6xxx, 7xxx, 8xxx	Tape unit failure Use online problem analysis and the 3490 Tape Unit service information to continue analyzing the problem.	
9020	I/O processor detected a SCSI bus configuration error Before exchanging any parts, verify that the following conditions are not present: <ul style="list-style-type: none"> • Tape and DASD devices attached to the same type 6501 I/O processor • A device type or model that is not given support 	UHKCNFG FI00851 FI00130
9100	Interface error detected by I/O processor or by tape unit Before exchanging any parts, do the following: <ol style="list-style-type: none"> 1. Ensure that an interposer is connected between the I/O processor and the SCSI cable. 2. Ensure that the SCSI cable between the interposer and the device is seated correctly, and that there are no bent or damaged pins on the SCSI cable. 3. Ensure that a terminating plug is attached to the device end of the SCSI cable. 	FI00851 FI00856 05H3834 EXTSCSI 61G8324

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9200	I/O processor addressed the tape unit; no response Before exchanging any parts, do the following: <ol style="list-style-type: none"> 1. Ensure that the device is powered on. 2. Ensure that an interposer is connected between the I/O processor and the SCSI cable. 3. Ensure that the SCSI cable between the interposer and the device is seated correctly, and that there are no bent or damaged pins on the SCSI cable. 4. Ensure that a terminating plug is attached to the device end of the SCSI cable. 	FI00851 FI00856 05H3834 EXTSCSI 61G8324
9201	Tape unit command timeout Before exchanging any parts, do the following: <ol style="list-style-type: none"> 1. Ensure that the device is powered on. 2. Ensure that an interposer is connected between the I/O processor and the SCSI cable. 3. Ensure that the SCSI cable between the interposer and the device is seated correctly, and that there are no bent or damaged pins on the SCSI cable. 4. Ensure that a terminating plug is attached to the device end of the SCSI cable. 	FI00851 FI00856 05H3834 EXTSCSI 61G8324
9210	Illegal or unsupported tape unit response	FI00851 FI00856 FI00130
9300	Tape unit failure	DHK0002
9301	Tape device failure, redundancy lost The tape unit detected a hardware failure that does not prevent the tape unit from completing the present operation. See the 3490 Tape Unit service information to determine the failing item.	DHK0002
9302	I/O processor Licensed Internal Code error If the system is operational, take a dump of the I/O processor data. For more information, see the <i>AS/400 Service Functions</i> information or ask your next level of support for assistance.	FI00130
9310	Licensed Internal Code for the tape unit is not correct	FI00851 FI00130
9320	Tape device Licensed Internal Code failure Do the following: <ol style="list-style-type: none"> 1. Take a dump of the tape device Licensed Internal Code (see the 3490 Tape Drive service information). 2. Power off the tape unit. Then power on the tape unit to resume operation. 	FI00851

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9350	Tape unit detected a read or write error on tape medium A permanent read or write error occurred, and the tape unit determined that the tape cartridge is defective. Exchange the tape cartridge.	MHKTMED UHKCLN FI00851
9351	I/O processor Licensed Internal Code error If the system is operational, take a dump of the I/O processor data. For more information, see the <i>AS/400 Service Functions</i> information or ask your next level of support for assistance.	FI00130
9355	The data format is incorrect; the tape cannot be read The tape device does not give support to the data format on the tape cartridge. Re-initialize the tape cartridge or use a different tape cartridge.	MHKTMED UHKCLN FI00851
9500	I/O processor Licensed Internal Code error If the system is operational, take a dump of the I/O processor data. For more information, see the <i>AS/400 Service Functions</i> information or ask your next level of support for assistance.	FI00130
96xx	Tape unit failure Use online problem analysis and the 3490 Tape Unit service information to continue analyzing the problem.	
9800 to 9803	I/O processor successfully recovered from temporary error No action required. This reference code is logged for information only.	
9810	Problem analysis has determined a part should be replaced. This reference code is used for ending Online Problem Analysis with a list of failing items. (Information Only)	
9899	Problem analysis completed, the problem has been corrected. This reference code is used for ending Online Problem Analysis when no problem was found or the problem was corrected.	UHKFIXD
9900	Licensed Internal Code for tape unit was not upgraded The I/O processor loading of Licensed Internal Code (LIC) to the programmable tape unit was not completed. The tape unit will continue to operate with the previous LIC. You may do either of the following: <ul style="list-style-type: none"> • Wait for next IPL when the system will attempt to load the LIC for the tape unit again. • Perform "TU-PIP4" on page 505 to reset the IOP and the tape unit. When the IOP is reset, if the device has the wrong level of LIC, the IOP will attempt to load the new LIC. 	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
Axxx, Bxxx, Cxxx, Dxxx, Exxx, F00x	Tape unit failure Use online problem analysis and the 3490 Tape Unit service information to continue analyzing the problem.	
FFD5	Device error reported; tape I/O processor Verify the following: 1. That power is switched on in the 3490 Tape Unit Rack: <ul style="list-style-type: none"> • Set the 3490 Rack Unit Emergency Power Off switch to the On position. • Ensure that the 3490 Rack Enable/Off switch is set to the Enable position. • Press the 3490 Rack Power On button. 2. Verify the following on 3490 Tape Unit: <ul style="list-style-type: none"> • The Channel Enable/Disable switches are set to the Enable position. • The Normal/Test switch is set to the Normal position. • The CU Online/Offline switch is set to the Online position. • The Drive Address Online/Offline switches are set to the Online position. • The Drive DC Power switches are set to the On position. <p>If you are attempting to perform an IPL from the device that had the error, verify that the drive control unit address switch has an address of hexadecimal 7 and the drive unit address switch has an address of 0.</p> <p>Use the 3490 Tape Unit service information to continue analyzing the problem.</p>	UHK0003 DHK0002
FFF6	Volume statistics; logged only No action required. This reference code is logged for information only.	

Tape Unit Failing Items

Notes:

1. To determine the failing items, go to “Failing Items” on page 539.
2. To determine the associated part numbers, go to “Type, Model, and Part Number List” on page 750.
3. To determine the parts associated with symbolic FRUs, such as “ANYBUS”, or “DEVTERM”, go to “Symbolic FRUs” on page 559.

Failing Item	Description	Document Description
05H3834	Interposer	Magnetic tape subsystem service information
61G8324	Terminating plug	Magnetic tape subsystem service information

Failing Item	Description	Document Description
DHK0002	I/O device	Use the sense bytes and 3490 MI to find the failing items
EXTSCSI	External signal cable	Problem Analysis; Symbolic FRU Isolation
MHK0001	Tape	Magnetic tape subsystem operator's information
MHKTMED	Defective removable media	Magnetic tape subsystem operator's information
UHK0003	I/O device not communicating	Magnetic tape subsystem operator's information
UHKCLN	Tape unit needs cleaning	Magnetic tape subsystem operator's information
UHKCNFG	Tape configuration detected by I/O processor; not valid	Installation

(3494) Tape Library Reference Codes

A tape or a tape library failure occurred.

Note: For tape device and IOP reset procedures, see "TU-PIP4" on page 505.

1. Is the operating system available and can you enter commands from the command line?

Yes No

↓ Go to step 3 of this procedure.

2. Is OS/400 available on the system (see "Determining the Dominant Operating System" in the *AS/400 Service Functions*)?

No Yes

↓ Use the online problem analysis procedures to isolate the problem. Use the WRKPRB (Work with Problem) command to determine if a recent problem was entered in the problem log, or use the VFYTAP (Verify Tape) command to run verification tests.

3. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
2301	Library device failure Library attachment facility equipment check. Use the 3494 Tape Library Dataserver Maintenance Information and follow the procedures for analyzing a "LIBRARY PROBLEM - NO ERROR MESSAGE."	3494

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
2303	Library device failure Device control unit and library manager Licensed Internal Code are incompatible. Use the 3494 Tape Library Dataserver Maintenance Information and follow the procedures for analyzing a "LIBRARY PROBLEM - NO ERROR MESSAGE."	DHALIBC DHADEV
2306 to 2307	Library device failure Library vision failure. Use the 3494 Tape Library Dataserver Maintenance Information and follow the procedures for analyzing a "LIBRARY PROBLEM - NO ERROR MESSAGE."	3494
2308	Library device failure Library manager equipment check. Use the 3494 Tape Library Dataserver Maintenance Information and follow the procedures for analyzing a "LIBRARY MANAGER HARDWARE PROBLEM"	3494
2309	Library device failure Library equipment check. Use the 3494 Tape Library Dataserver Maintenance Information and follow the procedures for analyzing a "LIBRARY PROBLEM - NO ERROR MESSAGE."	3494
2310 to 2311	Library device requires operator intervention Put the library into pause mode and perform the intervention indicated on the library manager console.	
2319	Tape unit failure Use the tape unit service information to analyze the failure.	FI00851
2321	Library enclosure environmental alert was detected. Use the 3494 Tape Library Dataserver Maintenance Information and follow the procedures for analyzing a "LIBRARY PROBLEM - NO ERROR MESSAGE."	3494

Tape Library Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
3494	Library device	IBM 3494 Maintenance Information, SA37-0270
DHADEV	3490 Control Unit Licensed Internal Code	Refer to I/O device service information

Failing Item	Description	Document Description
DHALIBC	3494 Library Manager Licensed Internal Code	IBM 3494 Maintenance Information, SA37-0270

(3570) Tape Unit Reference Codes

A tape or a 3570 Tape Unit failure occurred.

Note: For tape device and IOP reset procedures, see "TU-PIP4" on page 505.

1. Is the operating system available and can you enter commands from the command line?

Yes No

↓ Go to step 3 of this procedure.

2. Is OS/400 available on the system (see "Determining the Dominant Operating System" in the *AS/400 Service Functions*)?

No Yes

↓ Use the online problem analysis procedures to isolate the problem. Use the WRKPRB (Work with Problem) command to determine if a recent problem was entered in the problem log, or use the VFYTAP (Verify Tape) command to run verification tests.

3. Verify that the 3570 is powered on.
4. Ensure that the 3570 SCSI address is set to 0.
5. Load the first tape.
6. Start a type D IPL from the system unit control panel.
7. Does the IPL complete successfully?

No Yes

↓ The problem has been corrected.

This ends the procedure.

8. Obtain another copy of the tape. Repeat steps 6 and 7 using the new tape. If this does not correct the problem, continue with step 10.
9. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
10. If the amber light on the 3570 indicator panel is on continuously, see the "Start" section of the 3570 service information.
11. Look at the Data display for word 3:
 - The 4 rightmost characters are the direct select address.
12. Look at the Data display for word 4:
 - The second character is the 3570 control unit address.
 - The fourth character is the 3570 drive address that has the error.
13. Find the unit reference code in the following table.
14. See the "Start" section of the 3570 service information.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.

3. If the failing item is a symbolic FRU, go to “Symbolic FRUs” on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9020	I/O processor detected a SCSI bus configuration error Before exchanging any parts, verify that the following conditions are not present: <ul style="list-style-type: none"> • Tape and DASD devices attached to an I/O processor that does not support tape and DASD devices at the same time. • A device type or model that is not given support. 	UHZCNFG DHZDEV FI00130
9100	Interface error detected by I/O processor or by tape unit Before exchanging any parts, do the following: <ol style="list-style-type: none"> 1. Ensure that an interposer is connected between the I/O processor and the SCSI cable. 2. Ensure that the SCSI cable between the interposer and the device is seated correctly, and that there are no bent or damaged pins on the SCSI cable. 3. Ensure that a terminating plug is attached to the device end of the SCSI cable. 	DHZDEV FI00131 05H3834 EXTSCSI 61G8324
9200	I/O processor addressed the tape unit; no response Before exchanging any parts, do the following: <ol style="list-style-type: none"> 1. Ensure that the device is powered on. 2. Ensure that an interposer is connected between the I/O processor and the SCSI cable. 3. Ensure that the SCSI cable between the interposer and the device is seated correctly, and that there are no bent or damaged pins on the SCSI cable. 4. Ensure that a terminating plug is attached to the device end of the SCSI cable. 	DHZDEV FI00131 05H3834 EXTSCSI 61G8324
9201	Tape unit command timeout Before exchanging any parts, do the following: <ol style="list-style-type: none"> 1. Ensure that the device is powered on. 2. Ensure that an interposer is connected between the I/O processor and the SCSI cable. 3. Ensure that the SCSI cable between the interposer and the device is seated correctly, and that there are no bent or damaged pins on the SCSI cable. 4. Ensure that a terminating plug is attached to the device end of the SCSI cable. 	DHZDEV FI00131 05H3834 EXTSCSI 61G8324
9202	Tape unit failed after Licensed Internal Code was loaded Before exchanging any parts, do the following: <ol style="list-style-type: none"> 1. Ensure that the device is powered on. 2. Ensure that an interposer is connected between the I/O processor and the SCSI cable. 3. Ensure that the SCSI cable between the interposer and the device is seated correctly, and that there are no bent or damaged pins on the SCSI cable. 4. Ensure that a terminating plug is attached to the device end of the SCSI cable. 	DHZDEV FI00131 05H3834 EXTSCSI 61G8324

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9210	Illegal or unsupported tape unit response	DHZDEV FI00131 FI00130
9300	Tape unit failure	DHZDEV
9301	Tape device failure, redundancy lost The tape unit detected a hardware failure that does not prevent the tape unit from completing the current operation. Refer to the 3570 Tape Unit service information to determine the failing item.	DHZDEV
9302	I/O processor Licensed Internal Code error If the system is operational, take a dump of the I/O processor data. For more information, see the <i>AS/400 Service Functions</i> information or ask your next level of support for assistance.	FI00130
9310	Licensed Internal Code for the tape unit is not correct	DHZDEV FI00130
9320	Tape device Licensed Internal Code failure Perform the following: 1. Take a dump of the tape unit Licensed Internal Code (see the 3570 Tape Unit service information). 2. Power off the tape unit. Then power on the tape unit to resume operation. 3. Ask your next level of support for assistance.	FI00130 DHZDEV
9350	Tape unit detected a read or write error on tape medium A permanent read or write error occurred, and the tape unit determined that the tape cartridge is defective. Exchange the tape cartridge.	MHZTMED UHZCLN DHZDEV
9351	Tape with excessive error rate was mounted in tape device. The tape unit detected that the mounted tape cartridge has a history of excessive read and write errors. It is recommended that you exchange the tape cartridge.	MHZTMED UHZCLN DHZDEV
9355	The data format is incorrect; the tape cannot be read The tape unit does not give support to the data format on the tape cartridge. Use a different tape cartridge.	UHZUSER MHZTMED UHZCLN DHZDEV
9500	I/O processor Licensed Internal Code error If the system is operational, take a dump of the I/O processor data. For more information, see the <i>AS/400 Service Functions</i> information or ask your next level of support for assistance.	FI00130
9800 to 9803	I/O processor successfully recovered from temporary error No action required. This reference code is logged for information only.	
9810	Problem analysis has determined a part should be replaced. This reference code is used for ending Online Problem Analysis with a list of failing items. (Information Only)	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9899	Problem analysis completed, the problem has been corrected. This reference code is used for ending Online Problem Analysis when no problem was found or the problem was corrected.	UHZFIXD
9900	Licensed Internal Code for tape unit was not upgraded The I/O processor loading of Licensed Internal Code (LIC) to the programmable tape unit was not completed. The tape unit will continue to operate with the previous LIC. You may do either of the following: <ul style="list-style-type: none"> • Wait for next IPL when the system will attempt to load the LIC for the tape drive again. • Perform "TU-PIP4" on page 505 to reset the IOP and the tape unit. When the IOP is reset, if the device has the wrong level of LIC, the IOP will attempt to load the new LIC. 	UHZUSER
FFF6	Tape volume statistics logged (no action required)	

Tape Unit Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
05H3834	Interposer	IBM 3570 Tape Drive Service Guide
61G8324	Terminating plug	IBM 3570 Tape Drive Service Guide
DHZDEV	Tape unit failure	IBM 3570 Tape Drive Service Guide
EXTSCSI	External signal cable	Problem Analysis; Symbolic FRU Isolation
MHZTMED	Defective removable media	Magnetic tape subsystem service information
UHZCLN	Tape unit needs cleaning	Magnetic tape subsystem operator's information
UHZCNFG	Tape configuration detected by I/O processor; not valid	Installation
UHZUSER	Operator action required	System operation information

(3590) Tape Unit Reference Codes

A tape or a 3590 Tape Unit failure occurred.

Note: For tape device and IOP reset procedures, see "TU-PIP4" on page 505.

1. Is the operating system available and can you enter commands from the command line?

Yes **No**

↓ Go to step 3 of this procedure.

2. Is OS/400 available on the system (see "Determining the Dominant Operating System" in the *AS/400 Service Functions*)?

No Yes

↓ Use the online problem analysis procedures to isolate the problem. Use the WRKPRB (Work with Problem) command to determine if a recent problem was entered in the problem log, or use the VFYTAP (Verify Tape) command to run verification tests.

3. Verify that the 3590 is powered on.
4. Ensure that the 3590 SCSI address is set to 0.
5. Verify that the 3590 Online/Offline switches are set to the Online position.
6. Load the first tape.
7. Start a type D IPL from the system unit control panel.
8. Does the IPL complete successfully?

No Yes

↓ The problem has been corrected.

This ends the procedure.

9. Obtain another copy of the tape. Repeat steps 6 and 7 using the new tape. If this does not correct the problem, continue with step 10.
10. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
11. If the 3590 indicator panel shows a FRU identifier (FID) code, see the "Start" section of the 3590 service information.
12. Look at the Data display for word 3:
 - The 4 rightmost characters are the direct select address.
13. Look at the Data display for word 4:
 - The second character is the 3590 control unit address.
 - The fourth character is the 3590 drive address that has the error.
14. Find the unit reference code in the following table.
15. See the "Start" section of the 3590 service information.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9020	<p>I/O processor detected a SCSI bus configuration error</p> <p>Before exchanging any parts, verify that the following conditions are <i>not</i> present:</p> <ul style="list-style-type: none"> • Tape and DASD devices attached to an I/O processor that does not support tape and DASD devices at the same time. • A device type or model that is not given support 	UHQCNFG FI00851 FI00130

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9100	Interface error detected by I/O processor or by tape unit Before exchanging any parts, do the following: 1. Ensure that an interposer is connected between the I/O processor and the SCSI cable. 2. Ensure that the SCSI cable between the interposer and the device is seated correctly, and that there are no bent or damaged pins on the SCSI cable. 3. Ensure that a terminating plug is attached to the device end of the SCSI cable.	FI00851 FI00131 05H3834 EXTSCSI 61G8324
9200	I/O processor addressed the tape unit; no response Before exchanging any parts, do the following: 1. Ensure that the device is powered on. 2. Ensure that an interposer is connected between the I/O processor and the SCSI cable. 3. Ensure that the SCSI cable between the interposer and the device is seated correctly, and that there are no bent or damaged pins on the SCSI cable. 4. Ensure that a terminating plug is attached to the device end of the SCSI cable.	FI00851 FI00131 05H3834 EXTSCSI 61G8324
9201	Tape unit command timeout Before exchanging any parts, do the following: 1. Ensure that the device is powered on. 2. Ensure that an interposer is connected between the I/O processor and the SCSI cable. 3. Ensure that the SCSI cable between the interposer and the device is seated correctly, and that there are no bent or damaged pins on the SCSI cable. 4. Ensure that a terminating plug is attached to the device end of the SCSI cable.	FI00851 FI00131 05H3834 EXTSCSI 61G8324
9202	Tape unit failed after Licensed Internal Code was loaded Before exchanging any parts, do the following: 1. Ensure that the device is powered on. 2. Ensure that an interposer is connected between the I/O processor and the SCSI cable. 3. Ensure that the SCSI cable between the interposer and the device is seated correctly, and that there are no bent or damaged pins on the SCSI cable. 4. Ensure that a terminating plug is attached to the device end of the SCSI cable.	FI00851 FI00131 05H3834 EXTSCSI 61G8324
9210	Illegal or unsupported tape unit response	FI00851 FI00131 FI00130
9300	Tape unit failure	FI00851
9301	Tape device failure, redundancy lost The tape unit detected a hardware failure that does not prevent the tape unit from completing the present operation. See the 3590 Tape Unit service information to determine the failing item.	FI00851

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9302	I/O processor Licensed Internal Code error If the system is operational, take a dump of the I/O processor data. For more information, see the <i>AS/400 Service Functions</i> information or ask your next level of support for assistance.	FI00130
9310	Licensed Internal Code for the tape unit is not correct	FI00851 FI00130
9320	Tape device Licensed Internal Code failure Do the following: 1. Take a dump of the tape device Licensed Internal Code (see the 3590 Tape Unit service information). 2. Power off the tape unit. Then power on the tape unit to resume operation.	FI00130 FI00851
9350	Tape unit detected a read or write error on tape medium A permanent read or write error occurred, and the tape unit determined that the tape cartridge is defective. Exchange the tape cartridge.	MHQTMED UHQCLN FI00851
9351	Tape with excessive error rate was mounted in tape device. The tape unit detected that the installed tape cartridge has a history of excessive read and write errors. It is recommended that you exchange the tape cartridge.	MHQTMED UHQCLN FI00851
9355	The data format is incorrect; the tape cannot be read The tape device does not give support to the data format on the tape cartridge. Format the tape cartridge again or use a different tape cartridge. See the <i>3590 Tape Drive Operator's Guide</i> for instructions on formatting a tape cartridge.	MHQTMED UHQCLN FI00851
9500	I/O processor Licensed Internal Code error If the system is operational, take a dump of the I/O processor data. For more information, see the <i>AS/400 Service Functions</i> information or ask your next level of support for assistance.	FI00130
9800 to 9803	I/O processor successfully recovered from temporary error No action required. This reference code is logged for information only.	
9810	Problem analysis has determined a part should be replaced. This reference code is used for ending Online Problem Analysis with a list of failing items. (Information Only)	
9899	Problem analysis completed, the problem has been corrected. This reference code is used for ending Online Problem Analysis when no problem was found or the problem was corrected.	UHQFIXD

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9900	<p>Licensed Internal Code for tape unit was not upgraded</p> <p>The I/O processor loading of Licensed Internal Code (LIC) to the programmable tape unit was not completed.</p> <p>The tape unit will continue to operate with the previous LIC. You may do either of the following:</p> <ul style="list-style-type: none"> • Wait for next IPL when the system will attempt to load the LIC for the tape unit again. • Perform "TU-PIP4" on page 505 to reset the IOP and the tape unit. When the IOP is reset, if the device has the wrong level of LIC, the IOP will attempt to load the new LIC. 	
FFF6	Tape volume statistics logged (no action required)	

Tape Unit Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
05H3834	Interposer	IBM 3590 Tape Drive Service Guide
61G8324	Terminating plug	IBM 3590 Tape Drive Service Guide
EXTSCSI	External signal cable	Problem Analysis; Symbolic FRU Isolation
MHQTMED	Defective removable media	Magnetic tape subsystem service information
UHQCLN	Tape unit needs cleaning	Magnetic tape subsystem operator's information
UHQCNFG	Tape configuration detected by I/O processor; not valid	Installation

(3995) Optical Library Dataserver Reference Codes

A 3995 Optical Library Dataserver failure occurred.

Note:

- If the system is available, use online diagnostic tests when possible.
 - Search the problem log (WRKPRB) for a recent 3995 entry that may assist in analyzing the problem. The WRKPRB entry will provide a unit reference code. This reference code can be found in the *3995 Optical Library Dataserver Maintenance Information Manual* for the 3995 model installed on the system.
1. Verify that the 3995 is powered on.
 2. Verify that the interface cable connections are correct for each 3995.
 3. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
 4. Go to the *3995 Optical Library Dataserver Maintenance Information Manual* for the 3995 model installed on the system and find the unit reference code.

(6050) Twinaxial Workstation I/O Processor Reference Codes

The twinaxial workstation I/O processor detected a failure.

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Look at the characters of the Data display for word 3. These 8 characters are the direct select address of the workstation I/O processor card (BBBBBcbb). See "Expansion Tower Locations and Addresses" on page 687 and the system configuration list to find the failing part.
3. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0000	Device no response time-out; temporary error	FI00601 FI00602 FI00610
0001	<p>WS IOP detected error when transmitting data</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <p>1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314</p> <p>2. "INT-PIP14 Station Protectors" on page 320</p> <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	FI00602 FI00601 GX27777 GX28888 FI00610 22F0097 FI00615
0003	<p>WS IOP detected parity error from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <p>1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314</p> <p>2. "INT-PIP14 Station Protectors" on page 320</p> <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	FI00602 FI00601 GX27777 FI00610

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0004	<p>Device detected parity error from WS IOP</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	FI00602 FI00601 GX27777 FI00610
0005	<p>WS IOP detected error when transmitting data</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	FI00602 FI00601 GX28888 FI00610 FI00615 22F0097
0006	<p>WS IOP detected wrong data from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	FI00601 FI00602 GX28888 FI00610
0007	<p>WS IOP detected wrong address from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	FI00601 GX28888 GX27777 FI00610
0008	<p>WS IOP detected device power turned off, and then on</p>	GX2EEEE FI00601
0009	<p>WS IOP detected wrong device response to start command</p> <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	FI00601 FI00610
0020	<p>Device detected wrong command or device ID from WS IOP</p> <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	FI00601 AJLYD01 FI00610
0021	<p>Device detected not valid value from WS IOP</p> <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	FI00601 AJLYD01 FI00610

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0022	Device detected storage or data overrun Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 FI00610 AJLYD01
0023	Device detected null or attribute exception error Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 FI00610
0024	Device detected wrong start command from WS IOP Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 AJLYD01 FI00610
0025	WS IOP detected wrong exception response from device Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 FI00610
0026	WS IOP detected not valid pass-through command	GX29999 FI00610
0049	WS IOP detected wrong request or response from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0082	WS IOP detected wrong device type from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601
0090	WS IOP detected no status change from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0091	WS IOP detected busy time-out from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0100	Device no response time-out; temporary error Is the problem intermittent? No Yes ↓ Perform the following intermittent problem isolation procedures in the sequence listed: 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 Exchange the failing item.	FI00601 FI00602 FI00610
0101	WS IOP detected error when transmitting data Is the problem intermittent? No Yes ↓ Perform the following intermittent problem isolation procedures in the sequence listed: 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 Perform "TWSC-PIP1 (5077)" on page 525.	FI00602 FI00601 GX27777 GX28888 FI00610 FI00615

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0103	<p>WS IOP detected parity error from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	<p>FI00602 FI00601 GX27777 FI00610</p>
0104	<p>Device detected parity error from WS IOP</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	<p>FI00602 FI00601 GX27777 FI00610</p>
0105	<p>WS IOP detected error when transmitting data</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	<p>FI00602 GX28888 FI00601 FI00610 FI00615 22F0097</p>
0106	<p>WS IOP detected wrong data from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	<p>FI00601 FI00602 GX28888 FI00610</p>
0107	<p>WS IOP detected wrong address from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	<p>FI00601 GX28888 GX27777 FI00610</p>

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0108	WS IOP detected device power turned off, and then on	GX2EEEE FI00601
0109	WS IOP detected wrong device response to start command Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 FI00610
0111	WS IOP detected wrong keyboard scan code from display Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 AJLYD01 FI00610
0120	Device detected wrong command or device ID from WS IOP Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 AJLYD01 FI00610
0121	Device detected not valid value from WS IOP Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 AJLYD01 FI00610
0122	Device detected storage or data overrun Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 FI00610 AJLYD01
0123	Device detected null or attribute exception error Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 FI00610
0124	Device detected wrong start command from WS IOP Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 AJLYD01 FI00610
0125	WS IOP detected wrong exception response from device Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 FI00610
0126	WS IOP detected not valid pass-through command	GX29999 FI00610
0149	WS IOP detected wrong request or response from device Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 FI00610
0170	WS IOP detected error downloading printer definition table	AJDG301 FI00601
0171	WS IOP detected error downloading printer definition table	FI00601 AJLYD01
0172	WS IOP detected error downloading printer definition table	CX2PDT AJDG301 FI00601
0173	WS IOP detected error downloading printer definition table	CX2PDT FI00601
0174	WS IOP detected error unloading printer definition table	FI00601 AJLYD01
0175	WS IOP detected device configuration error	FI00601 AJLYD01
0176 to 0177	WS IOP detected error downloading LIC to device	GX2DMCC FI00601
0181	Wrong magnetic stripe reader response	FI00605 MX2FFFF FI00601 FI00610

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0182	WS IOP detected wrong device type from device Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601
0183	WS IOP detected wrong display size value Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601
0184	WS IOP detected wrong keyboard identification Verify that the correct keyboard is attached correctly to the workstation. If the correct keyboard is attached correctly to the workstation perform "TWSC-PIP1 (5077)" on page 525 .	FI00601
0189	Wrong magnetic stripe reader or light pen status	FI00601 FI00605 FI00607 FI00610
0190	WS IOP detected no status change from device Is the problem intermittent? No Yes ↓ Perform the following intermittent problem isolation procedures in the sequence listed: 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 FI00610 GX27777
0191	WS IOP detected busy time-out from device Perform "TWSC-PIP1 (5077)" on page 525 .	FI00601 FI00610
0200	Device no response time-out; temporary error	FI00604 FI00602 FI00610
0201	WS IOP detected error when transmitting data Is the problem intermittent? No Yes ↓ Perform the following intermittent problem isolation procedures in the sequence listed: 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 Perform "TWSC-PIP1 (5077)" on page 525 .	FI00602 FI00604 GX27777 GX28888 FI00610 22F0097 FI00615
0203	WS IOP detected parity error from device Is the problem intermittent? No Yes ↓ Perform the following intermittent problem isolation procedures in the sequence listed: 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 Perform "TWSC-PIP1 (5077)" on page 525 .	FI00602 FI00604 GX27777 FI00610

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0204	<p>Device detected parity error from WS IOP</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	FI00602 FI00604 GX27777 FI00610
0205	<p>WS IOP detected error when transmitting data</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	FI00602 GX27777 FI00604 FI00610 FI00615 22F0097
0206	<p>WS IOP detected wrong data from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	FI00604 FI00602 GX28888 FI00610
0207	<p>WS IOP detected wrong address from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	FI00604 GX28888 GX27777 FI00610
0208	<p>WS IOP detected device power turned off, and then on</p>	GX2EEEE FI00604
0209	<p>WS IOP detected wrong device response to start command</p>	FI00604 FI00610
0210	<p>Printer detected equipment error</p>	FI00604
0211	<p>Printer detected equipment error</p>	FI00604 AJLYD01 FI00610
0212	<p>Printer detected equipment error</p>	FI00604

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0220	Device detected wrong command or device ID from WS IOP	FI00604 AJLYD01 FI00610
0221	Device detected not valid value from WS IOP	FI00604 AJLYD01 FI00610
0222	Device detected storage or data overrun	FI00604 AJLYD01 FI00610
0223	WS IOP detected start command to printer was lost	FI00604 FI00602 FI00610
0224	Device detected wrong start command from WS IOP	FI00604 AJLYD01 FI00610
0225	WS IOP detected wrong exception response from device	FI00604 FI00610
0230 to 0239, 0240 to 0248	Printer detected equipment error	FI00604
0249	WS IOP detected wrong request or response from device	FI00604 FI00610
0258	Printer detected end of ribbon check	FI00604
0260 to 0269	Printer detected equipment error	AJDG301 GX2DMCC
0281, 0283 to 0289	Printer detected equipment error	FI00604
0290	WS IOP detected no status change from device	FI00604 FI00610
0291	WS IOP detected busy time-out from device	FI00604 FI00610
A000	<p>Too many devices active on the workstation IOP</p> <p>There are too many devices attached (powered on) to the workstation I/O processor that the console is attached to than are allowed on the workstation I/O processor.</p> <p>Switch off power (or remove) one or more of the devices (except for the console) that are attached to this workstation I/O processor. Perform an initial program load (IPL) from the control panel to correct the problem.</p> <p>Refer to the local workstation diagrams for the location of the workstations if necessary.</p>	GX2BBBB
B000	WS IOP fails to report part, model and serial number	FI00610
C000	WS IOP error not known	AJLYD01 FI00610

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
D000	<p>Work Station IOA start-up test error</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP7 Electromagnetic Interference (EMI)" on page 315 <p>Exchange the first workstation I/O processor card</p>	FI00610
D010	WS IOP storage failure corrected	FI00610
D011	WS IOP card storage failure	FI00610
D021	WS IOP detected errors on all cables	FI00602 FI00601 FI00610 FI00615 22F0097
D022	WS IOP parity errors detected on all cables	FI00602 FI00601 FI00610 FI00615 22F0097
D023	<p>WS IOP detected errors on some, but not all cables</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following intermittent problem isolation procedures in the sequence listed:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP7 Electromagnetic Interference (EMI)" on page 315 <p>Perform "TWSC-PIP1 (5077)" on page 525 .</p>	FI00602 FI00601 FI00610
E000	WS IOP or IOA error during working operation	AJLYD01 FI00610
F000	WS IOP or IOA operating system program error	AJLYD01
FFFF	<p>User-detected workstation problem</p> <p>Reference code FFFF is assigned by the ANZPRB (Analyze Problems) for user-detected errors. Run ANZPRB again if the problem still exists or look in the problem log (WRKPRB) for possible failing FRUs.</p>	UX2FF00

Twinaxial Workstation I/O Processor Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
22F0097	Work station attachment conversion cable	Repair Guide; removal and installation procedures
AJDG301	Licensed program	Service Functions; APAR or LICTR
AJLYD01	Work Station IOP or IOA system Licensed Internal Code	Service Functions; APAR or LICTR
CX2PDT	Printer definition table	
GX27777	Electrical interference	
GX28888	Other work station on port is failing	
GX29999	Error occurred with pass-through command	
GX2BBBB	Too many work stations are active on the workstation IOP	
GX2DMCC	Device Licensed Internal Code change	
GX2EEEE	Active device turned off	
MX2FFFF	Magnetic stripe	Refer to I/O device service information
UX2FF00	User believes there is a problem	

(6055) Workstation Adapter Reference Codes

A workstation adapter failure occurred.

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0101	WS IOP detected error when transmitting data	FI00601 GAG7777 FI00631 AJLAG01
0103	WS IOP detected parity error from device	FI00601 GAG7777 FI00631 AJLAG01
0104	Device detected parity error from WS IOP	FI00601 GAG7777 FI00631 AJLAG01
0105	WS IOP detected error when transmitting data	FI00601 GAG7777 FI00631 AJLAG01

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0106	WS IOP detected wrong data from device	FI00601 FI00631 GAG7777 AJLAG01
0107	WS IOP detected wrong address from device	FI00601 GAG7777 AJLAG01
0108	WS IOP detected device power turned off, and then on	GAGEEEE FI00601
0109	WS IOP detected wrong device response to start command	FI00601 AJLAG01
0111	WS IOP detected wrong keyboard scan code from display	FI00601 AJLAG01
0120	Device detected wrong command or device ID from WS IOP	FI00601 AJLAG01
0121	Device detected not valid value from WS IOP	FI00601 AJLAG01
0122	Device detected storage or data overrun	FI00601 AJLAG01
0123	Device detected null or attribute exception error	FI00601 AJLAG01
0124	Device detected wrong start command from WS IOP	FI00601 AJLAG01
0125	WS IOP detected wrong exception response from device	FI00601 AJLAG01
0126	WS IOP detected not valid pass-through command	GAG9999 AJLAG01
0149	WS IOP detected wrong request or response from device	FI00601 AJLAG01
0190	WS IOP detected no status change from device	FI00601 GAG7777 AJLAG01
0191	WS IOP detected busy time-out from device	FI00601 AJLAG01
0201	WS IOP detected error when transmitting data	FI00604 GAG7777 FI00631 AJLAG01
0203	WS IOP detected parity error from device	FI00604 GAG7777 FI00631 AJLAG01
0204	Device detected parity error from WS IOP	FI00604 GAG7777 FI00631 AJLAG01
0205	WS IOP detected error when transmitting data	FI00604 GAG7777 FI00631 AJLAG01

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0206	WS IOP detected wrong data from device	FI00604 FI00631 AJLAG01
0207	WS IOP detected wrong address from device	FI00604 GAG7777 AJLAG01
0208	WS IOP detected device power turned off, and then on	GAGEEEE FI00604
0209	WS IOP detected wrong device response to start command	FI00604 AJLAG01
0210	Printer detected equipment error	FI00604
0211	Printer detected equipment error	FI00604 AJLAG01
0212	Printer detected equipment error	FI00604
0220	Device detected wrong command or device ID from WS IOP	FI00604 AJLAG01
0221	Device detected not valid value from WS IOP	FI00604 AJLAG01
0222	Device detected storage or data overrun	FI00604 AJLAG01
0223	WS IOP detected start command to printer was lost	FI00604 FI00631 AJLAG01
0224	Device detected wrong start command from WS IOP	FI00604 AJLAG01
0225	WS IOP detected wrong exception response from device	FI00604 AJLAG01
0230 to 0239, 0240 to 0248	Printer detected equipment error	FI00604
0249	WS IOP detected wrong request or response from device	FI00604 AJLAG01
0281, 0283 to 0289	Printer detected equipment error	FI00604
0290	WS IOP detected no status change from device	FI00604 AJLAG01
0291	WS IOP detected busy time-out from device	FI00604 AJLAG01
A000	Too many devices active on the workstation IOP	GAGBBBB
C000, D000	WS IOP error not known	AJLAG01
F000	WS IOP or IOA operating system program error	AJLAG01
F003	WS IOA buffer utilization threshold exceeded temporarily	AJLAG01
FFFF	User believes there is a problem Reference code FFFF is assigned by the ANZPRB (Analyze Problems) for user-detected errors. Run ANZPRB again if the problem still exists or look in the problem log (WRKPRB) for possible failing FRUs.	UAGFF00

Workstation Adapter Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
AJLAG01	Work Station IOP or IOA system Licensed Internal Code	Service Functions; APAR or LICTR
GAG7777	Electrical interference	
GAG9999	Error occurred with pass-through command	
GAGBBBB	Too many work stations are active on the workstation IOP	
GAGEEEE	Active device turned off	
UAGFF00	User believes there is a problem	

(6056) Workstation Adapter Reference Codes

A workstation adapter failure occurred.

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0101	WS IOP detected error when transmitting data	FI00601 GAG7777 FI00631 AJLAG01
0103	WS IOP detected parity error from device	FI00601 GAG7777 FI00631 AJLAG01
0104	Device detected parity error from WS IOP	FI00601 GAG7777 FI00631 AJLAG01
0105	WS IOP detected error when transmitting data	FI00601 GAG7777 FI00631 AJLAG01

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0106	WS IOP detected wrong data from device	FI00601 FI00631 GAG7777 AJLAG01
0107	WS IOP detected wrong address from device	FI00601 GAG7777 AJLAG01
0108	WS IOP detected device power turned off, and then on	GAGEEEE FI00601
0109	WS IOP detected wrong device response to start command	FI00601 AJLAG01
0111	WS IOP detected wrong keyboard scan code from display	FI00601 AJLAG01
0120	Device detected wrong command or device ID from WS IOP	FI00601 AJLAG01
0121	Device detected not valid value from WS IOP	FI00601 AJLAG01
0122	Device detected storage or data overrun	FI00601 AJLAG01
0123	Device detected null or attribute exception error	FI00601 AJLAG01
0124	Device detected wrong start command from WS IOP	FI00601 AJLAG01
0125	WS IOP detected wrong exception response from device	FI00601 AJLAG01
0126	WS IOP detected not valid pass-through command	GAG9999 AJLAG01
0149	WS IOP detected wrong request or response from device	FI00601 AJLAG01
0190	WS IOP detected no status change from device	FI00601 GAG7777 AJLAG01
0191	WS IOP detected busy time-out from device	FI00601 AJLAG01
0201	WS IOP detected error when transmitting data	FI00604 GAG7777 FI00631 AJLAG01
0203	WS IOP detected parity error from device	FI00604 GAG7777 FI00631 AJLAG01
0204	Device detected parity error from WS IOP	FI00604 GAG7777 FI00631 AJLAG01
0205	WS IOP detected error when transmitting data	FI00604 GAG7777 FI00631 AJLAG01

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0206	WS IOP detected wrong data from device	FI00604 FI00631 AJLAG01
0207	WS IOP detected wrong address from device	FI00604 GAG7777 AJLAG01
0208	WS IOP detected device power turned off, and then on	GAGEEEE FI00604
0209	WS IOP detected wrong device response to start command	FI00604 AJLAG01
0210	Printer detected equipment error	FI00604
0211	Printer detected equipment error	FI00604 AJLAG01
0212	Printer detected equipment error	FI00604
0220	Device detected wrong command or device ID from WS IOP	FI00604 AJLAG01
0221	Device detected not valid value from WS IOP	FI00604 AJLAG01
0222	Device detected storage or data overrun	FI00604 AJLAG01
0223	WS IOP detected start command to printer was lost	FI00604 FI00631 AJLAG01
0224	Device detected wrong start command from WS IOP	FI00604 AJLAG01
0225	WS IOP detected wrong exception response from device	FI00604 AJLAG01
0230 to 0239, 0240 to 0248	Printer detected equipment error	FI00604
0249	WS IOP detected wrong request or response from device	FI00604 AJLAG01
0281, 0283 to 0289	Printer detected equipment error	FI00604
0290	WS IOP detected no status change from device	FI00604 AJLAG01
0291	WS IOP detected busy time-out from device	FI00604 AJLAG01
A000	Too many devices active on the workstation IOP	GAGBBBB
C000, D000	WS IOP error not known	AJLAG01
F000	WS IOP or IOA operating system program error	AJLAG01
F003	WS IOA buffer utilization threshold exceeded temporarily	AJLAG01
FFFF	User believes there is a problem Reference code FFFF is assigned by the ANZPRB (Analyze Problems) for user-detected errors. Run ANZPRB again if the problem still exists or look in the problem log (WRKPRB) for possible failing FRUs.	UAGFF00

Workstation Adapter Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
AJLAG01	Work Station IOP or IOA system Licensed Internal Code	Service Functions; APAR or LICTR
GAG7777	Electrical interference	
GAG9999	Error occurred with pass-through command	
GAGBBBB	Too many work stations are active on the workstation IOP	
GAGEEEE	Active device turned off	
UAGFF00	User believes there is a problem	

(6112) Magnetic Storage I/O Processor Reference Codes

The magnetic storage I/O processor detected a failure.

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1000	Storage device IOP card failed Perform "MSIOP Parts Location" on page 391.	6112
1001	Storage device IOP communications to system failed Perform "MSIOP-PIP1" on page 369.	6112 AJER101 FI00580
1010, 1020, 1030, 1050	Storage device IOP statistics have been logged No action required. This reference code is logged for information only.	
2000	Open circuit was detected on device cable Perform "MSIOP-PIP2" on page 370.	FI00580 FI00500 6112 6495246
2010	Shorted circuit was detected on device cable Perform "MSIOP-PIP2" on page 370.	FI00580 FI00500 6112 6495246

6112

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
2020	Storage device IOP card failed Perform "MSIOP Parts Location" on page 391.	6112
2030	Write and Read test to the device failed Perform "MSIOP-PIP3" on page 371.	FI00581
2040	Storage device IOP detected error on device cable Perform "MSIOP-PIP4" on page 372.	FI00580 6112
2050	Storage device IOP detected error on device cable Perform "MSIOP-PIP5" on page 374.	FI00580 FI00500 6112 6495246
3000	Storage device IOP card failed Perform "MSIOP-PIP11" on page 379.	6112
3001	Storage device IOP card failed Perform "MSIOP Parts Location" on page 391.	6112 AJER101
3002	Storage device IOP communications to device failed The MSIOP cannot select the device because the device is not responding. Is the problem intermittent? No Yes ↓ Perform the following procedures: 1. "INT-PIP7 Electromagnetic Interference (EMI)" on page 315 2. "MSIOP-PIP12" on page 380 Perform "MSIOP-PIP1" on page 369.	FI00581 6112
3003	Storage device IOP card failed Perform "MSIOP-PIP11" on page 379.	6112
3004	Storage device IOP communications to device failed The MSIOP detected an error during a packet transfer from the device controller. Perform "MSIOP-PIP8" on page 377.	FI00581 6112
3005	Storage device IOP communications to device failed The MSIOP licensed internal code detected a device controller status that was not valid. Perform "MSIOP-PIP1" on page 369.	FI00581 6112
3006	Storage device IOP communications to system failed The system attempted to send the MSIOP a bus command that was not valid. Perform "MSIOP Parts Location" on page 391.	6112 AJER101

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3007	Storage device IOP communications to system failed The system detected a failure while the MSIOP was attempting to communicate on the system bus. Perform "MSIOP Parts Location" on page 391.	6112 AJER101
300C	Storage device IOP communications to device failed The device controller reported that an interface protocol error occurred while communicating with the MSIOP. Perform "MSIOP-PIP1" on page 369.	FI00581 6112
300D	Storage device IOP communications to device failed Perform "MSIOP-PIP10" on page 378.	FI00581 6112
300E	Storage device IOP communications to device failed The device controller detected a protocol error while communicating with the MSIOP. Perform "MSIOP-PIP10" on page 378.	FI00581 6112
3010	Storage device IOP detected error in device response Perform "MSIOP-PIP6" on page 375.	FI00581 AJER101
3011 to 3012, 3014 to 3015	Storage device IOP card failed Perform "MSIOP Parts Location" on page 391.	6112
3100	Storage device IOP communications to device failed The MSIOP detected a parity error on the device interface. Retry attempts failed. Perform "MSIOP-PIP1" on page 369.	FI00581 FI00500 6112 6495246
3101	Storage device IOP communications to device failed The MSIOP detected a sequence error on the device interface. Retry attempts failed. Perform "MSIOP-PIP1" on page 369.	FI00581 6112 6495246 FI00500
3104	Storage device IOP communications to device failed The MSIOP detected a ending sequence error on the device interface. Retry attempts failed. Perform "MSIOP-PIP1" on page 369.	FI00581 6112 AJER101
3106	Storage device IOP communications to device failed The MSIOP detected a synchronization error on the device interface. Retry attempts failed. Perform "MSIOP-PIP1" on page 369.	FI00581 6112 FI00500 6495246
3107	Storage device IOP card failed Perform "MSIOP Parts Location" on page 391.	6112
3108	Storage device IOP statistics have been logged No action required. This reference code is logged for information only.	

6112

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3109	Storage device IOP communications to device failed Perform "MSIOP-PIP1" on page 369.	FI00581 6112 6495246 FI00500
3110	Attached storage device stopped working Is the problem intermittent? No Yes ↓ Perform the following procedures: 1. "INT-PIP18 PTFs Not Installed" on page 320 2. "INT-PIP7 Electromagnetic Interference (EMI)" on page 315 3. "MSIOP-PIP12" on page 380 Perform "MSIOP-PIP7" on page 376.	FI00581
3200	Error occurred in device starting sequence Perform "MSIOP-PIP9" on page 378.	FI00581 AJER101
3300	Data Block was assigned to a new location on a disk unit No action required. This reference code is logged for information only.	
4000	Storage device IOP Licensed Internal Code failed Is the problem intermittent? No Yes ↓ Perform the following procedures: 1. "INT-PIP18 PTFs Not Installed" on page 320 2. "INT-PIP7 Electromagnetic Interference (EMI)" on page 315 3. "INT-PIP16 Licensed Internal Code" on page 320 4. "MSIOP-PIP12" on page 380 Perform "MSIOP-PIP13" on page 382.	AJER101 6112 FI00580
4001	IOP Licensed Internal Code failed and recovered No action required. This reference code is logged for information only.	
4002	Storage device IOP Licensed Internal Code failed	AJER101
6000	Storage device IOP statistics have been logged No action required. This reference code is logged for information only.	
6001	Device format not set to 520 byte blocks Perform "MSIOP-PIP6" on page 375.	FI00581 AJER101
6002	Storage device IOP Licensed Internal Code failed	AJER101
6003 to 6004	Storage device IOP or Licensed Internal Code failed	AJDG301 AJER101
6005	Configuration not valid; too many devices attached Perform "MSIOP-PIP6" on page 375.	FI00580 AJER101
6006	Device is down level or not supported Perform "MSIOP-PIP6" on page 375.	FI00581 AJER101

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6007	<p>Command time-out occurred; reset sent to device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures:</p> <ol style="list-style-type: none"> 1. "INT-PIP18 PTFs Not Installed" on page 320 2. "INT-PIP7 Electromagnetic Interference (EMI)" on page 315 3. "MSIOP-PIP12" on page 380 <p>Perform "MSIOP-PIP12" on page 380.</p>	FI00581 AJER101 6112 6495246 FI00500 AJDG301
6008	<p>Storage device IOP statistics have been logged</p> <p>No action required. This reference code is logged for information only.</p>	

Magnetic Storage I/O Processor Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
6112	Magnetic storage device IOP card	Repair and Parts; removal and installation procedures
6495246	Terminating plug	Repair and Parts; parts listing
AJDG301	Licensed Internal Code	Service Functions; APAR or LICTR
AJER101	Magnetic storage device IOP Licensed Internal Code	Service Functions; APAR or LICTR

(6140) Twinaxial Workstation I/O Processor Reference Codes

The twinaxial workstation I/O processor detected a failure.

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Look at the characters of the Data display for word 3. These 8 characters are the direct select address of the workstation I/O processor card (BBBBcbb). See "Expansion Tower Locations and Addresses" on page 687 and the system configuration list to find the failing part.
3. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0000	Device no response time-out; temporary error	FI00601 FI00602 FI00610
0001	<p>WS IOP detected error when transmitting data</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <p>1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314.</p> <p>2. “INT-PIP14 Station Protectors” on page 320.</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	FI00602 FI00601 GLM7777 GLM8888 FI00610 FI00615 22F0097
0003	<p>WS IOP detected parity error from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <p>1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314.</p> <p>2. “INT-PIP14 Station Protectors” on page 320.</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	FI00602 FI00601 GLM7777 FI00610
0004	<p>Device detected parity error from WS IOP</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <p>1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314.</p> <p>2. “INT-PIP14 Station Protectors” on page 320.</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	FI00602 FI00601 GLM7777 FI00610
0005	<p>WS IOP detected error when transmitting data</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <p>1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314.</p> <p>2. “INT-PIP14 Station Protectors” on page 320.</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	FI00602 FI00601 GLM8888 FI00610 FI00615 22F0097

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0006	<p>WS IOP detected wrong data from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313 :</p> <p>1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314.</p> <p>2. INT-PIP14 Station Protectors</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601</p> <p>FI00602</p> <p>GLM8888</p> <p>FI00610</p>
0007	<p>WS IOP detected wrong address from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <p>1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314.</p> <p>2. “INT-PIP14 Station Protectors” on page 320.</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601</p> <p>GLM8888</p> <p>GLM7777</p> <p>FI00610</p>
0008	<p>WS IOP detected device power turned off, and then on</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>GLMEEEE</p> <p>FI00601</p>
0009	<p>WS IOP detected wrong device response to start command</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601</p> <p>FI00610</p>
0020	<p>Device detected wrong command or device ID from WS IOP</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601</p> <p>AJLYD01</p> <p>FI00610</p>
0021	<p>Device detected not valid value from WS IOP</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601</p> <p>AJLYD01</p> <p>FI00610</p>
0022	<p>Device detected storage or data overrun</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601</p> <p>AJLYD01</p> <p>FI00610</p>
0023	<p>Device detected null or attribute exception error</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601</p> <p>FI00610</p>
0024	<p>Device detected wrong start command from WS IOP</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601</p> <p>AJLYD01</p> <p>FI00610</p>
0025	<p>WS IOP detected wrong exception response from device</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601</p> <p>FI00610</p>
0026	<p>WS IOP detected not valid pass-through command</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>GLM9999</p> <p>FI00610</p>
0049	<p>WS IOP detected wrong request or response from device</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601</p> <p>FI00610</p>

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0082	WS IOP detected wrong device type from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601
0090	WS IOP detected no status change from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0091	WS IOP detected busy time-out from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0100	Device no response time-out; temporary error	FI00601 FI00602 FI00610
0101	WS IOP detected error when transmitting data Is the problem intermittent? No Yes ↓ Perform the following procedures in "Intermittent Problem Isolation Procedures" on page 313: 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314. 2. "INT-PIP14 Station Protectors" on page 320. Perform "TWSC-PIP1 (5077)" on page 525.	FI00602 FI00601 GLM7777 GLM8888 FI00610 FI00615
0103	WS IOP detected parity error from device Is the problem intermittent? No Yes ↓ Perform the following procedures in "Intermittent Problem Isolation Procedures" on page 313: 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314. 2. INT-PIP14 Station Protectors Perform "TWSC-PIP1 (5077)" on page 525.	FI00602 FI00601 GLM7777 FI00610
0104	Device detected parity error from WS IOP Is the problem intermittent? No Yes ↓ Perform the following procedures in "Intermittent Problem Isolation Procedures" on page 313: 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314. 2. INT-PIP14 Station Protectors Perform "TWSC-PIP1 (5077)" on page 525.	FI00602 FI00601 GLM7777 FI00610

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0105	<p>WS IOP detected error when transmitting data</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <ol style="list-style-type: none"> 1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314. 2. INT-PIP14 Station Protectors <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00602 FI00601 GLM8888 FI00610 FI00615 22F0097</p>
0106	<p>WS IOP detected wrong data from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <ol style="list-style-type: none"> 1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314. 2. INT-PIP14 Station Protectors <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601 FI00602 GLM8888 FI00610</p>
0107	<p>WS IOP detected wrong address from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <ol style="list-style-type: none"> 1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314. 2. INT-PIP14 Station Protectors <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601 GLM8888 GLM7777 FI00610</p>
0108	<p>WS IOP detected device power turned off, and then on</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>GLMEEEE FI00601</p>
0109	<p>WS IOP detected wrong device response to start command</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601 FI00610</p>
0111	<p>WS IOP detected wrong keyboard scan code from display</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601 AJLYD01 FI00610</p>
0120	<p>Device detected wrong command or device ID from WS IOP</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601 AJLYD01 FI00610</p>
0121	<p>Device detected not valid value from WS IOP</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601 AJLYD01 FI00610</p>
0122	<p>Device detected storage or data overrun</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601 AJLYD01 FI00610</p>
0123	<p>Device detected null or attribute exception error</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601 FI00610</p>

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0124	Device detected wrong start command from WS IOP Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 AJLYD01 FI00610
0125	WS IOP detected wrong exception response from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0126	WS IOP detected not valid pass-through command Perform "TWSC-PIP1 (5077)" on page 525.	GLM9999 FI00610
0149	WS IOP detected wrong request or response from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0170	WS IOP detected error downloading printer definition table	AJDG301 FI00601
0171	WS IOP detected error downloading printer definition table	FI00601 AJLYD01
0172	WS IOP detected error downloading printer definition table	CLMPDT AJDG301 FI00601
0173	WS IOP detected error downloading printer definition table	CLMPDT FI00601
0174	WS IOP detected error unloading printer definition table	FI00601 AJLYD01
0175	WS IOP detected device configuration error	FI00601 AJLYD01
0176 to 0177	WS IOP detected error downloading LIC to device	GLMDMCC FI00601
0181	Wrong magnetic stripe reader response Perform "TWSC-PIP1 (5077)" on page 525.	FI00605 MLMFFFF FI00601 FI00610
0182	WS IOP detected wrong device type from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601
0183	WS IOP detected wrong display size value Perform "TWSC-PIP1 (5077)" on page 525.	FI00601
0184	WS IOP detected wrong keyboard identification Verify that the correct keyboard is attached correctly to the workstation. If the correct keyboard is attached correctly to the workstation, perform "TWSC-PIP1 (5077)" on page 525.	FI00601
0189	Wrong magnetic stripe reader or light pen status Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00605 FI00607 FI00610

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0190	<p>WS IOP detected no status change from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <ol style="list-style-type: none"> 1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314. 2. “INT-PIP14 Station Protectors” on page 320. <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601 FI00610 GLM7777</p>
0191	<p>WS IOP detected busy time-out from device</p> <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00601 FI00610</p>
0200	<p>Device no response time-out; temporary error</p>	<p>FI00604 FI00602 FI00610</p>
0201	<p>WS IOP detected error when transmitting data</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <ol style="list-style-type: none"> 1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314. 2. “INT-PIP14 Station Protectors” on page 320. <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00602 FI00604 GLM7777 GLM8888 FI00610 FI00615 22F0097</p>
0203	<p>WS IOP detected parity error from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <ol style="list-style-type: none"> 1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314. 2. “INT-PIP14 Station Protectors” on page 320. <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00602 FI00604 GLM7777 FI00610</p>
0204	<p>Device detected parity error from WS IOP</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <ol style="list-style-type: none"> 1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314. 2. INT-PIP14 Station Protectors <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00602 FI00604 GLM7777 FI00610</p>

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0205	<p>WS IOP detected error when transmitting data</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <ol style="list-style-type: none"> 1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314. 2. “INT-PIP14 Station Protectors” on page 320. <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00602 FI00604 GLM7777 FI00610 FI00615 22F0097</p>
0206	<p>WS IOP detected wrong data from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <ol style="list-style-type: none"> 1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314. 2. “INT-PIP14 Station Protectors” on page 320. <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00604 FI00602 GLM8888 FI00610</p>
0207	<p>WS IOP detected wrong address from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in “Intermittent Problem Isolation Procedures” on page 313:</p> <ol style="list-style-type: none"> 1. “INT-PIP5 External Noise on Twinaxial Cables” on page 314. 2. INT-PIP14 Station Protectors <p>Perform “TWSC-PIP1 (5077)” on page 525.</p>	<p>FI00604 GLM8888 GLM7777 FI00610</p>
0208	<p>WS IOP detected device power turned off, and then on</p>	<p>GLMEEEE FI00604</p>
0209	<p>WS IOP detected wrong device response to start command</p>	<p>FI00604 FI00610</p>
0210	<p>Printer detected equipment error</p>	<p>FI00604</p>
0211	<p>Printer detected equipment error</p>	<p>FI00604 AJLYD01 FI00610</p>
0212	<p>Printer detected equipment error</p>	<p>FI00604</p>
0220	<p>Device detected wrong command or device ID from WS IOP</p>	<p>FI00604 AJLYD01 FI00610</p>
0221	<p>Device detected not valid value from WS IOP</p>	<p>FI00604 AJLYD01 FI00610</p>
0222	<p>Device detected storage or data overrun</p>	<p>FI00604 AJLYD01 FI00610</p>

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0223	WS IOP detected start command to printer was lost	FI00604 FI00602 FI00610
0224	Device detected wrong start command from WS IOP	FI00604 AJLYD01 FI00610
0225	WS IOP detected wrong exception response from device	FI00604 FI00610
0230 to 0239, 0240 to 0248	Printer detected equipment error	FI00604
0249	WS IOP detected wrong request or response from device	FI00604 FI00610
0258	Printer detected end of ribbon check	FI00604
0281, 0283 to 0289	Printer detected equipment error	FI00604
0290	WS IOP detected no status change from device	FI00604 FI00610
0291	WS IOP detected busy time-out from device	FI00604 FI00610
A000	Too many devices active on the workstation IOP This error occurs if you attempted to activate more workstations than allowed. Switch off power to (or remove) one or more of the display stations (except for the console) that are attached to this workstation I/O processor. Perform an initial program load (IPL) from the control panel to correct the problem. Refer to the local workstation diagrams for the location of workstations if necessary.	GLMBBBB
B000	WS IOP fails to report part, model and serial number Perform "TWSC-PIP1 (5077)" on page 525.	FI00610
C000	WS IOP error not known	AJLYD01 FI00610
D000	Work Station IOA start-up test error	FI00610
D010	WS IOP storage failure corrected Perform TWSC-PIP1 (5077) in "Twinaxial Workstation I/O Processor Problem Isolation Procedures" on page 517.	FI00610
D011	WS IOP card storage failure	FI00610
D021	WS IOP detected errors on all cables	FI00602 FI00601 FI00610 FI00615 22F0097
D022	WS IOP parity errors detected on all cables	FI00602 FI00601 FI00610 FI00615 22F0097

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
D023	WS IOP detected errors on some, but not all cables Perform "TWSC-PIP1 (5077)" on page 525.	FI00602 FI00601 FI00610
E000	WS IOP or IOA error during working operation	AJLYD01 FI00610
F000	WS IOP or IOA operating system program error	AJLYD01
FFFF	User believes there is a problem	ULMFF00

Twinaxial Workstation I/O Processor Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
22F0097	Work station attachment conversion cable	Cable Attachment
AJDG301	Licensed program	Service Functions; APAR or LICTR
AJLYD01	Work Station IOP or IOA system Licensed Internal Code	Service Functions; APAR or LICTR
CLMPDT	Printer definition table	Communications Configuration
GLM7777	Electrical interference	
GLM8888	Other work station on port is failing	
GLM9999	Error occurred with pass-through command	
GLMBBBB	Too many work stations are active on the workstation IOP	
GLMDMCC	Device Licensed Internal Code change	
GLMEEEE	Active device turned off	
MLMFFFF	Magnetic stripe	Refer to I/O device service information
ULMFF00	User believes there is a problem	

(6141) ASCII Workstation I/O Processor Reference Codes

The ASCII workstation I/O processor detected a failure.

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Look at the characters of the Data display for word 3. These 8 characters are the direct select address of the workstation I/O processor card (BBBBcbb). See "Expansion Tower Locations and Addresses" on page 687 and the system configuration list to find the failing part.
3. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.

2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0101	WS IOP detected a transmit complete time-out Perform "ASCII-PIP2" on page 231.	73F9267 59X3816 AJLYC01
0103	Workstation IOP detected parity error from display Perform "ASCII-PIP1" on page 226.	FI00700 CLN000C FI00612 GLN000A 73F9267 59X3816 21F5097
0104	No response received from workstation; idle time-out Please reference "Finding and Correcting Problems" in the <i>ASCII Workstation Reference and Examples</i> , (SA41-9922) manual before attempting further analysis. Before you exchange part 73F9267 or 59X3816, perform "ASCII-PIP2" on page 231.	GLN000D CLN000C GLN000A AJLYC01 73F9267 59X3816 FI00612
0105	Workstation IOP detected overrun error Exchange the first workstation I/O processor card. If this does not correct the problem, ask your next level of support for assistance.	73F9267 59X3816 AJLYC01
0106	Workstation IOP detected framing error from display Perform "ASCII-PIP1" on page 226.	FI00700 CLN000C FI00612 73F9267 59X3816 21F5097
0107	Data sent by WSC not received by workstation Please reference "Finding and Correcting Problems" in the <i>ASCII Workstation Reference and Examples</i> , (SA41-9922) manual before attempting further analysis.	73F9267 GLN000D AJLYC01 GLN000A
0108	Workstation IOP detected Xoff-Xon time-out	GLN000D 73F9267 FI00612
0109	Data sent by workstation not received by WSC Please reference "Finding and Correcting Problems" in the <i>ASCII Workstation Reference and Examples</i> , (SA41-9922) manual before attempting further analysis.	GLN000D CLN000C GLN000A AJLYC01
0111	Workstation IOP detected wrong scan code	AJLYC01 73F9267
0120	WS IOP detected OS/400 licensed program error; device ID	AJLYC01 73F9267
0121	WS IOP detect OS/400 licensed program error; register value	AJLYC01 73F9267

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0122	Workstation IOP detected storage overrun	AJLYC01 73F9267
0123	WS IOP detected null or attribute exception error	AJLYC01 73F9267
0124	Workstation IOP detected a frame error	GLN000D CLN000C GLN000A AJLYC01 73F9267 59X3816
0125	Workstation IOP detected not valid exception status	AJLYC01 73F9267
0126	WS IOP received a frame reject command from workstation	73F9267 GLN000D AJLYC01
0149	WS IOP received unexpected data from workstation Please reference "Finding and Correcting Problems" in the <i>ASCII Workstation Reference and Examples</i> , (SA41-9922) manual before attempting further analysis.	GLN000D
0181	WS IOP DMA receive buffer overrun; SDLC data	CLN000C 73F9267 AJLYC01 GLN000D
0182	WS IOP detect OS/400 licensed program error; bad device type	AJLYC01 73F9267
0183	WS IOP DMA receive buffer overrun; not valid data	CLN000C GLN000D GLN000A 73F9267 59X3816 AJLYC01
0184	WS IOP DMA receive buffer overrun; not valid data	GLN000D GLN000A CLN000C AJLYC01 73F9267 59X3816
0189	WS IOP frame buffer overrun of valid data	CLN000C GLN000D GLN000A 73F9267 59X3816 AJLYC01
0190	Start-up failure Please reference "Finding and Correcting Problems" in the <i>ASCII Workstation Reference and Examples</i> , (SA41-9922) manual before attempting further analysis.	CLN000C GLN000D GLN000A 73F9267 59X3816 AJLYC01

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0192	WS IOP failed automatic line speed detection Please reference "Finding and Correcting Problems" in the <i>ASCII Workstation Reference and Examples</i> , (SA41-9922) manual before attempting further analysis.	CLN000C FI00700 GLN000A AJLYC01 73F9267 59X3816
0193	WS IOP failed automatic device type detection Please reference "Finding and Correcting Problems" in the <i>ASCII Workstation Reference and Examples</i> , (SA41-9922) manual before attempting further analysis.	FI00700 CLN000C GLN000A AJLYC01 73F9267 59X3816
0203	Workstation IOP detected parity error from printer Before you exchange part 73F9267 or 59X3816, perform "ASCII-PIP2" on page 231.	FI00700 CLN000C FI00612 GLN000A 59X3816 73F9267 21F5097
0205	Workstation IOP detected overrun error Perform "ASCII-PIP2" on page 231.	73F9267 59X3816 AJLYC01
0206	Workstation IOP detected framing error from printer Before you exchange part 73F9267 or 59X3816, perform "ASCII-PIP2" on page 231.	FI00700 CLN000C FI00612 59X3816 73F9267 21F5097
0220	WS IOP detected system program error; device identification	AJLYC01 73F9267
0225	Workstation IOP detected not valid exception status	AJLYC01 73F9267
A000	WS IOP detected more than 18 devices varied on; limit 18 There is no failing item. This error occurs if you attempted to activate more workstations than allowed.	GLN000B
A100	WS IOP detected device configuration mismatch There is no failing item. Ensure that the device configuration values for the display and for the auxiliary printer match.	CLN000C
B000	WS IOP fails to report part, model and serial number Perform "ASCII-PIP1" on page 226.	73F9267
C000	WS IOP error not known	73F9267 AJLYC01
D000	Work Station IOA start-up test error	73F9267
D010	WS IOP storage failure corrected Perform "ASCII-PIP1" on page 226.	73F9267
D011	WS IOP card storage failure	73F9267

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
D050	WS IOP asynchronous port errors on all ports	73F9267
D051	WS IOP asynchronous port errors on some ports	73F9267
D060	WS IOP asynchronous errors on all ports Perform "ASCII-PIP2" on page 231.	59X3816 73F9267
D061	WS IOP asynchronous port errors on 12 port attachment only	59X3816
D062	WS IOP asynchronous errors on some ports Both the 12-port ASCII workstation attachment and the first workstation I/O processor card are failing. Exchange the ASCII workstation attachment and the first workstation I/O processor card.	FI00611
D063	WS IOP asynchronous errors on all ports	FI00611
E000	WS IOP or IOA error during working operation Perform "ASCII-PIP2" on page 231.	73F9267 59X3816
F000	WS IOP or IOA operating system program error Before you exchange part 73F9267 or 59X3816, perform "ASCII-PIP2" on page 231. If this does not correct the problem, ask your next level of support for assistance.	AJLYC01 73F9267 59X3816
FFFF	User believes there is a problem	ULNFF00

ASCII Workstation I/O Processor Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
21F5097	6 port ASCII workstation attachment	ASCII workstation reference information
59X3816	12-port ASCII work station attachment	ASCII workstation reference information
73F9267	ASCII work station IOP card	Repair and Parts; removal and installation procedures
AJLYC01	ASCII work station IOP system Licensed Internal Code	Service Functions; APAR or LICTR
CLN000C	Configuration	Communications Configuration
GLN000A	Electrical interference	
GLN000B	More than 18 attempts to vary on device; limit 18	
GLN000D	Programmed workstation with PC Support installed	
ULNFF00	User believes there is a problem	

(6180) Twinaxial Workstation I/O Adapter Reference Codes

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
B904	I/O adapter Licensed Internal Code failed.	AJDGP01 FI00719
B940	I/O adapter hardware error detected	FI00719 FI00718 AJDGP01
B941 to B942	One half of I/O adapter failed.	FI00719 FI00718 AJDGP01

Twinaxial Workstation I/O Adapter Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
AJDGP01	Licensed Internal Code	Service Functions; APAR or LICTR

(632x) Optical Storage Unit Reference Codes

An optical storage unit failure occurred.

Notes:

1. If the system is available, use online diagnostic tests when possible.
2. Search the problem log (WRKPRB) for a recent optical storage entry that may assist in analyzing the problem. The WRKPRB entry will provide a unit reference code that can be found in the following table.
3. Use the verify optical (VFYOPT) command to check that the unit is operating correctly.
1. If the system is available, attempt the failing operation again with an optical media that is known to be good.

Does the operation complete successfully?

No **Yes**

↓ The original optical media may be defective, or the problem may be intermittent.

Attempt the failing operation again with the original optical media to verify.

This ends the procedure.

2. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
3. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
C002	SCSI selection or reselection timeout occurred	FI00870 FI01106 FI01112 MMVMEDA FI01140 FI01141 DEVTERM CDTRAY
C010	Undefined sense key returned by device	FI00870
C020	Device internal configuration error	FI00870
C100	SCSI bus command error occurred	FI00870 FI01106 FI01112 MMVMEDA FI01140 FI01141 DEVTERM CDTRAY
C110	SCSI command timeout occurred	FI00870 FI01106 FI01112 MMVMEDA FI01140 FI01141 DEVTERM CDTRAY
C210	Unexpected device condition recovered The device successfully recovered from a temporary error. No action is required. This reference code is logged for information only.	
C300	Media or device error occurred Perform the following: 1. Clean the disk. 2. Attempt the failing operation again. 3. If this does not correct the problem, exchange the failing items.	MMVMEDA FI00870

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
C333	Incompatible media was detected Perform the following: 1. Verify that the disk has a format that is given support. 2. If the format is given support, clean the disk and attempt the failing operation again. 3. If the operation fails again with the same reference code, ask your media source for a replacement disk.	MMVMEDA FI00870
C400	Interface error detected by device	FI00870 FI01106 FI01112 FI01140 FI01141 DEVTERM CDTRAY
C402	I/O processor internal program error occurred Ask your next level of support for assistance.	FI00130
CFF2	Recovered from device not ready - Start Unit issued The device successfully recovered from a temporary error. No action is required. This reference code is logged for information only.	
CFF4	Internal device error occurred	FI00870
CFF6	Device recovered from error after retries The device successfully recovered from a temporary error. No action is required. This reference code is logged for information only.	
CFF7	Recovered device error The device successfully recovered from a temporary error. No action is required. This reference code is logged for information only.	
CFFE	Recovered SCSI bus error The device successfully recovered from a temporary error. No action is required. This reference code is logged for information only.	
FF3D	Recovered I/O processor error The device successfully recovered from a temporary error. No action is required. This reference code is logged for information only.	
FF6D	Recovered System bus error The device successfully recovered from a temporary error. No action is required. This reference code is logged for information only.	

Optical Storage Unit Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.

2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
CDTRAY	Flex cable	Problem Analysis; Symbolic FRU Isolation
DEVTERM	Device terminator	Problem Analysis; Symbolic FRU Isolation
MMVMEDA	CD-ROM media	System operation information

(6385) Tape Unit Reference Codes

A 1/4-inch tape unit failure occurred.

Note: For tape device and IOP reset procedures, see "TU-PIP4" on page 505.

1. Is the operating system available and can you enter commands from the command line?

Yes No

↓ Go to step 3 of this procedure.
2. Is OS/400 available on the system (see "Determining the Dominant Operating System" in the *AS/400 Service Functions*)?

No Yes

↓ Use the online problem analysis procedures to isolate the problem. Use the WRKPRB (Work with Problem) command to determine if a recent problem was entered in the problem log, or use the VFYTAP (Verify Tape) command to run verification tests.
3. Clean the recording head in the tape unit. Use the correct IBM Cleaning Cartridge Kit:
 - In Canada, the United States, and all other countries use part 46G2674.
4. Attempt the failing operation again.

Does the operation complete successfully?

No Yes

↓ The original data cartridge is defective. The problem has been corrected.

This ends the procedure.
5. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
6. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9020	I/O processor detected a SCSI bus configuration error Before exchanging any parts, verify the following are not present: <ul style="list-style-type: none"> • Tape and DASD devices attached to the same type I/O processor. • A device type or model that is not given support. 	UH1CNFG FI00870 FI00130
9100	Interface error detected by I/O processor or by tape unit Perform "TU-PIP1" on page 497.	FI00870 FI01112 FI01140 FI01106 DEVTERM FI01141
9200	I/O processor addressed the tape unit; no response Perform "TU-PIP1" on page 497.	FI00870 FI01112 FI01106 FI01140 DEVTERM FI01141
9201	Tape unit command timeout Perform "TU-PIP1" on page 497.	FI00870 MH1TMED FI01112 FI01106 FI01140 DEVTERM FI01141
9202	Tape unit failed after Licensed Internal Code was loaded The tape device does not respond to IOP commands after new Licensed Internal Code was transferred to the tape device. Perform "TU-PIP4" on page 505.	FI00870 FI01112 FI01106 FI01141 DEVTERM FI01140
9210	Illegal or unsupported tape unit response	FI00870 FI00130
9300	Tape unit failure Perform "TU-PIP1" on page 497.	FI00870 MH1TMED
9301	Tape device failure, redundancy lost The tape unit detected a hardware failure that does not prevent the tape unit from completing the current operation. Replace the tape unit	FI00870 MH1TMED
9302	Tape device failure or media error	MH1TMED FI00870
9310	Licensed Internal Code for the tape unit is not correct	FI00870 FI00130
9320	Tape device Licensed Internal Code failure	FI00130

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9350	<p>Tape unit detected a read or write error on tape medium</p> <p>A permanent read or write error occurred, and the tape unit determined the tape cartridge is defective.</p> <p>Do the following:</p> <ul style="list-style-type: none"> • Clean the tape drive. • Attempt the operation again. • If this does not correct the problem, exchange the failing items. 	MH1TMED FI00870
9351	<p>Tape with excessive error rate was mounted in tape device.</p> <p>The tape unit detected that the mounted tape cartridge has a history of excessive read and write errors. It is recommended that you exchange the tape cartridge.</p>	MH1TMED FI00870
9355	<p>The data format is incorrect; the tape cannot be read</p> <p>The tape device does not give support to the data format on the tape cartridge. Format the tape cartridge again or use a different tape cartridge.</p>	MH1TMED FI00870
9500	<p>I/O processor Licensed Internal Code error</p> <p>If the system is operational, take a dump of the I/O processor data. For more information call your next level of support or see the service functions manual.</p>	FI00130
9800 to 9803	<p>I/O processor successfully recovered from temporary error</p> <p>No action required. This reference code is logged for information only.</p>	
9810	<p>Problem analysis has determined a part should be replaced.</p> <p>This reference code is use for ending Online Problem Analysis with a list of failing items. (Information only)</p>	
9899	<p>Problem analysis completed, the problem has been corrected.</p> <p>This reference code is used for ending Online Problem Analysis when there is no problem found or the problem has been fixed.</p>	UH1FIXD
9900	<p>Licensed Internal Code for tape unit was not upgraded</p> <p>The I/O processor loading of Licensed Internal Code (LIC) to the programmable tape unit was not completed.</p> <p>The tape unit will continue to operate with the previous LIC. You may do either of the following:</p> <ul style="list-style-type: none"> • Wait for next IPL when the system will attempt to load the LIC for the tape unit again. • Perform "TU-PIP4" on page 505 to reset the IOP and the tape unit. When the IOP is reset, if the device has the wrong level of LIC, the IOP will attempt to load the new LIC. 	
FFF6	Tape volume statistics logged (no action required)	

Tape Unit Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.

3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
DEVTERM	Terminating plug	Problem Analysis; Symbolic FRU Isolation
MH1TMED	Defective removable media	Magnetic tape subsystem service information
UH1CNFG	Tape configuration detected by I/O processor; not valid	Installation
UH1FIXD	Problem no longer exists	Repair and Parts; removal and installation procedures

(6390) Tape Unit Reference Codes

An 8-mm tape unit failure occurred.

Note: For tape device and IOP reset procedures, see "TU-PIP4" on page 505.

1. Is the operating system available and can you enter commands from the command line?

Yes No

↓ Go to step 3 of this procedure.

2. Is OS/400 available on the system (see "Determining the Dominant Operating System" in the *AS/400 Service Functions*)?

No Yes

↓ Use the online problem analysis procedures to isolate the problem. Use the WRKPRB (Work with Problem) command to determine if a recent problem was entered in the problem log, or use the VFYTAP (Verify Tape) command to run verification tests.

3. Clean the recording head in the tape unit. Use the correct IBM Cleaning Cartridge Kit:

- In Canada, the United States, and all other countries use part 16G8467.

4. Attempt the failing operation again.

Does the operation complete successfully?

No Yes

↓ The original data cartridge is defective. The problem has been corrected.

This ends the procedure.

5. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
6. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0001	<p>Tape unit failure</p> <p>The tape drive reported a hardware error to the IOP; the amber light on the tape drive may be blinking.</p> <p>Perform "TU-PIP2" on page 500.</p>	FI00870 MFCTMED
030B	<p>Tape unit detected a read error on the tape medium</p> <p>Read (or write) errors may be caused by:</p> <ul style="list-style-type: none"> • Poor or damaged tape • Dirty read/write heads • Damaged data cartridges • Using a data cartridge previously recorded in a format or density that is not correct • Using the wrong data cartridge (for example, one in a different format or density from another set of data cartridges) <p>If the data on the tape was not written by an AS/400 system, the format or the density may not be correct. Get or make a new copy of the data cartridge.</p> <p>If you are performing a write or a save operation, initialize the tape. See the note below.</p> <p>If you are performing a read or a restore operation, the tape may be worn or the device that wrote the tape may be the cause of the problem.</p> <p>Perform "TU-PIP2" on page 500.</p> <p>When the system is available, verify the operation of the tape drive. Use the VFYTAP system command.</p> <p>Note: When a tape is initialized, a new label is recorded at the beginning of the tape, and any data recorded previously is erased and overwritten. To initialize used tapes, use the INZTAP system command with a "Check for active files" option of *NO.</p> <p>Use of the INZTAP "Clear" (security erase) option is not recommended. The 6390 Tape Drive performs a write operation to erase all of the tape; writing (erasing) a full-size tape takes up to 3.5 hours.</p>	MFCTMED FI00870
0311, 0316	<p>Tape unit detected a read error on the tape medium</p> <p>Perform the action for reference code 030B.</p>	MFCTMED FI00870
031C, 0336	<p>The data format is incorrect; the tape cannot be read</p> <p>The tape format is not known or not compatible. The data cartridge may not have been recorded on an AS/400 system.</p> <p>Get another copy of the data cartridge recorded in a format and density given support by the AS/400 system. For more information, see the <i>System Operation</i> information.</p>	MFCTMED FI00870
0337 to 0338, 033D	<p>Tape unit detected a read error on the tape medium</p> <p>Perform the action for reference code 030B.</p>	MFCTMED FI00870
0395 to 0397, 039D to 039F	<p>Tape unit detected a write error on tape medium</p> <p>Perform the action for reference code 030B.</p>	MFCTMED FI00870

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
03AE, 03B0	Tape unit detected a read or write error on tape medium Perform the action for reference code 030B.	MFCTMED FI00870
03B3 to 03B4	Tape unit detected a write error on tape medium Perform the action for reference code 030B.	MFCTMED FI00870
03B5	Tape unit detected a read error on the tape medium Perform the action for reference code 030B.	MFCTMED FI00870
0417 to 0418	Tape unit failure The tape drive reported a hardware error to the IOP; the amber light on the tape drive may be blinking. Perform "TU-PIP2" on page 500.	FI00870 MFCTMED
0419	Tape unit failure The tape drive reported a hardware error to the IOP; the amber light on the tape drive may be blinking. Perform "TU-PIP2" on page 500.	FI00870 MFCTMED FI01141
0458, 045A, 0467 to 0468, 046D, 0498 to 049A, 049C, 04A1 to 04A8, 04AB to 04AD, 04FA, 04FC to 04FD	Tape unit failure The tape drive reported a hardware error to the IOP; the amber light on the tape drive may be blinking. Perform "TU-PIP2" on page 500.	FI00870 MFCTMED
3002	I/O processor addressed the tape unit; no response The tape drive did not respond to commands from the IOP. Perform the following: 1. "TU-PIP1" on page 497 2. "TU-PIP3" on page 502	FI00870 FI01112 FI01106 FI01140 FI01119 FI01141 DEVTERM
3004	Tape unit failed after Licensed Internal Code was loaded The tape drive does not respond to IOP commands after new Licensed Internal Code was transferred to the tape drive. Perform "TU-PIP4" on page 505.	FI00870 FI01112 FI01106 FI01140 FI01119 FI01141 DEVTERM
3005	Blank tape or BOT encountered The tape drive has found a blank tape or BOT. When using a new data cartridge, the tape must first be initialized. This error can also occur when reading a tape if that tape was removed from the tape drive before writing was complete. Also see the action for reference code 030B.	MFCTMED FI00870 FI00130

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3010	<p>Illegal or unsupported tape unit response</p> <p>The tape drive returned a response to the IOP that is illegal or is not given support.</p> <p>Perform the following:</p> <ol style="list-style-type: none"> 1. "TU-PIP1" on page 497 2. "TU-PIP3" on page 502 	FI00870 FI00130
3100	<p>Interface error detected by I/O processor or by tape unit</p> <p>The IOP or the device detected a permanent error on the interface to the system.</p> <p>Perform the following:</p> <ol style="list-style-type: none"> 1. "TU-PIP1" on page 497 2. "TU-PIP3" on page 502 	FI00870 FI01112 FI01106 FI01140 FI01119 FI01141 FI00130 DEVTERM
3110	<p>Tape unit command timeout</p> <p>The tape drive did not complete a command sent by the IOP in the time allowed.</p> <p>Perform the following:</p> <ol style="list-style-type: none"> 1. "TU-PIP1" on page 497 2. "TU-PIP2" on page 500 	FI00870 FI01112 FI01106 MFCTMED FI01140 FI01119 FI01141 FI00130 DEVTERM
4016 to 4017	Licensed Internal Code for the tape unit is not correct	AJEDA00
9020	I/O processor detected a SCSI bus configuration error	UFCCNFG FI00870 FI00130
9100	Interface error detected by I/O processor or by tape unit	FI00870 FI01112 FI01106 DEVTERM FI01140 FI01141
9200	I/O processor addressed the tape unit; no response	FI00870 FI01112 FI01106 DEVTERM FI01140 FI01141
9201	Tape unit command timeout	FI00870 MFCTMED FI00130 FI01106 FI01112 DEVTERM FI01141 FI01140
9202	<p>Tape unit failed after Licensed Internal Code was loaded</p> <p>The tape device does not respond to IOP commands after new Licensed Internal Code was transferred to the tape device.</p> <p>Perform "TU-PIP4" on page 505.</p>	FI00870 FI01112 FI01106 FI01141 DEVTERM FI01140

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9210	Illegal or unsupported tape unit response	FI00870 FI01112 FI00130
9300	Tape unit failure	FI00870 MFCTMED
9301	Tape device failure, redundancy lost The tape unit detected a hardware failure that does not prevent the tape unit from completing the present operation. See the Tape Unit service information to determine the failing item.	FI00870 MFCTMED
9302	Tape device failure or media error	FI00870 MFCTMED
9310	Licensed Internal Code for the tape unit is not correct	FI00870 FI00130
9320	Tape device Licensed Internal Code failure	FI00130 FI00870
9350	Tape unit detected a read or write error on tape medium	MFCTMED FI00870
9351	Tape with excessive error rate was mounted in tape device. The tape unit detected that the installed tape cartridge has a history of excessive read and write errors. It is recommended that you exchange the tape cartridge.	MFCTMED FI00870
9355	The data format is incorrect; the tape cannot be read The tape format is not known or not compatible. The data cartridge may not have been recorded on an AS/400 system. Get another copy of the data cartridge recorded in a format and density given support by the AS/400 system. For more information, see the <i>System Operation</i> information.	MFCTMED FI00870
9500	I/O processor Licensed Internal Code error If the system is operational, take a dump of the I/O processor data. For more information, see the <i>AS/400 Service Functions</i> information or ask your next level of support for assistance.	FI00130
9800 to 9803	I/O processor successfully recovered from temporary error No action required. This reference code is logged for information only.	
9810	Problem analysis has determined a part should be replaced. This reference code is used for ending Online Problem Analysis with a list of failing items. (Information Only)	
9899	Problem analysis completed, the problem has been corrected. This reference code is used for ending Online Problem Analysis when no problem was found or the problem was corrected.	UFCEFIXD

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9900, FF09	<p>Licensed Internal Code for tape unit was not upgraded</p> <p>The I/O processor loading of Licensed Internal Code (LIC) to the programmable tape drive was not completed.</p> <p>The tape drive will continue to operate with the previous LIC. You may do either of the following:</p> <ul style="list-style-type: none"> • Wait for next IPL when the system will attempt to load the LIC for the tape drive again. • Perform "TU-PIP4" on page 505 to reset the IOP and the tape drive. When the IOP is reset, if the device has the wrong level of LIC, the IOP will attempt to load the new LIC. 	UFCWAIT
FF4D	<p>I/O processor successfully recovered from temporary error</p> <p>No action required. This reference code is logged for information only.</p> <p>When the system is available, display the operator messages, find message CPI946B, and press F14 to run online problem analysis to see if the error threshold has been exceeded.</p>	FI00870 FI01112 FI01106 FI01140 DEVTERM FI01141 FI01119 FI00130
FF5D	<p>I/O processor successfully recovered from temporary error</p> <p>No action required. This reference code is logged for information only.</p> <p>When the system is available, display the operator messages, find message CPI946B, and press F14 to run online problem analysis to see if the error threshold has been exceeded.</p>	FI00870 FI01112 FI01106 FI01140 FI01141 DEVTERM FI01119
FFF6	<p>Tape volume statistics logged (no action required)</p> <p>No action required. This reference code is logged for information only.</p>	
FFF8	<p>Asynchronous device attached; synchronous device expected</p> <p>The attached device is operational and working in the asynchronous mode of data transfer.</p> <p>The IBM tape unit uses the synchronous mode of data transfer; if the attached device is an IBM tape unit, exchange the tape unit.</p>	FI00870
FFFE	<p>Tape unit detected a read error on the tape medium</p> <p>Perform the action for reference code 030B.</p>	MFCTMED FI00870 FI01141
FFFF	<p>Tape unit detected a write error on tape medium</p> <p>Perform the action for reference code 030B.</p>	MFCTMED FI00870

Tape Unit Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
AJEDA00	Licensed Internal Code for the programmable tape unit	Service Functions; APAR or LICTR
DEVTERM	Terminating plug	Problem Analysis; Symbolic FRU Isolation
MFCTMED	Defective removable media	System operation information
UFCCNFG	Tape configuration detected by I/O processor; not valid	Installation
UFCFIXD	Problem no longer exists	Magnetic tape subsystem service information
UFCWAIT	Wait to next IPL or perform TU-PIP4	Problem Analysis

(6500) Magnetic Storage I/O Processor Reference Codes

The magnetic storage I/O processor detected a failure.

1. If the error is reported on the control panel, the unit reference code is characters 5 through 8 of the top 16 character line of function 11. If the error is reported on the console, the unit reference code is the 4 rightmost characters of word 1.
2. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
00A1	I/O processor detected a buffer allocation error	AJEDA00 6500
09A2	I/O processor detected a recoverable system bus error No action required. This reference code is logged for information only.	AJEDA00 6500
0A17	A permanent I/O processor failure occurred	6500 AJEDA00
0A18	I/O processor detected a random interrupt Perform "MSIOP-PIP14" on page 383.	6500 FI00844
0A20	I/O processor resource not available Perform "MSIOP-PIP14" on page 383.	FI00844 6500 AJEDA00
0A21	I/O processor detected a storage transfer error Perform "MSIOP-PIP14" on page 383.	6500 FI00844
0A22	I/O processor detected a storage transfer error	6500 AJEDA00
0A41	I/O processor parity error	6500
0AC9	I/O processor detected a buffer allocation error	AJEDA00 6500 ANYBUS

6500

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0AD0	I/O processor detected a storage sequence error	AJEDA00 6500 ANYBUS
0AD1	A permanent I/O processor failure occurred	6500
1070	I/O processor memory error	6500 AJEDA00
1072	I/O processor Licensed Internal Code error	AJEDA00 6500
1073	I/O processor memory error No action required. This reference code is logged for information only.	6500
1075	I/O processor detected a buffer allocation error See the service information for the specific tape device.	AJEDA00
1076, 107F	I/O processor Licensed Internal Code error	AJEDA00
1A03	I/O processor resource not available	AJEDA00 AJDG301
1A10	I/O processor resource not available The I/O processor error log is being filled faster than the errors are being reported to the system. Check other errors reported to the system and correct them.	6500 FI00844 DEVTERM EXTSCSI AJEDA00 BACKPLN
3000	A permanent I/O processor failure occurred	6500
3002	Disk device returned wrong response to IOP Perform "MSIOP-PIP14" on page 383.	FI00844 FI00581 6500 EXTSCSI
3006	A permanent I/O processor failure occurred	6500 ANYBUS
300D	Disk device problem Perform "MSIOP-PIP14" on page 383.	FI00844 6500
3020	I/O processor detected a SCSI bus configuration error	UDRUSER 6500
3030	Disk bus interface error occurred Perform "MSIOP-PIP14" on page 383.	FI00844 6500
3100	Disk bus interface error occurred Perform "MSIOP-PIP14" on page 383.	6500 FI00844 DEVTERM EXTSCSI
3110	Disk bus interface error occurred Perform "MSIOP-PIP14" on page 383.	FI00844 6500 EXTSCSI DEVTERM
3200	Disk device problem Perform "MSIOP-PIP14" on page 383.	FI00844 FI00581
3400	Failure in initialization of a device task Perform "MSIOP-PIP14" on page 383.	FI00844 6500

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3500	I/O processor Licensed Internal Code error	AJEDA00 6500
3501	I/O processor Licensed Internal Code error	AJEDA00
4002	I/O processor Licensed Internal Code error	AJEDA00 6500
B300 to B301	A permanent I/O processor failure occurred	6500
B701	Read only storage failed, I/O processor is operational No action required. This reference code is logged for information only.	6500
B711	Control storage failed, I/O processor is operational No action required. This reference code is logged for information only.	6500
B720	A permanent I/O processor failure occurred	6500
B740	Reset of the I/O processor header failed	6500
B780	A permanent I/O processor failure occurred	6500 EXTSCSI
B787	I/O processor detected an internal error	6500
B790	A permanent I/O processor failure occurred	6500
B791	I/O processor detected a recoverable device error No action required. This reference code is logged for information only.	
B7A2	Read only storage failed, I/O processor is operational No action required. This reference code is logged for information only.	
B980	Disk bus interface error occurred Perform "MSIOP-PIP14" on page 383.	6500 EXTSCSI FI00844 DEVTERM
B981	Disk bus interface error occurred Perform "MSIOP-PIP14" on page 383.	EXTSCSI FI00844 6500 DEVTERM
B982	I/O processor detected a storage device failure Perform "MSIOP-PIP14" on page 383.	FI00844 FI00581 6500 EXTSCSI DEVTERM
B986	Disk bus interface error occurred Perform "MSIOP-PIP14" on page 383.	FI00844 EXTSCSI 6500 DEVTERM
BB00	System bus error	6500 ANYBUS BACKPLN
BE01	I/O processor was not ready for interrupt that occurred	AJEDA00 6500
BE04	I/O processor Licensed Internal Code error	AJEDA00 6500
BE18	I/O processor detected a random interrupt	6500

6500

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
BE1A	I/O processor was not ready for interrupt that occurred	6500 AJEDA00
BE1B	I/O processor was not ready for interrupt that occurred Perform "MSIOP-PIP14" on page 383.	AJEDA00 6500 EXTSCSI FI00844 DEVTERM
BE1C to BE1E	I/O processor was not ready for interrupt that occurred	AJEDA00 6500
BE40, BE48	A permanent I/O processor failure occurred	6500 AJEDA00
BE50	I/O processor detected a random interrupt	6500
BE51	I/O processor memory error	6500
BE52 to BE54	I/O processor Licensed Internal Code error	AJEDA00 6500
BE55	I/O processor memory error	6500
BE57	A permanent I/O processor failure occurred	6500
BE58	I/O processor detected a random interrupt	6500 AJEDA00
BE60	I/O processor detected a random interrupt	6500
FF3D	I/O processor detected an internal error	6500
FF6D	I/O processor detected a recoverable system bus error	6500 ANYBUS

Magnetic Storage I/O Processor Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
6500	I/O processor card	Repair and Parts; removal and installation procedures
AJDG301	Licensed Internal Code	Service Functions; APAR or LICTR
AJEDA00	I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
ANYBUS	IOP card bus error	Problem Analysis; Symbolic FRU Isolation
BACKPLN	Card Enclosure or Planar Board	Problem Analysis; Symbolic FRU Isolation
DEVTERM	Terminating plug	Problem Analysis; Symbolic FRU Isolation
EXTSCSI	Cable assembly	Problem Analysis; Symbolic FRU Isolation
UDRUSER	Operator/User Error	System operation information

(6501) Magnetic Storage I/O Processor Reference Codes

The magnetic storage I/O processor detected a failure.

1. If the error is reported on the control panel, the unit reference code is characters 5 through 8 of the top 16 character line of function 11. If the error is reported on the console, the unit reference code is the 4 rightmost characters of word 1.
2. Find the unit reference code in the following table.

Note: To determine the I/O bus (SCSI bus) number, see “Expansion Tower Locations and Addresses” on page 687.

Notes:

1. If the failing item is a failing item (FI) code, go to “Failing Items” on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to “Type, Model, and Part Number List” on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to “Symbolic FRUs” on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0A17	A permanent I/O processor failure occurred	6501
0A22	I/O processor detected a storage transfer error	AJ EQU00 6501
1207	I/O processor resource not available	AJ EQU00 AJ DG301
1210	I/O processor resource not available The I/O processor error log is being filled faster than the errors are being reported to the system. Check other errors reported to the system and correct them.	6501 FI00584 AJ EQU00 EXT SCSI DEV TERM ANY BUS
2200	I/O processor Licensed Internal Code error	AJ EQU00
2201	Removable media error during IPL	UQUUSER FI00882
2202	Removable media error during IPL	FI00022 FI00882
3000	A permanent I/O processor failure occurred	6501
3002	Addressed device failed to respond to selection Perform “MSIOP-PIP15” on page 384.	FI00581 EXT SCSI 6501 DEV TERM
3006	System bus error	6501 ANY BUS
3020	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 0.	FI00584 UQUUSER 6501
3021	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 1.	FI00584 UQUUSER 6501

6501

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3030	I/O processor card detected device error Perform "MSIOP-PIP16" on page 386.	FI00581
3080	I/O processor Licensed Internal Code error	AJ EQU00 6501
3084	A permanent I/O processor failure occurred	6501 AJ EQU00
3100	I/O processor card detected interface error Error occurred on SCSI bus 0. Perform "MSIOP-PIP15" on page 384.	FI00844 6501 EXT SCSI DEV TERM
3101	I/O processor card detected interface error Error occurred on SCSI bus 1. Perform "MSIOP-PIP15" on page 384.	FI00844 6501 EXT SCSI DEV TERM
3109, 3110	I/O processor card detected interface error Perform "MSIOP-PIP15" on page 384.	FI00844 6501 EXT SCSI DEV TERM
3136	The removable media device is assigned elsewhere	UQUUSER FI00882 6501
3200	I/O processor card detected device error Perform "MSIOP-PIP16" on page 386.	FI00581
3300	I/O processor card detected media error Perform "MSIOP-PIP16" on page 386.	MQUMEDA FI00581
3400	I/O processor card detected device error Perform "MSIOP-PIP16" on page 386.	FI00581 6501 EXT SCSI DEV TERM
3500	I/O processor Licensed Internal Code error	AJ EQU00 6501
3501	I/O processor Licensed Internal Code error	AJ EQU00
4002	I/O processor Licensed Internal Code error	AJ EQU00 6501
5000	I/O processor card error; logged only	
5100	I/O processor card detected interface error Perform "MSIOP-PIP15" on page 384.	
5500	I/O processor Licensed Internal Code error	
6070	A permanent I/O processor failure occurred	6501
6071 to 6072	I/O processor Licensed Internal Code error	AJ EQU00
6073	I/O processor card detected device error	FI00581 UQUUSER
6075	I/O processor resource not available	AJ EQU00
6076	I/O processor card detected media error	MQUMEDA FI00581

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6081 to 6085	I/O processor Licensed Internal Code error	AJEQU00
B410, B414, B420, B424, B428, B430	A permanent I/O processor failure occurred	6501
B434	I/O processor card detected interface error	6501 FI00844 EXTSCSI DEVTERM
B440	A permanent I/O processor failure occurred	6501
B444	I/O processor card detected interface error	6501 FI00844 EXTSCSI DEVTERM
B450, B460	A permanent I/O processor failure occurred	6501
BE00	I/O processor was not ready for interrupt that occurred	6501 AJEQU00
BE10	I/O processor detected a random interrupt	6501 AJEQU00
BE40, BE70	A permanent I/O processor failure occurred	6501 AJEQU00
FF3D	I/O processor card	6501
FF6D	I/O processor detected a recoverable system bus error	6501 ANYBUS

Magnetic Storage I/O Processor Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
6501	I/O processor card	Repair and Parts; removal and installation procedures
AJDG301	Licensed Internal Code	Service Functions; APAR or LICTR
AJEQU00	I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
ANYBUS	IOP card bus error	Problem Analysis; Symbolic FRU Isolation
DEVTERM	Terminating plug	Problem Analysis; Symbolic FRU Isolation
EXTSCSI	Cable assembly	Problem Analysis; Symbolic FRU Isolation
MQUMEDA	Defective media	Refer to I/O device service information
UQUUSER	Operator/User Error	System operation information

(6502, 6512) Magnetic Storage I/O Processor Reference Codes

The magnetic storage I/O processor detected a failure.

1. If the error is reported on the control panel, the unit reference code is characters 5 through 8 of the top 16 character line of function 11. If the error is reported on the console, the unit reference code is the 4 rightmost characters of word 1.
2. Find the unit reference code in the following table.

Note: To determine the I/O bus (SCSI bus) number, see “Expansion Tower Locations and Addresses” on page 687.

Notes:

1. If the failing item is a failing item (FI) code, go to “Failing Items” on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to “Type, Model, and Part Number List” on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to “Symbolic FRUs” on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0A17	A permanent I/O processor failure occurred	65X2
0A22	I/O processor detected a storage transfer error	AJ EQU00 65X2
1207	I/O processor resource not available	AJ EQU00 AJ DG301
1210	I/O processor resource not available The I/O processor error log is being filled faster than the errors are being reported to the system. Check other errors reported to the system and correct them.	65X2 FI01107 AJ EQU00 FI01140 ANYBUS BACKPLN CACHE
3000	A permanent I/O processor failure occurred	65X2
3002	Addressed device failed to respond to selection Perform “SDIOP-PIP16” on page 423.	FI01105 65X2 FI01140 FI01141 FI01106
3006	System bus error	65X2 ANYBUS
3020	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 0. To correct or isolate a possible user error or configuration error, perform “SDIOP-PIP17” on page 426. Use the failing item (FI) codes to find failing devices.	UAJUSER FI01107 65X2
3021	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 1. To correct or isolate a possible user error or configuration error, perform “SDIOP-PIP17” on page 426. Use the failing item (FI) codes to find failing devices.	UAJUSER FI01107 65X2
3022	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 2. To correct or isolate a possible user error or configuration error, perform “SDIOP-PIP17” on page 426. Use the failing item (FI) codes to find failing devices.	UAJUSER FI01107 65X2
3030	I/O processor card detected device error	FI01105

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3080	I/O processor Licensed Internal Code error	AJ EQU00 65X2
3084	A permanent I/O processor failure occurred	65X2 AJ EQU00
3100	I/O processor card detected interface error Error occurred on SCSI bus 0. Perform "SDIOP-PIP13" on page 420.	65X2 FI01107 FI01140 BACKPLN
3101	I/O processor card detected interface error Error occurred on SCSI bus 1. Perform "SDIOP-PIP13" on page 420.	65X2 FI01107 FI01140 BACKPLN
3102	I/O processor card detected interface error Error occurred on SCSI bus 2. Perform "SDIOP-PIP13" on page 420.	65X2 FI01107 FI01140 BACKPLN
3109	IOP timed out a disk command Perform "SDIOP-PIP16" on page 423.	FI01105 65X2 FI01140 BACKPLN FI01106
3110	I/O processor card detected interface error Perform "SDIOP-PIP16" on page 423.	FI01105 65X2 FI01140 BACKPLN FI01106
3200	I/O processor card detected device error	FI01105
3300	I/O processor Licensed Internal Code error	AJ EQU00 FI01105
3400	I/O processor card detected device error	FI02112 65X2
3500 to 3502	I/O processor Licensed Internal Code error	AJ EQU00 65X2
3600	System log entry only, no service action required	
4002	I/O processor Licensed Internal Code error	AJ EQU00 65X2
5000, 5100, 5500	I/O processor card error; logged only No action required. This reference code is logged for information only.	
6070	A permanent I/O processor failure occurred	65X2
6071	I/O processor Licensed Internal Code error	AJ EQU00
6072	I/O processor Licensed Internal Code error	AJ EQU00 65X2
6073	I/O processor Licensed Internal Code error	AJ EQU00 FI01105
6075	I/O processor resource not available	AJ EQU00
6076	I/O processor Licensed Internal Code error	AJ EQU00 FI01105

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6081 to 6085	I/O processor Licensed Internal Code error	AJ EQU00 65X2
8000	A permanent IOP or cache adaptor card failure occurred. Note: DO NOT replace the IOP and the cache adaptor card at the same time. Exchange the FRUs one at a time in the order shown.	65X2 CACHE
8001	A permanent I/O processor failure occurred	65X2
8002	A permanent cache adaptor card failure occurred. Note: DO NOT replace the IOP and the cache adaptor card at the same time. Exchange the FRUs one at a time in the order shown.	CACHE 65X2
8003	I/O processor Licensed Internal Code error	AJ EQU00
8004	Voltage drop detected on I/O processor 5 volt power supply.	FI01141 65X2
8005	A recoverable IOP or cache adaptor card error occurred. Note: DO NOT replace the IOP and the cache adaptor card at the same time. Exchange the FRUs one at a time in the order shown.	65X2 CACHE
8006	A recoverable I/O processor error occurred.	65X2
8007	A recoverable cache adaptor card error occurred. Note: DO NOT replace the IOP and the cache adaptor card at the same time. Exchange the FRUs one at a time in the order shown.	CACHE 65X2
8010 to 8011	A permanent cache adaptor card failure occurred. The cache adaptor card may be missing, broken or incompatible. Note: DO NOT replace the IOP and the cache adaptor card at the same time. Exchange the FRUs one at a time in the order shown.	CACHE 65X2
9000 to 9001	I/O processor card detected device error	FI01105 65X2
9002	I/O processor card detected device error Perform "SDIOP-PIP16" on page 423.	FI01105 65X2 FI01140 BACKPLN FI01106
9008	Disk unit requires initialization before use. Perform "SDIOP-PIP25" on page 441.	UAJUSER
9010 to 9011	The IOP and attached cache adaptor card are not compatible. Perform "SDIOP-PIP19" on page 431.	SV CDOCS
9012	IOP requires a cache adaptor card but cannot find it. The cache adapter card is missing or broken. Perform "SDIOP-PIP29" on page 448.	CACHE
9013	The IOP and attached cache adaptor card are not compatible. Perform "SDIOP-PIP19" on page 431.	SV CDOCS
9020 to 9021	Array not functional due to present hardware configuration. Perform "SDIOP-PIP20" on page 433.	SV CDOCS

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9022 to 9024	Array not functional due to present hardware configuration. Perform "SDIOP-PIP22" on page 437.	SVCDOS
9025	Disk unit is not supported at its physical location. Perform "SDIOP-PIP21" on page 436.	SVCDOS
9026 to 9027	Array not functional due to present hardware configuration. Perform "SDIOP-PIP22" on page 437.	SVCDOS
9028	Incorrect hardware configuration change has been detected. Reduce the number of arrays on IOP. Either move all devices in an array to another IOP that supports arrays, or stop an array on this IOP.	SVCDOS
9030	Array no longer protected due to missing or failed disk unit Perform "SDIOP-PIP21" on page 436.	SVCDOS
9031, 9040	Array protection temporarily suspended No action required. Protection will be automatically restarted.	
9041	Array protection temporarily suspended Protection will be automatically restarted. Call your next level of support to report the problem.	AJEU00
9050	Required cache data cannot be located for a disk unit. Perform "SDIOP-PIP23" on page 438.	SVCDOS
9051	IOP cache data exists for a missing or failed device. If all configured units are missing, a 9054 reference code may appear in the product activity log. If so, perform the action indicated for the 9054 reference code. Otherwise, perform "SDIOP-PIP27" on page 445.	SVCDOS
9052	Cache data exists for device that has been modified. Perform "SDIOP-PIP28" on page 447.	SVCDOS
9053	IOP resources not available due to previous problems. Take action on other IOP reference codes which have surfaced.	SVCDOS
9054	IOP resources not available due to previous problems. Power off the system and remove all new or replacement disk units. IPL the system to DST. Take action on other IOP reference codes which have surfaced.	SVCDOS
9060	A permanent I/O processor failure occurred	65X2
9081	I/O processor card detected device error	FI01105 65X2
9082	I/O processor card detected device error Perform "SDIOP-PIP16" on page 423.	FI01105 65X2 FI01140 BACKPLN FI01106

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9090	Disk unit has been modified after the last known status. Re-IPL the system. If any reference codes are surfaced, go to "Chapter 2. Unit Reference Codes" on page 17 and use the new reference code as the entry point to the problem. If you cannot resolve the problem, contact your next level of support.	SVCDOS
9091	Incorrect hardware configuration change has been detected. Re-IPL the system. If any reference codes are surfaced, go to "Chapter 2. Unit Reference Codes" on page 17 and use the new reference code as the entry point to the problem. If you cannot resolve the problem, contact your next level of support.	SVCDOS
9092	Disk unit requires initialization before use. Perform "SDIOP-PIP26" on page 443.	SVCDOS
9500	I/O processor Licensed Internal Code error	AJ EQU00 65X2
B410, B414, B420, B424, B428, B430	A permanent I/O processor failure occurred	65X2
B434	I/O processor card detected interface error	65X2 FI01105 FI01140
B440	A permanent I/O processor failure occurred	65X2
B444	I/O processor card detected interface error	65X2 FI01105 FI01140
B450, B460, B470	A permanent I/O processor failure occurred	65X2
B474	I/O processor card detected interface error	65X2 FI01105 FI01140
B480, B484	A permanent I/O processor failure occurred	65X2
B490, B494, B498	A permanent cache adaptor card failure occurred.	CACHE
BE00	I/O processor detected a fault condition.	65X2 AJ EQU00
BE10	I/O processor was not ready for interrupt that occurred	65X2 AJ EQU00
BE40	A permanent I/O processor failure occurred	65X2 AJ EQU00
BE70	A permanent I/O processor failure occurred	AJ EQU00 65X2
FF3D	I/O processor card	65X2
FF6D	I/O processor detected a recoverable system bus error	65X2 ANYBUS

Magnetic Storage I/O Processor Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.

2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
65X2	Magnetic storage device IOP card	Repair and Parts; removal and installation procedures
AJDG301	Licensed Internal Code	Service Functions; APAR or LICTR
AJEQU00	I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
ANYBUS	IOP card bus error	Problem Analysis; Symbolic FRU Isolation
BACKPLN	Card Enclosure or Planar Board	Problem Analysis; Symbolic FRU Isolation
CACHE	Cache adaptor card	Problem Analysis; Symbolic FRU Isolation
SVCDOCS	Customer engineer directed to system problem analysis	Problem Analysis; Symbolic FRU Isolation
UAJUSER	Operator/User Error	System operation information

(6513, 6530) Tape I/O Processor and MSIOP Reference Codes

The tape I/O processor or the MSIOP detected a failure.

1. If the error is reported on the control panel, the unit reference code is characters 5 through 8 of the top 16 character line of function 11. If the error is reported on the console, the unit reference code is the 4 rightmost characters of word 1.
2. Find the unit reference code in the following table.

Note: To determine the I/O bus (SCSI bus) number, see "Expansion Tower Locations and Addresses" on page 687.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0A17	A permanent I/O processor failure occurred	65XX
0A22	I/O processor detected a storage transfer error	AJEQU00 65XX
1207	I/O processor resource not available	AJEQU00 AJDG301
1210	I/O processor resource not available The I/O processor error log is being filled faster than the errors are being reported to the system. Check other errors reported to the system and correct them.	65XX FI01107 AJEQU00 FI01140 ANYBUS BACKPLN
2200	I/O processor Licensed Internal Code error	AJEQU00

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
2201	Removable media error during IPL	UATUSER FI01105
2202	Removable media error during IPL	FI00022 FI01105
3000	A permanent I/O processor failure occurred	65XX
3002	Addressed device failed to respond to selection Perform "SDIOP-PIP16" on page 423.	FI01105 65XX FI01140 FI01141 FI01106
3006	System bus error	65XX ANYBUS
3020	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 0. To correct or isolate a possible user error or configuration error, perform "SDIOP-PIP17" on page 426. Use the failing item (FI) codes to find failing devices.	UATUSER FI01107 65XX
3021	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 1. To correct or isolate a possible user error or configuration error, perform "SDIOP-PIP17" on page 426. Use the failing item (FI) codes to find failing devices.	UATUSER FI01107 65XX
3022	I/O processor detected a SCSI bus configuration error Error occurred on SCSI bus 2. To correct or isolate a possible user error or configuration error, perform "SDIOP-PIP17" on page 426. Use the failing item (FI) codes to find failing devices.	UATUSER FI01107 65XX
3030	I/O processor card detected device error	FI01105
3080	I/O processor Licensed Internal Code error	AJ EQU00 65XX
3084	A permanent I/O processor failure occurred	65XX AJ EQU00
3100	I/O processor card detected interface error Error occurred on SCSI bus 0. Perform "SDIOP-PIP13" on page 420.	65XX FI01107 FI01140 BACKPLN
3101	I/O processor card detected interface error Error occurred on SCSI bus 1. Perform "SDIOP-PIP13" on page 420.	65XX FI01107 FI01140 BACKPLN
3102	I/O processor card detected interface error Error occurred on SCSI bus 2. Perform "SDIOP-PIP13" on page 420.	65XX FI01107 FI01140 BACKPLN
3109, 3110	I/O processor card detected interface error Perform "SDIOP-PIP16" on page 423.	FI01105 65XX FI01140 BACKPLN FI01106

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3136	The removable media device is assigned elsewhere	UATUSER FI01105 65XX
3200	I/O processor card detected device error	FI01105
3300	I/O processor card detected media error	MATMEDA FI01105
3400	I/O processor card detected device error	FI02112 65XX
3500 to 3502	I/O processor Licensed Internal Code error	AJEQU00 65XX
3600	System log entry only, no service action required	
4002	I/O processor Licensed Internal Code error	AJEQU00 65XX
5000, 5100, 5500	I/O processor card error; logged only No action required. This reference code is logged for information only.	
6070	A permanent I/O processor failure occurred	65XX
6071	I/O processor Licensed Internal Code error	AJEQU00
6072	I/O processor Licensed Internal Code error	AJEQU00 65XX
6073	I/O processor card detected device error	FI01105 UATUSER
6075	I/O processor resource not available	AJEQU00
6076	I/O processor card detected media error	MATMEDA FI01105
6081 to 6085	I/O processor Licensed Internal Code error	AJEQU00 65XX
8000 to 8007, 8010 to 8011	I/O processor Licensed Internal Code error	AJEQU00
9000 to 9001	I/O processor card detected device error	FI01105 65XX
9002	I/O processor card detected device error Perform "SDIOP-PIP16" on page 423.	FI01105 65XX FI01140 BACKPLN FI01106
9008	Disk unit requires initialization before use. Perform "SDIOP-PIP25" on page 441.	UATUSER
9010 to 9012, 9020 to 9028, 9030, 9040, 9050 to 9054	I/O processor Licensed Internal Code error	AJEQU00
9060	A permanent I/O processor failure occurred	65XX
9081	I/O processor card detected device error	FI01105 65XX

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9082	I/O processor card detected device error Perform "SDIOP-PIP16" on page 423.	FI01105 65XX FI01140 BACKPLN FI01106
9090	Disk unit has been modified after the last known status. Re-IPL the system. If any reference codes are surfaced, go to "Chapter 2. Unit Reference Codes" on page 17 and use the new reference code as the entry point to the problem. If you cannot resolve the problem, contact your next level of support.	SVCDOS
9091	Incorrect hardware configuration change has been detected. Re-IPL the system. If any reference codes are surfaced, go to "Chapter 2. Unit Reference Codes" on page 17 and use the new reference code as the entry point to the problem. If you cannot resolve the problem, contact your next level of support.	SVCDOS
9092	Disk unit requires initialization before use. Perform "SDIOP-PIP26" on page 443.	SVCDOS
9500	I/O processor Licensed Internal Code error	AJ EQU00
B410, B414, B420, B424, B428, B430	A permanent I/O processor failure occurred	65XX
B434	I/O processor card detected interface error	65XX FI01105 FI01140
B440	A permanent I/O processor failure occurred	65XX
B444	I/O processor card detected interface error	65XX FI01105 FI01140
B450, B460, B470	A permanent I/O processor failure occurred	65XX
B474	I/O processor card detected interface error	65XX FI01105 FI01140
BE00	I/O processor detected a fault condition.	65XX AJ EQU00
BE10	I/O processor was not ready for interrupt that occurred	65XX AJ EQU00
BE40	A permanent I/O processor failure occurred	65XX AJ EQU00
BE70	A permanent I/O processor failure occurred	AJ EQU00 65XX
FF3D	I/O processor card	65XX
FF6D	I/O processor detected a recoverable system bus error	65XX ANYBUS

Tape I/O Processor and MSIOP Failing Items

Notes:

1. To determine the failing items, go to “Failing Items” on page 539.
2. To determine the associated part numbers, go to “Type, Model, and Part Number List” on page 750.
3. To determine the parts associated with symbolic FRUs, such as “ANYBUS”, or “DEVTERM”, go to “Symbolic FRUs” on page 559.

Failing Item	Description	Document Description
65XX	I/O processor card	Repair and Parts; removal and installation procedures
AJDG301	Licensed Internal Code	Service Functions; APAR or LICTR
AJEQU00	I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
ANYBUS	System bus	Problem Analysis; Symbolic FRU Isolation
BACKPLN	Card Enclosure or Planar Board	Problem Analysis; Symbolic FRU Isolation
MATMEDA	Defective media	System operation information
SVCDOCS	Customer engineer directed to system problem analysis	Problem Analysis
UATUSER	Operator/User Error	

(660x, 671x, 673x) Disk Unit Reference Codes

1. If the error is reported on the control panel, the unit reference code is characters 5 through 8 of the top 16 character line of function 11. If the error is reported on the console, the unit reference code is the 4 rightmost characters of word 1.
2. Find the unit reference code in the following table.
If the failing item is a disk unit, go to Start Disk Service Here in “Recovery Procedures” on page 837.

Notes:

1. If the failing item is a failing item (FI) code, go to “Failing Items” on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to “Type, Model, and Part Number List” on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to “Symbolic FRUs” on page 559 to determine the part number.
4. The 673x is a read cache. Perform all actions required for 673x as a disk drive and logic card except where separate 673x cache instructions are provided.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
102E	Out of alternate sectors for disk storage	DISKDRV
3002	Addressed device failed to respond to selection	DISKDRV FI01112 DISKTRY FI01106 FI01141 FI01140 BACKPLN DEVTERM

660x, 671x, 673x

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3010	Disk device returned wrong response to IOP	DISKDRV DISKTRY BACKPLN FI01112 FI01141 FI01140 DEVTERM
3020	Storage subsystem configuration error If an MES is being installed, verify the configuration.	DISKDRV DISKTRY FI01106 FI01112 BACKPLN FI01141 FI01140 DEVTERM
3029	A device replacement has occurred No action required. This reference code is logged for information only.	
3100	Tape/CD or disk bus interface error occurred Perform "DU-PIP3" on page 310.	FI01112 DISKDRV FI01106 DISKTRY FI01141 FI01140 BACKPLN DEVTERM
3109	IOP timed out a disk command	DISKDRV FI01112 FI01106 DISKTRY FI01141 FI01140 BACKPLN DEVTERM
3110	Disk bus interface error occurred Perform "DU-PIP3" on page 310.	FI01112 DISKDRV FI01106 DISKTRY FI01141 FI01140 BACKPLN DEVTERM
3130	Device Licensed Internal Code The device is not supported with the level of code currently on the system. Contact your next level of support.	SVCDOS
7000	Disk sector read error No action required. This reference code is logged for information only.	DISKDRV
7001	Temporary disk data error A disk unit service action is recommended only if the Service Action Log contains an entry for this reference code. For more information about the Service Action Log, see "Hardware Service Manager" in the <i>AS/400 Service Functions</i> .	DISKDRV

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
7003	Device format error If the disk has not been formatted by the system, initialize and format the disk. See "Work with disk unit recovery" in the <i>AS/400 Service Functions</i> .	
7004	System log entry only, no service action required	
7050	Data compression failure Contact your next level of support.	SVCDOS
7051	Compressed device and compression IOA are not compatible The customer should perform the "Recovering From 6xxx7051 SRC" procedure in the <i>Backup and Recovery</i> , SC41-5304-04.	COMPRES1
7052	Data compression warning The customer should perform the "Recovering From 6xxx7052 SRC" procedure in the <i>Backup and Recovery</i> , SC41-5304-04.	SVCDOS
FFF2	Disk motor problem	DISKDRV
FFF3	Disk media format bad	DISKDRV
FFF4	Disk device problem	DISKDRV FI01112
FFF5	Disk sector read error A disk unit service action is recommended only if the Service Action Log contains an entry for this reference code. For more information about the Service Action Log, see "Hardware Service Manager" in the <i>AS/400 Service Functions</i> .	DISKDRV
FFF6	Disk device detected recoverable error A disk unit service action is recommended only if the Service Action Log contains an entry for this reference code. For more information about the Service Action Log, see "Hardware Service Manager" in the <i>AS/400 Service Functions</i> .	DISKDRV
FFF7	Temporary disk data error No action required. This reference code is logged for information only.	DISKDRV
FFF8 to FFF9	Temporary disk data error A disk unit service action is recommended only if the Service Action Log contains an entry for this reference code. For more information about the Service Action Log, see "Hardware Service Manager" in the <i>AS/400 Service Functions</i> .	DISKDRV
FFFA	Temporary disk bus error A disk unit service action is recommended only if the Service Action Log contains an entry for this reference code. For more information about the Service Action Log, see "Hardware Service Manager" in the <i>AS/400 Service Functions</i> .	DISKDRV FI01112 BACKPLN FI01141 FI01140 DEVTERM

660x, 671x, 673x

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
FFFE	<p>Temporary disk bus error</p> <p>A disk unit service action is recommended only if the Service Action Log contains an entry for this reference code. For more information about the Service Action Log, see "Hardware Service Manager" in the <i>AS/400 Service Functions</i>.</p>	DISKDRV FI01112 FI01106 DISKTRY FI01141 FI01140 BACKPLN DEVTERM

Disk Unit Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
BACKPLN	Card enclosure or backplane	Problem Analysis; Symbolic FRU Isolation
COMPRES1	Compressed device and compression IOA are not compatible	Problem Analysis; Symbolic FRU Isolation
DEVTERM	Device terminator	Problem Analysis; Symbolic FRU Isolation
DISKDRV	Disk drive and logic card	Problem Analysis; Symbolic FRU Isolation
STORIOA	Active I/O processor	Problem Analysis; Symbolic FRU Isolation
SVCDOS	Customer engineer directed to system problem analysis	Problem Analysis; Symbolic FRU Isolation

(6A58) Workstation Adapter Console Reference Codes

The workstation adapter console detected a failure.

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0AD2 to 0AD3	Communications adapter card test failed	FI00718
0B25	Communications adapter card test failed	FI00719 FI00718 FI00727

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0BA0, 0BAB, 0BB0, 0BD0 to 0BD1	Communications adapter card test failed	FI00719 FI00718
0BEE	I/O card Licensed Internal Code ended abnormally	FI00719 FI00718
0C10	Communications adapter card test failed	FI00719 FI00718 FI00727
0C20	Communications adapter card test failed	FI00719 FI00718
0C30	Adapter card failed modem interface test	FI00719 FI00718
0C40, 0C43	Synchronous-data-link-control send-receive test failed	FI00719 FI00718
0C50, 0C53	Binary synchronous control send-receive test failed	FI00719 FI00718
0C60, 0C63	Asynchronous send-receive test failed	FI00719 FI00718
0C70, 0C80	Communications adapter card test failed	FI00719 FI00718
0C90	Communications adapter card X.21 test failed	FI00719 FI00718
0CA1, 0CC0	Communications adapter card test failed	FI00719 FI00718
5007	Diagnostic wrap test completed; no errors detected	
5008	Diagnostic wrap test completed; error was detected	FI00719 FI00718
FFFF	User suspected communications problem.	UNAUPPR

Workstation Adapter Console Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
DPAC	Communications two-port adapter cable	Problem Analysis; Symbolic FRU Isolation
UNAUPPR	User suspected communications problem.	

(6A59) Workstation Adapter Console Reference Codes

The workstation adapter console detected a failure.

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0AD2 to 0AD3	Communications adapter card test failed	FI00718
0B25	Communications adapter card test failed	FI00719 FI00718 FI00727
0BA0, 0BAB, 0BB0, 0BD0 to 0BD1	Communications adapter card test failed	FI00719 FI00718
0BEE	I/O card Licensed Internal Code ended abnormally	FI00719 FI00718
0C10	Communications adapter card test failed	FI00719 FI00718 FI00727
0C20	Communications adapter card test failed	FI00719 FI00718
0C30	Adapter card failed modem interface test	FI00719 FI00718
0C40, 0C43	Synchronous-data-link-control send-receive test failed	FI00719 FI00718
0C50, 0C53	Binary synchronous control send-receive test failed	FI00719 FI00718
0C60, 0C63	Asynchronous send-receive test failed	FI00719 FI00718
0C70, 0C80	Communications adapter card test failed	FI00719 FI00718
0C90	Communications adapter card X.21 test failed	FI00719 FI00718
0CA1, 0CC0	Communications adapter card test failed	FI00719 FI00718
5007	Diagnostic wrap test completed; no errors detected	
5008	Diagnostic wrap test completed; error was detected	FI00719 DPAC FI00718
FFFF	User suspected communications problem.	UNAUPPR

Workstation Adapter Console Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
DPAC	Communications two-port adapter cable	Problem Analysis; Symbolic FRU Isolation
UNAUPPR	User suspected communications problem.	

(7208) Tape Drive Reference Codes

An 8-mm tape drive failure occurred.

Note: For tape device and IOP reset procedures, see "TU-PIP4" on page 505.

1. Is the operating system available and can you enter commands from the command line?

Yes No

↓ Go to step 5 of this procedure.

2. Is OS/400 available on the system (see "Determining the Dominant Operating System" in the *AS/400 Service Functions*)?

No Yes

↓ Use the online problem analysis procedures to isolate the problem. Use the WRKPRB (Work with Problem) command to determine if a recent problem was entered in the problem log, or use the VFYTAP (Verify Tape) command to run verification tests.

3. Clean the recording head in the tape unit. Use the correct IBM Cleaning Cartridge Kit:

- In Canada, the United States, and all other countries use part 16G8467.

4. Attempt the failing operation again.

Does the operation complete successfully?

No Yes

↓ The original data cartridge is defective. The problem has been corrected.

This ends the procedure.

5. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.

6. Is the failing tape unit located in a type 9427 Tape Library device?

Yes No

↓ Go to step 8.

7. Go to "(9427) Tape Unit Reference Codes" on page 160.

8. Does the label on the front of the 7208 Tape Drive show 7208-002?

No Yes

↓ See "(7208) Model 002 Tape Drive Reference Codes" on page 148 and find the unit reference code.

9. The label shows 7208-012. See "(7208) Model 012 Tape Drive Reference Codes" on page 151 and find the unit reference code.

(7208) Model 002 Tape Drive Reference Codes**Notes:**

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0001	<p>Tape unit failure</p> <ol style="list-style-type: none"> 1. Look at the In-use lights. If the green light is off and the yellow light is on, the tape unit is indicating an error condition. 2. Switch off power to the tape unit. 3. Switch on power to the tape unit. 4. Clean the recording head in the tape unit. Use the IBM Cleaning Cartridge Kit (part 21F8593). 5. Use a new data cartridge if saving data. <p>Also see the procedure for reference code FFFF.</p>	MLVTMED 91F0914
0002	<p>Tape unit formatter failure</p> <ol style="list-style-type: none"> 1. Look at the In-use lights. If the green light is off and the yellow light is on, the tape unit is indicating an error condition. 2. Switch off power to the tape unit. 3. Switch on power to the tape unit. 4. Clean the recording head in the tape unit. Use the IBM Cleaning Cartridge Kit (part 21F8593). 5. Use a new data cartridge if saving data. <p>Also see the procedure for reference code FFFF.</p>	91F0914 MLVTMED
0003	<p>Tape unit servo failure</p> <ol style="list-style-type: none"> 1. Look at the In-use lights. If the green light is off and the yellow light is on, the tape unit is indicating an error condition. 2. Switch off power to the tape unit. 3. Switch on power to the tape unit. 4. Clean the recording head in the tape unit. Use the IBM Cleaning Cartridge Kit (part 21F8593). 5. Use a new data cartridge if saving data. <p>Also see the procedure for reference code FFFF.</p>	91F0914 MLVTMED
0004	<p>Tape unit motion failure</p> <ol style="list-style-type: none"> 1. Look at the In-use lights. If the green light is off and the yellow light is on, the tape unit is indicating an error condition. 2. Switch off power to the tape unit. 3. Switch on power to the tape unit. 4. Clean the recording head in the tape unit. Use the IBM Cleaning Cartridge Kit (part 21F8593). 5. Use a new data cartridge if saving data. <p>Also see the procedure for reference code FFFF.</p>	MLVTMED 91F0914

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3002	<p>I/O processor addressed the tape unit; no response</p> <p>The tape unit did not respond to a command sent by the IOP.</p> <ol style="list-style-type: none"> 1. Ensure that the tape unit is powered on. If the tape unit does not become powered on, refer to the "Maintenance Analysis Procedures" in the <i>7208 Model 2 8 mm Tape Drive Service Guide, SA23-2640</i>, to analyze the problem. 2. Switch off power to the tape unit. 3. Reseat the signal cable to the tape unit. 4. Reseat the signal cable to the IOP. 5. Switch on power to the tape unit. 	91F0914 81F9128 FI00830 FI00141 91F0721 53F3861 42F7300
3005	<p>Blank tape or BOT encountered</p> <p>The tape unit has found blank tape or BOT.</p> <p>When using a new data cartridge, the tape must first be initialized.</p> <p>This error can also occur when reading a tape if the tape was removed from the tape unit before writing was complete.</p> <p>Also see the procedure for reference code FFFF.</p>	MLVTMED 91F0914 AJEDA00
3010	<p>Illegal or unsupported tape unit response</p> <ol style="list-style-type: none"> 1. Look at the In-use lights. If the green light is off and the yellow light is on, the tape unit is indicating an error condition. 2. Switch off power to the tape unit. 3. Switch on power to the tape unit. 4. Clean the recording head in the tape unit. Use the IBM Cleaning Cartridge Kit (part 21F8593). 5. Use a new data cartridge if saving data. <p>Also see the procedure for reference code FFFF.</p>	91F0914 AJEDA00
3100	<p>IOP to tape unit interface error</p> <ol style="list-style-type: none"> 1. Ensure that the tape unit is powered on. If the tape unit does not become powered on, refer to the "Maintenance Analysis Procedures" in the <i>7208 Model 2 8 mm Tape Drive Service Guide, SA23-2640</i>, to analyze the problem. 2. Switch off power to the tape unit. 3. Reseat the signal cable to the tape unit. 4. Reseat the signal cable to the IOP. 5. Switch on power to the tape unit. 	91F0914 FI00141 FI00830 91F0721 42F7300 53F3861 81F9128 AJEDA00
3110	<p>Tape unit command timeout</p> <p>The tape unit did not complete a command sent by the IOP in the time allowed.</p> <ol style="list-style-type: none"> 1. Ensure that the tape unit is powered on. If the tape unit does not become powered on, refer to the "Maintenance Analysis Procedures" in the <i>7208 Model 2 8 mm Tape Drive Service Guide, SA23-2640</i>, to analyze the problem. 2. Switch off power to the tape unit. 3. Reseat the signal cable to the tape unit. 4. Reseat the signal cable to the IOP. 5. Switch on power to the tape unit. 	91F0914 FI00141 FI00830 91F0721 42F7300 53F3861 81F9128 AJEDA00

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
FF4D	IOP to tape unit interface error; logged only No action required. This reference code is logged for information only.	
FF5D	Tape unit response error; logged only No action required. This reference code is logged for information only.	
FFF6	Volume statistics; logged only No action required. This reference code is logged for information only.	
FFFE	Read data error: tape path dirty This error may be caused by a dirty recording head, poor or damaged tapes, worn or damaged data cartridges, or using a format that is not correct. 1. Switch off power to the tape unit. 2. Switch on power to the tape unit. 3. Clean the recording head in the tape unit. Use the IBM Cleaning Cartridge Kit (part 21F8593). 4. Visually inspect the data cartridge. If it is damaged, discard it. 5. Check the lifetime statistics on the system for this tape volume ID (see the <i>System Operation</i> information). If the cartridge has a history of tape errors, discard it. If the data on the tape was not written by an AS/400 system, the format may not be correct. Do not use the cleaning cartridge more than 12 times. Each data cartridge must have a unique volume ID label. The user must assign a volume ID when the tape is initialized (INZTAP).	MLVTMED 91F0914
FFFF	Write data error: tape path dirty This error may be caused by a dirty recording head, poor or damaged tapes, worn or damaged data cartridges, or using a format that is not correct. 1. Switch off power to the tape unit. 2. Switch on power to the tape unit. 3. Clean the recording head in the tape unit. Use the IBM Cleaning Cartridge Kit (part 21F8593). 4. Visually inspect the data cartridge. If it is damaged, discard it. 5. Check the lifetime statistics on the system for this tape volume ID (see the <i>System Operation</i> information). If the cartridge has a history of tape errors, discard it. If the data on the tape was not written by an AS/400 system, the format may not be correct. Do not use the cleaning cartridge more than 12 times. Each data cartridge must have a unique volume ID label. The user must assign a volume ID when the tape is initialized (INZTAP).	MLVTMED 91F0914

Model 002 Tape Drive Failing Items

Notes:

1. To determine the failing items, go to “Failing Items” on page 539.
2. To determine the associated part numbers, go to “Type, Model, and Part Number List” on page 750.
3. To determine the parts associated with symbolic FRUs, such as “ANYBUS”, or “DEVTERM”, go to “Symbolic FRUs” on page 559.

Failing Item	Description	Document Description
42F7300	Fan	7208 8mm Tape Drive service information
53F3861	Internal signal cable	7208 8mm Tape Drive service information
81F9128	Power supply	7208 8mm Tape Drive service information
91F0721	Terminating plug	7208 8mm Tape Drive service information
91F0914	Tape drive	7208 8mm Tape Drive service information
AJEDA00	I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
MLVTMED	Defective removable media	7208 8mm Tape Drive service information

(7208) Model 012 Tape Drive Reference Codes

Notes:

1. If the failing item is a failing item (FI) code, go to “Failing Items” on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to “Type, Model, and Part Number List” on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to “Symbolic FRUs” on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0001	<p>Tape unit failure</p> <p>The tape drive reported a hardware error to the IOP; the amber light on the tape drive may be blinking.</p> <p>Perform “TU-PIP2” on page 500.</p>	46G2227 ML2TMED

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
030B	<p>Tape unit detected a read error on the tape medium</p> <p>Read (or write) errors may be caused by:</p> <ul style="list-style-type: none"> • Poor or damaged tape • Dirty read/write heads • Damaged data cartridges • Using a data cartridge previously recorded in a format or density that is not correct • Using the wrong data cartridge (for example, one in a different format or density from another set of data cartridges) <p>If the data on the tape was not written by an AS/400 system, the format or the density may not be correct. Get or make a new copy of the data cartridge.</p> <p>If you are performing a write or a save operation, initialize the tape. See the note below.</p> <p>If you are performing a read or a restore operation, the tape may be worn or the device that wrote the tape may be the cause of the problem.</p> <p>Perform "TU-PIP2" on page 500.</p> <p>When the system is available, perform the following:</p> <ul style="list-style-type: none"> • Verify the operation of the tape drive. Use the VFYTAP system command. <p>Note: When a tape is initialized, a new label is recorded at the beginning of the tape, and any data recorded previously is erased and overwritten. To initialize used tapes, use the INZTAP system command with "Check for active files" option of *NO.</p> <p>Use of the INZTAP "Clear" (security erase) option is not recommended. The 7208 Tape Drive performs a write operation to erase all of the tape; writing (erasing) a full-size tape takes up to 3.5 hours.</p>	ML2TMED 46G2227 46G3934 42F7300
0311, 0316	<p>Tape unit detected a read error on the tape medium</p> <p>Perform the Action for reference code 030B.</p>	ML2TMED 46G2227 46G3934 42F7300
031C	<p>The data format is incorrect; the tape cannot be read</p> <p>The tape format is not known or not compatible. The data cartridge may not have been recorded on an AS/400 system.</p> <p>Get another copy of the data cartridge recorded in a format and density given support by the AS/400 system (see the <i>System Operation</i> information).</p>	ML2TMED 46G2227
0336	<p>The data format is incorrect; the tape cannot be read</p> <p>The tape format is not known or not compatible. The data cartridge may not have been recorded on an AS/400 system.</p> <p>Get another copy of the data cartridge recorded in a format and density given support by the AS/400 system (see the <i>System Operation</i> information).</p>	ML2TMED 46G2227 46G3934 42F7300
0337 to 0338, 033D	<p>Tape unit detected a read error on the tape medium</p> <p>Perform the Action for reference code 030B.</p>	ML2TMED 46G2227 46G3934 42F7300

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0395 to 0397, 039D to 039F	Tape unit detected a write error on tape medium Perform the Action for reference code 030B.	ML2TMED 46G2227
03AE, 03B0	Tape unit detected a read or write error on tape medium Perform the Action for reference code 030B.	ML2TMED 46G2227
03B3 to 03B4	Tape unit detected a write error on tape medium Perform the Action for reference code 030B.	ML2TMED 46G2227
03B5	Tape unit detected a read error on the tape medium Perform the Action for reference code 030B.	ML2TMED 46G2227
0417 to 0419, 0458, 045A, 0467 to 0468, 046D, 0498 to 049A, 049C, 04A1 to 04A8, 04AB to 04AD, 04FA, 04FC to 04FD	Tape unit failure The tape drive reported a hardware error to the IOP; the amber light on the tape drive may be blinking. Perform "TU-PIP2" on page 500.	46G2227 ML2TMED 46G3934 42F7300
3002	I/O processor addressed the tape unit; no response The tape drive did not respond to commands from the IOP. Perform the following: 1. Ensure that the system interface cable is connected. 2. Ensure that power is on. If the above items are correct, perform the following: 1. "TU-PIP1" on page 497. 2. "TU-PIP3" on page 502.	46G2227 46G3934 FI00830 FI00141 46G2599 17G1500 42F7300
3004	Tape unit failed after Licensed Internal Code was loaded The tape drive does not respond to IOP commands after new Licensed Internal Code was transferred to the tape drive. Perform "TU-PIP4" on page 505.	46G2227
3005	Blank tape or BOT encountered The tape drive has found a blank tape or BOT. When using a new data cartridge, the tape must first be initialized. This error can also occur when reading a tape if that tape was removed from the tape drive before writing was complete. Also see the Action for reference code 030B.	ML2TMED 46G2227 AJEDA00
3010	Illegal or unsupported tape unit response The tape drive returned a response to the IOP that is illegal or is not given support. Perform the following: 1. "TU-PIP1" on page 497. 2. TU-PIP3 in "Tape Unit Problem Isolation Procedures" on page 497	46G2227 AJEDA00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3100	<p>Interface error detected by I/O processor or by tape unit</p> <p>The IOP or the device detected a permanent error on the interface to the system.</p> <p>Perform the following:</p> <ol style="list-style-type: none"> 1. "TU-PIP1" on page 497. 2. "TU-PIP3" on page 502. 	46G2227 FI00141 FI00830 46G2599 42F7300 17G1500 46G3934 AJEDA00
3110	<p>Tape unit command timeout</p> <p>The tape drive did not complete a command sent by the IOP in the time allowed.</p> <p>Perform the following:</p> <ol style="list-style-type: none"> 1. "TU-PIP1" on page 497. 2. TU-PIP2 in "Tape Unit Problem Isolation Procedures" on page 497 	46G2227 FI00141 FI00830 46G2599 42F7300 17G1500 46G3934 AJEDA00
4016 to 4017	Licensed Internal Code for the tape unit is not correct	AJEDA00
9020	<p>I/O processor detected a SCSI bus configuration error</p> <p>Before exchanging any parts, verify that the following conditions are not present:</p> <ul style="list-style-type: none"> • Tape and DASD devices attached to an I/O Processor that does not support attachment of both tape and DASD devices at the same time. • A device type or model that is not given support. 	UL2CNFG 46G2227 FI00130
9100	<p>Interface error detected by I/O processor or by tape unit</p> <p>Before exchanging any parts, do the following:</p> <ol style="list-style-type: none"> 1. Ensure that the device is powered on. 2. Ensure that the SCSI cable between the device and the I/O Processor or I/O Adaptor is seated correctly, and that there are no bent or damaged pins on the SCSI cable. 3. Ensure that a terminating plug is attached to the device. 	46G2227 FI00131 46G3934 FI00830 46G2599 17G1500
9200	<p>I/O processor addressed the tape unit; no response</p> <p>Before exchanging any parts, do the following:</p> <ol style="list-style-type: none"> 1. Ensure that the device is powered on. 2. Ensure that the SCSI cable between the device and the I/O Processor or I/O Adaptor is seated correctly, and that there are not bent or damaged pins on the SCSI cable. 3. Ensure that the terminating plug is attached to the device. 	46G2227 46G3934 FI00830 FI00131 46G2599 17G1500 42F7300
9201	<p>Tape unit command timeout</p> <p>Before exchanging any parts, do the following:</p> <ol style="list-style-type: none"> 1. Ensure that the device is powered on. 2. Ensure that the SCSI cable between the device and the I/O Processor or I/O Adaptor is seated correctly, and that there are not bent or damaged pins on the SCSI cable. 3. Ensure that the terminating plug is attached to the device. 	46G2227 46G3934 FI00830 FI00131 46G2599 17G1500 42F7300

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9202	<p>Tape unit failed after Licensed Internal Code was loaded</p> <p>Before exchanging any parts, do the following:</p> <ol style="list-style-type: none"> 1. Ensure that the device is powered on. 2. Ensure that the SCSI cable between the device and the I/O Processor or I/O Adaptor is seated correctly, and that there are not bent or damaged pins on the SCSI cable. 3. Ensure that the terminating plug is attached to the device. 	<p>46G2227 46G3934 FI00830 FI00131 46G2599 17G1500 42F7300</p>
9210	Illegal or unsupported tape unit response	<p>46G2227 FI00130 FI00131</p>
9300	<p>Tape unit failure</p> <p>The tape drive reported a hardware error to the IOP; the amber light on the tape drive may be blinking.</p> <p>Perform "TU-PIP2" on page 500.</p>	<p>46G2227 ML2TMED 46G3934 42F7300</p>
9301	<p>Tape device failure, redundancy lost</p> <p>The tape device detected a hardware failure that does not prevent the tape unit from completed the current operation.</p> <p>Refer to the Tape unit service information to determine the failing item.</p>	<p>46G2227 ML2TMED 46G3934 42F7300</p>
9302	<p>Tape device failure or media error</p> <p>The tape unit detected a failure that may be caused by a hardware failure or a media error.</p> <p>Refer to the tape unit service information for possible information on diagnostic tests that can be run to isolate between hardware and media failures.</p>	<p>ML2TMED 46G2227 46G3934 42F7300</p>
9310	Licensed Internal Code for the tape unit is not correct	<p>46G2227 FI00130</p>
9320	Tape device Licensed Internal Code failure	<p>FI00130 46G2227</p>
9350	<p>Tape unit detected a read or write error on tape medium</p> <p>A permanent read or write error occurred. Clean the tape unit and retry the operation.</p> <p>If cleaning the tape unit does not correct the problem, exchange the tape media.</p>	<p>ML2TMED 46G2227 46G3934 42F7300</p>
9351	<p>Tape with excessive error rate was mounted in tape device.</p> <p>The tape unit detected that the mounted tape cartridge has a history of excessive read and write errors. It is recommended that you exchange the tape cartridge.</p>	<p>ML2TMED UL2CLN 46G2227</p>
9355	<p>The data format is incorrect; the tape cannot be read</p> <p>The tape unit has detected that the data format on the tape media is not supported.</p> <p>Clean the tape unit and retry the operation.</p> <p>If the operation continues to fail, use a different tape cartridge.</p>	<p>UL2USR1 ML2TMED UL2CLN 46G2227</p>

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9500	I/O processor Licensed Internal Code error If the system is operational, take a dump of the I/O processor data. For more information, see the <i>AS/400 Service Functions</i> information or ask your next level of support for assistance.	FI00130
9800 to 9803	I/O processor successfully recovered from temporary error No action required. This reference code is logged for information only.	
9810	Problem analysis has determined a part should be replaced. This reference code is used for ending Online Problem Analysis with a list of failing items. (Information only)	
9899	Problem analysis completed, the problem has been corrected. This reference code is used for ending Online Problem Analysis when no problem was found or the problem was corrected.	UL2FIXD
9900, FF09	Licensed Internal Code for tape unit was not upgraded The I/O processor loading of Licensed Internal Code (LIC) to the programmable tape drive was not completed. The tape drive will continue to operate with the previous LIC. You may do either of the following: <ul style="list-style-type: none"> • Wait for next IPL when the system will attempt to load the LIC for the tape drive again. • Perform "TU-PIP4" on page 505 to reset the IOP and the tape drive. When the IOP is reset, if the device has the wrong level of LIC, the IOP will attempt to load the new LIC. 	UL2WAIT
FF4D	I/O processor successfully recovered from temporary error No action required. This reference code is logged for information only. When the system is available, display the operator messages, find message CPI946B, and press F14 to run online problem analysis to see if the error threshold has been exceeded.	46G2227 FI00141 FI00830 46G2599 46G3934 17G1500 42F7300 AJEDA00
FF5D	I/O processor successfully recovered from temporary error No action required. This reference code is logged for information only. When the system is available, display the operator messages, find message CPI946B, and press F14 to run online problem analysis to see if the error threshold has been exceeded.	46G2227 46G3934 FI00830 FI00141 46G2599 17G1500 42F7300
FFF6	Tape volume statistics logged (no action required) No action required. This reference code is logged for information only.	
FFF8	Asynchronous device attached; synchronous device expected The attached device is operational and working in the asynchronous mode of data transfer. The IBM tape unit uses the synchronous mode of data transfer; if the attached device is an IBM tape unit, exchange the tape unit.	46G2227

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
FFFE	Tape unit detected a read error on the tape medium Perform the Action for reference code 030B.	ML2TMED 46G2227 46G3934 42F7300
FFFF	Tape unit detected a write error on tape medium Perform the Action for reference code 030B.	ML2TMED 46G2227

Model 012 Tape Drive Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
17G1500	Internal signal cable	7208 Model 012 5.0GB External 8mm Tape Drive Service Guide
42F7300	Fan	7208 Model 012 5.0GB External 8mm Tape Drive Service Guide
46G2227	Tape drive	7208 Model 012 5.0GB External 8mm Tape Drive Service Guide
46G2599	Terminating plug	7208 Model 012 5.0GB External 8mm Tape Drive Service Guide
46G3934	Power supply	7208 Model 012 5.0GB External 8mm Tape Drive Service Guide
AJEDA00	I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
ANYBUS	IOP card bus error	Problem Analysis; Symbolic FRU Isolation
ML2TMED	Defective removable media	7208 Model 012 5.0GB External 8mm Tape Drive Service Guide
UL2CLN	Tape unit needs cleaning	Magnetic tape subsystem operator's information
UL2CNFG	Tape configuration detected by I/O processor; not valid	Magnetic tape subsystem operator's information
UL2USR1	Operator action required	Magnetic tape subsystem operator's information
UL2WAIT	Wait to next IPL or perform TU-PIP4	Problem Analysis

(9331) Diskette Unit Reference Codes

A 9331 Diskette Unit failure occurred.

1. Power off the unit, then power on the unit.

Note: If the unit does not have a Power switch, power off, then power on the system.

2. Verify that the 9331 is powered on.
3. Verify that the interface cable connections are correct for each 9331.

4. If this does not correct the problem, look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
5. See the *9331 Diskette Unit Service Information: Service Guide and Reference Code Guide* and find the unit reference code.

(9337) Disk Unit Reference Codes

A 9337 Disk Unit failure occurred.

Before exchanging a FRU containing a disk drive, go to “Start Disk Service Here” in the “Recovery Procedures” chapter of the *FC 504x Problem Analysis and Repair and Parts* to save customer data.

1. Verify that the 9337 is powered on.
2. Verify that the interface cable connections are correct for each 9337.
3. If the problem is displayed on the control panel or is filled out on the problem summary form, characters 5 through 8 of the top 16 character line of function 11 is the unit reference code. If the problem is displayed using WRKPRB, the four rightmost characters of the “System reference code” field is the unit reference code.
4. If these 4 characters are 0000, no unit reference code is available. This condition occurs when a 9337 error is detected, but the 9337 is not responding. See the *9337 Disk Array Service Information* for problem analysis.
5. If these 4 characters are **not** 0000, see the *9337 Disk Array Service Information* for the specific reference code.
 - If the “9337 Problem Recovery Procedures” in the “9337 Unit Reference Code” section of the *9337 Disk Array Service Information* need system support functions to perform a problem recovery procedure, see the “Recovery Procedures” chapter of the *FC 504x Problem Analysis and Repair and Parts* for the correct procedure.
 - The 4 rightmost characters of the bottom 16 character line of function 12 (4 rightmost characters of word 5) consist of a 1-character level code and a 3-character model number.
 - The first 8 characters of the bottom 16 character line of function 13 (word 8) is the serial number of the 9337.
 - The first 8 characters of the top 16 character line of function 13 (word 6) is the controller.
 - The last 8 characters of the top 16 character line of function 12 (word 3) is the direct select address.

Note: See “System Addressing Schemes” in the “Service Reference”

Note: “Procedures and Information” chapter of the *FC 504x Problem Analysis and Repair and Parts* to help find the failing disk unit.

- The fourth character of the bottom 16 character line of function 12 (fourth character of word 4) is the 9337 actuator address.
- If the problem is displayed using WRKPRB, the following fields are useful:
 - “Model” field
 - “Serial number” field
 - Address information (see “SRC Address Formats” on page 878 for more information about addresses).

Note: For 9337, the “actuator address” is equivalent to the “device address”.

(9347) Tape Unit Reference Codes

A tape or a 9347 Tape Unit failure occurred.

Note: If the system is available, use the online diagnostic tests when possible. Use WRKPRB (the Work with Problem command) to determine if a recent problem has been entered in the problem log, or use VFYTAP (the Verify Tape command). Other helpful commands are WRKHDWRSC *STG (Work with Hardware Resources) and WRKCFGSTS *DEV *TAP (Work with Configuration Status). For tape device and IOP reset procedures, see "TU-PIP4" on page 505.

1. Verify that the 9347 Tape Unit is powered on.
2. Verify that the address switch setting and the interface cable connections are correct for each 9347 Tape Unit.
3. Clean the tape path as described in the *9347 Tape Unit Service Guide*
4. Load the first tape.
5. Start a type D IPL from the system unit control panel.
6. Does the IPL complete successfully?

No **Yes**

↓ The problem has been corrected.

This ends the procedure.

7. Obtain another copy of the tape. Repeat steps 4 and 5 using the new tape. If this does not correct the problem, continue with step 8.
8. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
9. If the tape unit indicator panel shows an error condition, see the *9347 Tape Unit Service Guide* for more information.
10. See the *9347 Tape Unit Service Guide* and find the unit reference code.

(9348) Tape Unit Reference Codes

A tape or a 9348 Tape Unit failure occurred.

Note: If the system is available, use the online diagnostic tests when possible. Use WRKPRB (the Work with Problem command) to determine if a recent problem has been entered in the problem log, or use VFYTAP (the Verify Tape command). Other helpful commands are WRKHDWRSC *STG (Work with Hardware Resources) and WRKCFGSTS *DEV *TAP (Work with Configuration Status). For tape device and IOP reset procedures, see "TU-PIP4" on page 505.

1. Verify that the 9348 Tape Unit is powered on.
 2. Verify that the interface cable connections are correct for each 9348 Tape Unit.
 3. Clean the tape path as described in the *9348 Tape Unit Service Information*
 4. Load the first tape.
 5. Start a type D IPL from the system unit control panel.
- Does the IPL complete successfully?

No **Yes**

↓ The problem has been corrected.

This ends the procedure.

6. Obtain another copy of the tape. Repeat steps 4 and 5 using the new tape. If this does not correct the problem, continue with step 7.
7. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
8. If the tape unit indicator panel shows an error condition, see the *9348 Tape Unit Service Information* and find the unit reference code.

(9427) Tape Unit Reference Codes

The tape library detected a failure.

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0001	Tape unit failure Refer to the 9427 8mm Tape Cartridge Library Service Guide.	
03xx	Tape unit detected a read error on the tape medium Read (or write) errors may be caused by: <ul style="list-style-type: none"> • Poor or damaged tape • Dirty read/write heads • Damaged data cartridges • Using a data cartridge previously recorded in a format or density that is not correct • Using the wrong data cartridge (for example, one in a different format or density from another set of data cartridges) Do the following: <ol style="list-style-type: none"> 1. Clean the tape unit and retry the operation. 2. If cleaning the tape unit does not correct the problem, exchange the tape media. Refer to the 9427 8mm Tape Cartridge Library Service Guide for additional information.	
04xx	Tape unit failure The tape drive reported a hardware error to the IOP; the amber light on the tape drive may be blinking. Refer to the 9427 8mm Tape Cartridge Library Service Guide.	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3xxx	Device or interface error. Refer to the 9427 8mm Tape Cartridge Library Service Guide.	
4016 to 4017	Licensed Internal Code for the tape unit is not correct	AJEDA00
9020	I/O processor detected a SCSI bus configuration error Before exchanging any parts, verify that the following conditions are not present: <ul style="list-style-type: none"> • Tape and DASD devices attached to an I/O Processor that does not support attachment of both tape and DASD devices at the same time. • A device type or model that is not given support. 	ULYCNFG 86G9251 FI00130 86G9254
9100	Interface error detected by I/O processor or by tape unit Before exchanging any parts, do the following: <ol style="list-style-type: none"> 1. Ensure that the device is powered on. 2. Ensure that the SCSI cable between the device and the I/O Processor or I/O Adaptor is seated correctly, and that there are no bent or damaged pins on the SCSI cable. 3. Ensure that a terminating plug is attached to the device. 	86G9251 FI00131 86G9254 EXTSCSI 86G9255 86G9274 17G1934 FI00130
9200	I/O processor addressed the tape unit; no response Before exchanging any parts, do the following: <ol style="list-style-type: none"> 1. Ensure that the device is powered on. 2. Ensure that the SCSI cable between the device and the I/O Processor or I/O Adaptor is seated correctly, and that there are not bent or damaged pins on the SCSI cable. 3. Ensure that the terminating plug is attached to the device. 	86G9251 86G9274 86G9254 FI00131 EXTSCSI 17G1934 87G1531 86G9255
9201	Tape unit command timeout Before exchanging any parts, do the following: <ol style="list-style-type: none"> 1. Ensure that the device is powered on. 2. Ensure that the SCSI cable between the device and the I/O Processor or I/O Adaptor is seated correctly, and that there are not bent or damaged pins on the SCSI cable. 3. Ensure that the terminating plug is attached to the device. 	86G9251 FI00131 86G9254 EXTSCSI 17G1934 86G9255 86G9274 FI00130

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9202	<p>Tape unit failed after Licensed Internal Code was loaded</p> <p>Before exchanging any parts, do the following:</p> <ol style="list-style-type: none"> 1. Ensure that the device is powered on. 2. Ensure that the SCSI cable between the device and the I/O Processor or I/O Adaptor is seated correctly, and that there are not bent or damaged pins on the SCSI cable. 3. Ensure that the terminating plug is attached to the device. 	86G9251 86G9274 86G9254
9210	Illegal or unsupported tape unit response	86G9251 FI00130 FI00131
9300	<p>Tape unit failure</p> <p>The tape drive reported a hardware error to the IOP; the amber light on the tape drive may be blinking.</p> <p>Perform "TU-PIP2" on page 500.</p>	86G9251 LIBDEV MLYTMED 86G9274 86G9255
9301	<p>Tape device failure, redundancy lost</p> <p>The tape device detected a hardware failure that does not prevent the tape unit from completed the current operation.</p> <p>Refer to the Tape unit service information to determine the failing item.</p>	86G9251 LIBDEV MLYTMED 86G9274 86G9255
9302	<p>Tape device failure or media error</p> <p>The tape unit detected a failure that may be caused by a hardware failure or a media error.</p> <p>Refer to the tape unit service information for possible information on diagnostic tests that can be run to isolate between hardware and media failures.</p>	MLYTMED 86G9251
9310	Licensed Internal Code for the tape unit is not correct	86G9251 FI00130
9320	Tape device Licensed Internal Code failure	FI00130 86G9251
9350	<p>Tape unit detected a read or write error on tape medium</p> <p>A permanent read or write error occurred. Clean the tape unit and retry the operation.</p> <p>If cleaning the tape unit does not correct the problem, exchange the tape media.</p>	MLYTMED 86G9251
9351	<p>Tape with excessive error rate was mounted in tape device.</p> <p>The tape unit detected that the mounted tape cartridge has a history of excessive read and write errors. It is recommended that you exchange the tape cartridge.</p>	MLYTMED ULYCLN 86G9251

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9355	<p>The data format is incorrect; the tape cannot be read</p> <p>The tape unit has detected that the data format on the tape media is not supported.</p> <p>Clean the tape unit and retry the operation.</p> <p>If the operation continues to fail, use a different tape cartridge.</p>	ULYUSR1 MLYTMED ULYCLN 86G9251
9500	<p>I/O processor Licensed Internal Code error</p> <p>If the system is operational, take a dump of the I/O processor data. For more information, see the <i>AS/400 Service Functions</i> information or ask your next level of support for assistance.</p>	FI00130
9600	<p>Equipment Check Failure on Library Device.</p> <p>See library device service information to resolve the error.</p>	LIBDEV
9800 to 9803	<p>I/O processor successfully recovered from temporary error</p> <p>No action required. This reference code is logged for information only.</p>	
9810	<p>Problem analysis has determined a part should be replaced.</p> <p>This reference code is used for ending Online Problem Analysis with a list of failing items. (Information only)</p>	
9899	<p>Problem analysis completed, the problem has been corrected.</p> <p>This reference code is used for ending Online Problem Analysis when no problem was found or the problem was corrected.</p>	ULYFIXD
9900	<p>Licensed Internal Code for tape unit was not upgraded</p> <p>The I/O processor loading of Licensed Internal Code (LIC) to the programmable tape drive was not completed.</p> <p>The tape drive will continue to operate with the previous LIC. You may do either of the following:</p> <ul style="list-style-type: none"> • Wait for next IPL when the system will attempt to load the LIC for the tape drive again. • Perform "TU-PIP4" on page 505 to reset the IOP and the tape drive. When the IOP is reset, if the device has the wrong level of LIC, the IOP will attempt to load the new LIC. 	ULYWAIT

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
FF09	<p>Licensed Internal Code for tape unit was not upgraded</p> <p>The I/O processor loading of Licensed Internal Code (LIC) to the programmable tape drive was not completed.</p> <p>The tape drive will continue to operate with the previous LIC. You may do either of the following:</p> <ul style="list-style-type: none"> • Wait for next IPL when the system will attempt to load the LIC for the tape drive again. • See the system service documentation to reset the IOP and the tape drive. When the IOP is reset, if the device has the wrong level of LIC, the IOP will attempt to load the new LIC. 	ULYWAIT
FF4D	<p>I/O processor successfully recovered from temporary error</p> <p>No action required. This reference code is logged for information only.</p> <p>When the system is available, display the operator messages, find message CPI946B, and press F14 to run online problem analysis to see if the error threshold has been exceeded.</p>	86G9251 FI00141 EXTSCSI 17G1934 86G9274 86G9255 AJSLOC01
FF5D	<p>I/O processor successfully recovered from temporary error</p> <p>No action required. This reference code is logged for information only.</p> <p>When the system is available, display the operator messages, find message CPI946B, and press F14 to run online problem analysis to see if the error threshold has been exceeded.</p>	86G9251 86G9274 EXTSCSI FI00141 17G1934 86G9255
FFF6	<p>Tape volume statistics logged (no action required)</p> <p>No action required. This reference code is logged for information only.</p>	
FFF8	<p>Asynchronous device attached; synchronous device expected</p> <p>The attached device is operational and working in the asynchronous mode of data transfer. The IBM tape unit uses the synchronous mode of data transfer; if the attached device is an IBM tape unit, exchange the tape unit.</p>	86G9251
FFFE	<p>Tape unit detected a read error on the tape medium</p> <p>Perform the Action for reference code 030B.</p>	MlyTMED 86G9251 86G9274
FFFF	<p>Tape unit detected a write error on tape medium</p> <p>Perform the Action for reference code 030B.</p>	MlyTMED 86G9251

Tape Unit Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.

2. To determine the associated part numbers, go to “Type, Model, and Part Number List” on page 750.
3. To determine the parts associated with symbolic FRUs, such as “ANYBUS”, or “DEVTERM”, go to “Symbolic FRUs” on page 559.

Failing Item	Description	Document Description
17G1934	Terminating plug	Magnetic tape subsystem service information
86G9251	Tape drive	7208 Model 012 5.0GB External 8mm Tape Drive Service Guide
86G9251	Tape drive	Magnetic tape subsystem service information
86G9254	Controller logic card	Magnetic tape subsystem service information
86G9255	Internal signal cable	Magnetic tape subsystem service information
86G9274	Power supply	Magnetic tape subsystem service information
87G1531	Operator Panel/LCD Assembly	Magnetic tape subsystem service information
AJSLC01	I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
EXTSCSI	Cable assembly	Problem Analysis; Symbolic FRU isolation
LIBDEV	Media Library Device	Magnetic tape subsystem service information
MLYTMED	Defective removable media	System operation information
ULYCLN	Tape unit needs cleaning	Magnetic tape subsystem operator’s information
ULYCNFG	Tape configuration detected by I/O processor; not valid	Magnetic tape subsystem operator’s information
ULYUSR1	Operator action required	Magnetic tape subsystem operator’s information
ULYWAIT	Wait to next IPL or perform TU-PIP4	Problem Analysis

(A6xx) LIC Reference Codes

Use “(B6xx) LIC Reference Codes” on page 195.

(B003) Asynchronous Communications Reference Codes

The Asynchronous Communications detected a failure.

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to “Failing Items” on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to “Type, Model, and Part Number List” on page 750 to determine the part number.

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3. If the failing item is a symbolic FRU, go to “Symbolic FRUs” on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
2321	Procedure error in Licensed Internal Code	CNGTEMP
2322	Data-set-ready error on modem interface	CNGTEMP
2340	Data-set-ready changed to not active; for information only	FI00704 CNGTHRS FI00701 FI00719
3200	Clear-to-send state changed; error limit per 256 reached	FI00704 CNGTHRS FI00701 FI00719
3201	Data-set-ready state changed; error limit per 256 reached	FI00704 CNGTHRS FI00701 FI00719
3202	Clear-to-send state changed; error limit per 256 reached	FI00704 CNGTHRS FI00701 FI00719
3203	Carrier-detect state changed; error limit per 256 reached	FI00704 CNGTHRS FI00701 FI00719
3204	Call not completed; error limit per 256 reached	CNGTEL GNLINK FI00705 FI00703
3205	Call completed with error; error limit per 256 reached	CNGTHRS
3206	Data-line-occupied error; error limit per 256 reached	FI00703 CNGTHRS GNLINK FI00702
3207	Abandon-call-retry error; error limit per 256 reached	FI00703 CNGTHRS GNLINK FI00702 CNGTEL
3208	Present-next-digit error; error limit per 256 reached	FI00703 CNGTHRS FI00702 FI00719
3209	Distant-station-connected error; error limit per 256 reached	FI00703 CNGTHRS GNLINK FI00702 CNGTEL
320B	Data-set-ready state changed; error limit per 256 reached	FI00704 CNGTHRS FI00701 FI00719

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
320C	Incorrect number dialed; error limit per 256 reached	CNGTEL CNGTHRS
4200	Break character received; error limit per 256 reached	GNGLINK CNGTHRS
4202	Received storage overrun; error limit per 256 reached	FI00730 CNGTHRS
4203	Incorrect stop bit; error limit per 256 reached	GNGLINK CNGLBPS CNGTHRS
4204	Receive-time-out error; error limit per 256 reached	CNGTHRS GNGLINK
4205	Number of characters discarded; error limit per 256 reached	GNGLINK CNGLBPS CNGLOAD CNGTHRS
4206	Procedure error in Licensed Internal Code	FI00730 AJDG301
4209	Wrong data received; error limit per 256 reached	GNGLINK CNGTHRS
4220	Port already in use	AJDG301 FI00719 CNGSLPT
4240	Port not installed	AJDG301 FI00719 CNGSLPT
4340	Automatic call unit port is not installed	AJDG301 CNGASPT FI00719 FI00702
4376	Automatic call unit already in use	AJDG301 GNGRESC CNGASPT
4502	Wrong configuration value sent by Licensed Internal Code	AJDG301 FI00730
4503	Wrong configuration value sent by Licensed Internal Code	AJDG301 FI00730 CNGDTRT
4504	Wrong configuration value sent by Licensed Internal Code	AJDG301 CNGASPT CNGSLPT
4505 to 4506	Wrong configuration value sent by Licensed Internal Code	AJDG301 CNGASPT FI00730 CNGSLPT
4507	Wrong configuration value sent by Licensed Internal Code	AJDG301 FI00730 CNGSTOP
4508	Wrong configuration value sent by Licensed Internal Code	AJDG301 FI00730

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4509	Wrong configuration value sent by Licensed Internal Code	AJDG301 CNGTMOD FI00730
450A	Wrong configuration value sent by Licensed Internal Code	AJDG301 FI00730 CNGCTYP
450B to 450C	Wrong configuration value sent by Licensed Internal Code	AJDG301 FI00730
450D	Wrong configuration value sent by Licensed Internal Code	CNGPRTY CNGBCHR FI00730 AJDG301
450E	Wrong configuration value sent by Licensed Internal Code	AJDG301 FI00730 CNGMCFL
4549	Wrong configuration value sent by Licensed Internal Code	AJDG301 FI00730
4590	Wrong number specified in controller description	CNGTEL FI00703 FI00701 CNGCLBR FI00719
4592	No number specified in controller description	AJDG301 CNGTEL
4594	Wrong number specified in controller description	CNGTEL FI00730 AJDG301 CNGCLBR
5410	Switched line already in use	FI00704 CNGCMOD FI00701 FI00719
5472	Data-line-occupied error at time of starting	FI00703 GNGRESC FI00719 FI00702
5474	Automatic call unit line connection error	FI00702 FI00703 FI00719 GNGLINK
5476	Present-next-digit error	FI00702 FI00703 FI00719
5501	Wrong configuration value sent by Licensed Internal Code	AJDG301 FI00730
5502	Wrong configuration value sent by Licensed Internal Code	AJDG301 CNGTMOD FI00730
5503	Wrong configuration value sent by Licensed Internal Code	AJDG301 CNGCMOD FI00730

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
5510	Wrong configuration value sent by Licensed Internal Code	AJDG301 CNGECHO FI00730
5511 to 5512	Wrong configuration value sent by Licensed Internal Code	AJDG301 FI00730
5513	Wrong configuration value sent by Licensed Internal Code	AJDG301 CNGEORT FI00730
5514	Wrong configuration value sent by Licensed Internal Code	AJDG301 FI00730
5515	Wrong configuration value sent by Licensed Internal Code	AJDG301 CNGFLOC FI00730
5549	Wrong configuration value sent by Licensed Internal Code	AJDG301 FI00730
5590	Wrong length for number dialed	AJDG301
5630	Automatic call unit distant-station-connected time out	FI00700 GNGLINK CNGRMATA FI00701 FI00719
5632	Automatic call unit had data-set-ready time out	FI00700 CNGTEL FI00703 CNGDRTY CNGRMATA FI00701 FI00719 GNGLINK
5684	Time-out on call-clear-request	FI00704 FI00701 AJDG301 FI00719
5886	Automatic call unit line connection error	FI00704 FI00719 FI00701
5A18	Clear-to-send signal failed to drop on modem interface	FI00704 FI00701 FI00719
5A1C	Clear-to-send signal dropped on modem interface	GNGLINK CNGCTSV FI00704 FI00701 FI00719
5A20	Clear-to-send not active on modem interface	GNGLINK CNGCTSV FI00704 FI00701 FI00719

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
5A24	Carrier-detect dropped on modem interface	FI00701 FI00704 GNGLINK FI00719
5A54	Time-out; data-set-ready did not drop	FI00704 CNGDSRT FI00701 FI00719
5A58	Time-out; data-set-ready not received	FI00701 FI00704 FI00719 AJDG301
5C68	Procedure error in Licensed Internal Code	AJDG301 FI00730
5E00	Wrong or no external communications cable installed	FI00701 CNGASPT CNGSLPT FI00719
5E01	Call received during dialing procedure	GNGRESC FI00704 FI00701 FI00719
6210	Resource or storage not available	CNGMAXI FI00730
6212, 6214	Communications controller error	FI00730 FI00718
6288	Port not operational	FI00719 AJDG301 CNGSLPT
6320	Abandon-call-retry	FI00700 CNGTEL FI00703 FI00719 FI00702
6322	Abandon-call-retry; not all numbers dialed	CNGTEL FI00703 FI00702 FI00719 FI00730
6870	Automatic call unit power turned off	FI00703 FI00702 FI00719
6890	Data-set-ready dropped on modem interface No action is required if Operations Console is attached.	GNGLINK FI00701 FI00704 FI00719
6C05	I/O card Licensed Internal Code error	FI00730 AJDG301
6C0A	Hardware detected failure	FI00719 FI00718
7200	Communications Configuration	CNGSLPT

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
7210	Resource or storage not available	CNGMAXI FI00730
7212	Procedure error in Licensed Internal Code	AJDG301 FI00730
7C00	Asynchronous server program ended abnormally	FI00730
7C02	Wrong command sent by Licensed Internal Code	FI00730
7C03	Resource or storage not available	CNGLOAD FI00730 CNGDTRT CNGECHO CNGEORT CNGPRTY
7C04	Wrong internal routing information	FI00730
7C05, 7C09	Error in I/O card Licensed Internal Code	FI00730
8011	IOP activation failed. Modem Country ID parameter in Network Attributes is not set. Use the CHGNETA command to set MDMCNTRYID value to your country ID.	CNGCONF
8013	IOP activation failed. Modem Country ID parameter in Network Attributes is not valid for this adapter. Use the CHGNETA command to change the MDMCNTRYID value to your country ID.	CNGCONF
8020	System log entry only, no service action required	
FFFF	User suspected communications problem.	UNGUPPR

Asynchronous Communications Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
AJDG301	Licensed Internal Code	Service Functions; APAR or LICTR
CNGASPT	ACRSRCNAME value in CRTLINASC command	Communications Configuration
CNGBCHR	BITSCHAR value in CRTLINASC command	Communications Configuration
CNGCLBR	CALLNBR value in CRTLINASC command	Communications Configuration
CNGCMOD	CNN value in CRTLINASC command	Communications Configuration
CNGCTSV	CTSTMR value in CRTLINASC command	Communications Configuration
CNGCTYP	AUTOANS, AUTODIAL, DIALCMD, SWTCNN, CNN in CRTLINASC	Communications Configuration
CNGDRTY	DIALRTY value in CRTCTLASC command	Communications Configuration
CNGDSRT	DSRDRPTMR value in the CRTLINASC command	Communications Configuration

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Failing Item	Description	Document Description
CNGDTRT	LINESPEED value in CRTLINASC command	Communications Configuration
CNGECHO	ECHO value in CRTLINASC command	Communications Configuration
CNGEORT	EORTBL value in CRTLINASC command	Communications Configuration
CNGFLOC	FLOWCNTL value in CRTLINASC command	Communications Configuration
CNGLBPS	LINESPEED, BITSCHAR, PARITY, STOPBITS values in CRTLINASC	Communications Configuration
CNGLOAD	System processor workload heavy	Communications Configuration
CNGMAXI	MAXBUFFER value in CRTLINASC command	Communications Configuration
CNGMCFL	DUPLEX, CNN, MODEMRATE values in CRTLINASC command	Communications Configuration
CNGPRTY	PARITY value in CRTLINASC command	Communications Configuration
CNGRMTA	RMTANSTMR value in CRTLINASC command	Communications Configuration
CNGSLPT	RSRCNAME value in CRTLINASC command	Communications Configuration
CNGSTOP	STOPBITS value in CRTLINASC command	Communications Configuration
CNGTEL	CNNNBR value in CRTCTLASC command	Communications Configuration
CNGTEMP	No failure found	Communications Configuration
CNGTHRS	THRESHOLD value in CRTLINASC command	Communications Configuration
CNGTMOD	DUPLEX, ECHO, FLOWCNTL value in CRTLINASC command	Communications Configuration
GNGLINK	External devices or network	
GNGRESC	Line or automatic call unit already in use	
UNGUPPR	User suspected communications problem.	

(B006) Common Licensed Internal Code Reference Codes

The common Licensed Internal Code detected a failure.

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1201	I/O processor resource not available A deactivation failed to get a resource controlled by Licensed Internal Code.	AJ EQU00 AJ DG301
1202	Not valid condition in I/O Processor Licensed Internal Code An error in an activation or deactivation occurred.	AJ EQU00 AJ DG301 FI 00131

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1203	I/O processor resource not available A resource needed to perform a requested function is not available in the Licensed Internal Code.	AJ EQU00 AJ DG301
1204	Not valid condition in I/O Processor Licensed Internal Code The Licensed Internal Code has recovered from a condition that was not expected.	AJ EQU00 AJ DG301 FI00131
1205 to 1206	I/O processor card or Licensed Internal Code error A microprocessor exception occurred on the I/O processor.	AJ EQU00 FI00131 FI00132
1207	I/O processor resource not available The Licensed Internal Code could not allocate memory resources on the I/O processor card.	AJ EQU00 AJ DG301
1208	Not valid condition in I/O Processor Licensed Internal Code The Licensed Internal Code found a condition that should not have occurred.	AJ EQU00 AJ DG301 FI00131
1209	I/O processor was not ready for interrupt that occurred	AJ EQU00 FI00131
1210	I/O processor resource not available The I/O processor error log is being filled faster than the errors are being reported to the system. Check other errors reported to the system and correct them.	
1211	System bus error	FI00131 ANYBUS AJ EQU00 AJ DG301
1212	A permanent I/O processor failure occurred	FI00131 AJ EQU00
1213	System bus error	AJ DG301 AJ EQU00 FI00131
1214 to 1215	I/O processor card or Licensed Internal Code error	FI00131 AJ EQU00
1301	I/O processor resource not available An activation or deactivation failed to get a resource controlled by Licensed Internal Code.	CD AWKLD AJ DGP01 AJ DG301
1302	Not valid condition in I/O Processor Licensed Internal Code An error in an activation or deactivation occurred.	AJ DGP01 AJ DG301 FI00131 FI00132
1303	I/O processor resource not available A resource needed to perform a requested function is not available in the Licensed Internal Code.	IO ACNFG AJ DGP01 AJ DG301
1304	Not valid condition in I/O Processor Licensed Internal Code The Licensed Internal Code has recovered from an unexpected condition.	AJ DGP01 AJ DG301 FI00131 FI00132

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1305 to 1306	I/O processor card or Licensed Internal Code error A microprocessor exception occurred on the I/O processor.	AJDGP01 FI00131 FI00132 BACKPLN
1307	I/O processor resource not available The Licensed Internal Code could not allocate memory resources on the I/O processor card.	AJDGP01 AJDG301 IOACNFG FI00132
1308	Not valid condition in I/O Processor Licensed Internal Code The Licensed Internal Code found a condition that should not have occurred.	AJDGP01 AJDG301 FI00131
1309	I/O processor was not ready for interrupt that occurred	AJDGP01 FI00131 FI00132 FI01117
1310	I/O processor resource not available The I/O processor error log is being filled faster than the errors are being reported to the system. Check other errors reported to the system and correct them.	
1311	System bus error	FI00131 ANYBUS AJDGP01 AJDG301
1312	A permanent I/O processor failure occurred	FI00131 AJDGP01
1313	System bus error	AJDG301 AJDGP01 FI00131
1316	I/O processor card or Licensed Internal Code error	AJDGP01 FI00132 FI00131
1403	Service processor Licensed Internal Code error A resource needed to perform a requested function is not available in the Licensed Internal Code.	AJDGP01 SVCPROC
1404	Service processor Licensed Internal Code error The Licensed Internal Code has recovered from an unexpected condition.	AJDGP01 SVCPROC
1405	Service processor Licensed Internal Code error A recoverable microcode condition occurred on the Service processor.	AJDGP01 SVCPROC
1406	Service processor Licensed Internal Code failed A microprocessor exception occurred on the Service processor.	AJDGP01 SVCPROC AJDG301
1407	Service processor Licensed Internal Code failed The Licensed Internal Code could not allocate resources on the Service processor.	AJDGP01 SVCPROC AJDG301
1408	Service processor Licensed Internal Code failed	AJDGP01 AJDG301 SVCPROC

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1409	Service processor Licensed Internal Code failed The Service processor was not ready for an interrupt that occurred.	AJDGP01 SVCPROC
1A01	I/O processor resource not available A deactivation failed to get a resource controlled by Licensed Internal Code.	CDAWKLD FI00130 AJDG301
1A02	Not valid condition in I/O Processor Licensed Internal Code An error in an activation or deactivation occurred.	FI00130 FI00131 FI00132
1A03	I/O processor resource not available A resource that is needed to perform a requested function is not available in the Licensed Internal Code.	FI00130 AJDG301 CDAWKLD
1A04	Recovered from condition in Licensed Internal Code. The Licensed Internal Code has recovered from a condition that was not expected.	FI00130 AJDG301 FI00131 FI00132
1A05 to 1A06	I/O processor card or Licensed Internal Code error A microprocessor exception occurred on the I/O processor.	FI00130 FI00131 FI00132
1A07	I/O processor resource not available The Licensed Internal Code could not allocate memory resources on the I/O processor card.	CDAWKLD FI00132 FI00130 AJDG301
1A08	Not valid condition in I/O Processor Licensed Internal Code The Licensed Internal Code found a condition that should not have occurred.	FI00130 FI00131 FI00132
1A09	Threshold overflow The I/O processor card has detected a threshold of recoverable error conditions. The errors are either wrong interruptions or memory error corrections. If in communications, the line is still running. Note: If a large number of these errors occur during a short time, they may be caused by an electrically noisy environment, a defective communications I/O processor card or modem, or a communications I/O processor code problem.	FI00131 FI00132 FI01117 FI00130
1A10	Error reported to system The I/O processor error log is being filled faster than the errors are being reported to the system. Check other errors reported to the system and correct them.	

Common Licensed Internal Code Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

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Failing Item	Description	Document Description
AJDG301	Licensed Internal Code	Service Functions; APAR or LICTR
AJDGP01	Licensed Internal Code	Service Functions; APAR or LICTR
AJDGP01	I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
AJEQU00	I/O processor Licensed Internal Code	Service Functions; APAR or LICTR
ANYBUS	System bus	Problem Analysis; Symbolic FRU Isolation
BACKPLN	Card enclosure or backplane	Problem Analysis; Symbolic FRU Isolation
CDAWKLD	Too many communications lines in use	
IOACNFG	Configuration error	Problem Analysis; Symbolic FRU Isolation
SVCPROC	Service Processor Card	Problem Analysis; Symbolic FRU Isolation

(B070) Reference Codes

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0000	Device no response time-out; temporary error	FI00601 FI00602 FI00610
0001	<p>WS IOP detected error when transmitting data</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00602 FI00601 GAU7777 GAU8888 FI00610 FI00615
0003	<p>WS IOP detected parity error from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures in "Intermittent Problem Isolation Procedures" on page 313:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00602 FI00601 GAU7777 FI00610

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0004	<p>Device detected parity error from WS IOP</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00602 FI00601 GAU7777 FI00610
0005	<p>WS IOP detected error when transmitting data</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00602 FI00601 GAU8888 FI00610 FI00615
0006	<p>WS IOP detected wrong data from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00601 FI00602 GAU8888 FI00610
0007	<p>WS IOP detected wrong address from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00601 GAU8888 GAU7777 FI00610
0008	<p>WS IOP detected device power turned off, and then on</p> <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	GAUEEEE FI00601
0009	<p>WS IOP detected wrong device response to start command</p> <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00601 FI00610
0020	<p>Device detected wrong command or device ID from WS IOP</p> <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00601 AJLYD01 FI00610
0021	<p>Device detected not valid value from WS IOP</p> <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00601 AJLYD01 FI00610

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0022	Device detected storage or data overrun Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 AJLYD01 FI00610
0023	Device detected null or attribute exception error Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0024	Device detected wrong start command from WS IOP Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 AJLYD01 FI00610
0025	WS IOP detected wrong exception response from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0026	WS IOP detected not valid pass-through command Perform "TWSC-PIP1 (5077)" on page 525.	GAU9999 FI00610
0049	WS IOP detected wrong request or response from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0082	WS IOP detected wrong device type from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601
0090	WS IOP detected no status change from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0091	WS IOP detected busy time-out from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0100	Device no response time-out; temporary error	FI00601 FI00602 FI00610
0101	WS IOP detected error when transmitting data Is the problem intermittent? No Yes ↓ Perform the following procedures: 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 Perform "TWSC-PIP1 (5077)" on page 525.	FI00602 FI00601 GAU7777 GAU8888 FI00610 FI00615
0103	WS IOP detected parity error from device Is the problem intermittent? No Yes ↓ Perform the following procedures: 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 Perform "TWSC-PIP1 (5077)" on page 525.	FI00602 FI00601 GAU7777 FI00610

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0104	<p>Device detected parity error from WS IOP</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00602 FI00601 GAU7777 FI00610
0105	<p>WS IOP detected error when transmitting data</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00602 FI00601 GAU8888 FI00610 FI00615
0106	<p>WS IOP detected wrong data from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00601 FI00602 GAU8888 FI00610
0107	<p>WS IOP detected wrong address from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00601 GAU8888 GAU7777 FI00610
0108	<p>WS IOP detected device power turned off, and then on</p> <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	GAUEEEE FI00601
0109	<p>WS IOP detected wrong device response to start command</p> <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00601 FI00610
0111	<p>WS IOP detected wrong keyboard scan code from display</p> <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00601 AJLYD01 FI00610
0120	<p>Device detected wrong command or device ID from WS IOP</p> <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00601 AJLYD01 FI00610

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0121	Device detected not valid value from WS IOP Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 AJLYD01 FI00610
0122	Device detected storage or data overrun Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 AJLYD01 FI00610
0123	Device detected null or attribute exception error Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0124	Device detected wrong start command from WS IOP Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 AJLYD01 FI00610
0125	WS IOP detected wrong exception response from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0126	WS IOP detected not valid pass-through command Perform "TWSC-PIP1 (5077)" on page 525.	GAU9999 FI00610
0149	WS IOP detected wrong request or response from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0170	WS IOP detected error downloading printer definition table	AJDG301 FI00601
0171	WS IOP detected error downloading printer definition table	FI00601 AJLYD01
0172	WS IOP detected error downloading printer definition table	CAUPDT AJDG301 FI00601
0173	WS IOP detected error downloading printer definition table	CAUPDT FI00601
0174	WS IOP detected error unloading printer definition table	FI00601 AJLYD01
0175	WS IOP detected device configuration error	FI00601 AJLYD01
0176 to 0177	WS IOP detected error downloading LIC to device	GAUDMCC FI00601
0181	Wrong magnetic stripe reader response Perform "TWSC-PIP1 (5077)" on page 525.	FI00605 MAUFFFF FI00601 FI00610
0182	WS IOP detected wrong device type from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601
0183	WS IOP detected wrong display size value Perform "TWSC-PIP1 (5077)" on page 525.	FI00601
0184	WS IOP detected wrong keyboard identification Verify that the correct keyboard is attached correctly to the workstation. If the correct keyboard is attached correctly to the workstation, perform "TWSC-PIP1 (5077)" on page 525.	FI00601

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0189	Wrong magnetic stripe reader or light pen status Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00605 FI00607 FI00610
0190	WS IOP detected no status change from device Is the problem intermittent? No Yes ↓ Perform the following procedures: 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610 GAU7777
0191	WS IOP detected busy time-out from device Perform "TWSC-PIP1 (5077)" on page 525.	FI00601 FI00610
0200	Device no response time-out; temporary error	FI00604 FI00602 FI00610
0201	WS IOP detected error when transmitting data Is the problem intermittent? No Yes ↓ Perform the following procedures: 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 Perform "TWSC-PIP1 (5077)" on page 525.	FI00602 FI00604 GAU7777 GAU8888 FI00610 FI00615
0203	WS IOP detected parity error from device Is the problem intermittent? No Yes ↓ Perform the following procedures: 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 Perform "TWSC-PIP1 (5077)" on page 525.	FI00602 FI00604 GAU7777 FI00610
0204	Device detected parity error from WS IOP Is the problem intermittent? No Yes ↓ Perform the following procedures: 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 Perform "TWSC-PIP1 (5077)" on page 525.	FI00602 FI00604 GAU7777 FI00610

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0205	<p>WS IOP detected error when transmitting data</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	<p>FI00602 FI00604 GAU7777 FI00610 FI00615</p>
0206	<p>WS IOP detected wrong data from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	<p>FI00604 FI00602 GAU8888 FI00610</p>
0207	<p>WS IOP detected wrong address from device</p> <p>Is the problem intermittent?</p> <p>No Yes</p> <p>↓ Perform the following procedures:</p> <ol style="list-style-type: none"> 1. "INT-PIP5 External Noise on Twinaxial Cables" on page 314 2. "INT-PIP14 Station Protectors" on page 320 <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	<p>FI00604 GAU8888 GAU7777 FI00610</p>
0208	<p>WS IOP detected device power turned off, and then on</p>	<p>GAUEEEE FI00604</p>
0209	<p>WS IOP detected wrong device response to start command</p>	<p>FI00604 FI00610</p>
0210	<p>Printer detected equipment error</p>	<p>FI00604</p>
0211	<p>Printer detected equipment error</p>	<p>FI00604 AJLYD01 FI00610</p>
0212	<p>Printer detected equipment error</p>	<p>FI00604</p>
0220	<p>Device detected wrong command or device ID from WS IOP</p>	<p>FI00604 AJLYD01 FI00610</p>
0221	<p>Device detected not valid value from WS IOP</p>	<p>FI00604 AJLYD01 FI00610</p>
0222	<p>Device detected storage or data overrun</p>	<p>FI00604 AJLYD01 FI00610</p>
0223	<p>WS IOP detected start command to printer was lost</p>	<p>FI00604 FI00602 FI00610</p>

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0224	Device detected wrong start command from WS IOP	FI00604 AJLYD01 FI00610
0225	WS IOP detected wrong exception response from device	FI00604 FI00610
0230 to 0239, 0240 to 0248	Printer detected equipment error	FI00604
0249	WS IOP detected wrong request or response from device	FI00604 FI00610
0290	WS IOP detected no status change from device	FI00604 FI00610
0291	WS IOP detected busy time-out from device	FI00604 FI00610
A000	<p>Too many devices active on the workstation IOP</p> <p>This error occurs if you attempted to activate more workstations than allowed.</p> <p>Switch off power to (or remove) one or more of the display stations (except for the console) that are attached to this workstation I/O processor. Perform an initial program load (IPL) from the control panel to correct the problem.</p> <p>Refer to the local workstation diagrams for the location of workstations if necessary.</p>	GAUBBBB
B000	<p>WS IOP fails to report part, model and serial number</p> <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00610
C000	WS IOP error not known	AJLYD01 FI00610
D000	Work Station IOA start-up test error	FI00610
D010	<p>WS IOP storage failure corrected</p> <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00610
D011	WS IOP card storage failure	FI00610
D021	WS IOP detected errors on all cables	FI00602 FI00601 FI00610 FI00615
D022	WS IOP parity errors detected on all cables	FI00602 FI00601 FI00610 FI00615
D023	<p>WS IOP detected errors on some, but not all cables</p> <p>Perform "TWSC-PIP1 (5077)" on page 525.</p>	FI00602 FI00601 FI00610
E000	WS IOP or IOA error during working operation	AJLYD01 FI00610
F000	WS IOP or IOA operating system program error	AJLYD01

Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
AJDC301	Licensed program	Service Functions; APAR or LICTR
AJDGP01	Licensed Internal Code	Service Functions; APAR or LICTR
AJLYD01	Work Station IOP or IOA system Licensed Internal Code	Service Functions; APAR or LICTR
CAUPDT	Printer definition table	Communications Configuration
GAU7777	Electrical interference	
GAU8888	Other work station on port is failing	
GAU9999	Error occurred with pass-through command	
GAUBBBB	Too many work stations are active on the workstation IOP	
GAUDMCC	Device Licensed Internal Code change	
GAUEEEE	Active device turned off	
MAUFFFF	Magnetic stripe	Refer to I/O device service information
UAUFF00	User believes there is a problem	

(B075) Workstation Adapter Console Reference Codes

The workstation adapter console detected a failure.

1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0101	WS IOP detected error when transmitting data Perform "WSAC-PIP1" on page 537.	FI00601 GXC7777 FI00631 FI00730
0103	WS IOP detected parity error from device Perform "WSAC-PIP1" on page 537.	FI00601 GXC7777 FI00631 FI00730

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0104	Device detected parity error from WS IOP Perform "WSAC-PIP1" on page 537.	FI00601 GXC7777 FI00631 FI00730
0105	WS IOP detected error when transmitting data Perform "WSAC-PIP1" on page 537.	FI00601 GXC7777 FI00631 FI00730
0106	WS IOP detected wrong data from device Perform "WSAC-PIP1" on page 537.	FI00601 FI00631 GXC7777 FI00730
0107	WS IOP detected wrong address from device Perform "WSAC-PIP1" on page 537.	FI00601 GXC7777 FI00730
0108	WS IOP detected device power turned off, and then on Perform "WSAC-PIP1" on page 537.	GXCEEEE FI00601
0109	WS IOP detected wrong device response to start command Perform "WSAC-PIP1" on page 537.	FI00601 FI00615
0111	WS IOP detected wrong keyboard scan code from display Perform "WSAC-PIP1" on page 537.	FI00601 FI00730
0120	Device detected wrong command or device ID from WS IOP Perform "WSAC-PIP1" on page 537.	FI00601 FI00730
0121	Device detected not valid value from WS IOP Perform "WSAC-PIP1" on page 537.	FI00601 FI00730
0122	Device detected storage or data overrun Perform "WSAC-PIP1" on page 537.	FI00601 FI00730
0123	Device detected null or attribute exception error Perform "WSAC-PIP1" on page 537.	FI00601 FI00730
0124	Device detected wrong start command from WS IOP Perform "WSAC-PIP1" on page 537.	FI00601 FI00730
0125	WS IOP detected wrong exception response from device Perform "WSAC-PIP1" on page 537.	FI00601 FI00730
0126	WS IOP detected not valid pass-through command Perform "WSAC-PIP1" on page 537.	GXC9999 FI00730
0149	WS IOP detected wrong request or response from device Perform "WSAC-PIP1" on page 537.	FI00601 FI00730
0190	WS IOP detected no status change from device Perform "WSAC-PIP1" on page 537.	FI00601 GXC7777 FI00730
0191	WS IOP detected busy time-out from device Perform "WSAC-PIP1" on page 537.	FI00601 FI00730

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0201	WS IOP detected error when transmitting data Perform "WSAC-PIP1" on page 537.	FI00604 GXC7777 FI00631 FI00730
0203	WS IOP detected parity error from device Perform "WSAC-PIP1" on page 537.	FI00604 GXC7777 FI00631 FI00730
0204	Device detected parity error from WS IOP Perform "WSAC-PIP1" on page 537.	FI00604 GXC7777 FI00631 FI00730
0205	WS IOP detected error when transmitting data Perform "WSAC-PIP1" on page 537.	FI00604 GXC7777 FI00631 FI00730
0206	WS IOP detected wrong data from device Perform "WSAC-PIP1" on page 537.	FI00604 FI00631 FI00730
0207	WS IOP detected wrong address from device Perform "WSAC-PIP1" on page 537.	FI00604 GXC7777 FI00730
0208	WS IOP detected device power turned off, and then on	GXC7777 FI00604
0209	WS IOP detected wrong device response to start command	FI00604 FI00730
0211	Printer detected equipment error	FI00604 FI00730
0221	Device detected not valid value from WS IOP	FI00604 FI00730
0224	Device detected wrong start command from WS IOP	FI00604 FI00730
0225	WS IOP detected wrong exception response from device	FI00604 FI00730
0290	WS IOP detected no status change from device	FI00604 FI00730
0291	WS IOP detected busy time-out from device	FI00604 FI00730
5000	Wrong command sent by Licensed Internal Code	AJDG301
5001	Procedure error in Licensed Internal Code	AJDG301
5002	Procedure error in Licensed Internal Code Procedure error in machine instructions	CXCTEMP AJDG301
5006	Procedure error in Licensed Internal Code	AJDG301
5007	Procedure error in Licensed Internal Code	AJDG301 CXCMTA
5009	Incorrect command value sent by Licensed Internal Code	AJDG301
500A	Procedure error in Licensed Internal Code	AJDG301

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
500D	Incorrect command value sent by Licensed Internal Code	AJDG301 CXCMAXI
5022	Procedure error in Licensed Internal Code	AJDG301
5206	Communications controller storage not available	CXCBUSY
56EA	Clear-to-send signal dropped on modem interface	GXCLINK FI00704 CXCCTSV FI00719 FI00701
56ED	Data-set-ready turn-on time-out on modem interface	FI00701 FI00704 FI00719 AJLAG01
56F1	Data-set-ready dropped on modem interface	FI00704 FI00701 GXCLINK FI00719
5710	Nonproductive receive time-out while receiving from remote	CXCNPRT FI00700 FI00705 FI00704 GXCLINK FI00701 FI00719
5712	No data received from remote equipment; time-out	AJLAG01 CXCENCD CXCINAT GXCLINK FI00704 FI00705 FI00700 CXCSTAD FI00701 CXCDTAR FI00719 CXCMRTY
5715	Remote equipment did not respond causing an idle-time-out	GXCLINK CXCRPTO FI00701 FI00704 CXCMRTY FI00705 CXCENCD FI00700 CXCDTAR FI00719
5718	Retry limit reached for sending frames to remote equipment	GXCLINK FI00705 FI00704 FI00700 CXCMRTY FI00719 FI00701
5719	Retry limit reached for sending frames to remote equipment	FI00700

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
5720	Retry limit reached for sending poll frame to remote	FI00700 CXCMODU
5721	Could not send frame to remote equipment; local problem	FI00704 CXCDTAR FI00701 FI00719 FI00730
5722	Wrong command value sent by OS/400 licensed program	AJLAG01 CXCSTAD
A000	Too many devices active on the workstation IOP	GXCBBBB
B000	WS IOP fails to report part, model and serial number Perform "WSAC-PIP1" on page 537.	FI00615
C000, D000	WS IOP error not known	AJLAG01
D001	Wrong or no external communications cable installed	FI00631 AJLAG01
F003	WS IOA buffer utilization threshold exceeded temporarily	AJLAG01
FFFF	User believes there is a problem Reference code FFFF is assigned by the ANZPRB (Analyze Problems) for user-detected errors. Run ANZPRB again if the problem still exists or look in the problem log (WRKPRB) for possible failing FRUs.	UXCFF00

Workstation Adapter Console Failing Items

Notes:

1. To determine the failing items, go to "Failing Items" on page 539.
2. To determine the associated part numbers, go to "Type, Model, and Part Number List" on page 750.
3. To determine the parts associated with symbolic FRUs, such as "ANYBUS", or "DEVTERM", go to "Symbolic FRUs" on page 559.

Failing Item	Description	Document Description
AJDG301	Licensed Internal Code	Service Functions; APAR or LICTR
AJLAG01	I/O adapter Licensed Internal Code	Service Functions; APAR or LICTR
CXCBUSY	Too many communications lines in use	Communications Configuration
CXCCONF	Configuration or OS/400 licensed program	Communications Configuration
CXCCPTO	CNNPOLLTMR value in CRTLNSDLC command	Communications Configuration
CXCCTSV	CTSTMR value in CRTLNSDLC command	Communications Configuration
CXCDTAR	LINESPEED value in CRTLNSDLC command	Communications Configuration
CXCENCD	NRZI value in CRTLNSDLC command	Communications Configuration
CXCINAT	INACTTMR value in CRTLNSDLC command	Communications Configuration
CXCMAXI	MAXFRAME value in CRTLNSDLC command	Communications Configuration
CXCMODU	MODULUS value in CRTLNSDLC command	Communications Configuration
CXCMRTY	FRAMERTY value in CRTLNSDLC command	Communications Configuration
CXCMSTA	MAXCTL value in CRTLNSDLC command	Communications Configuration

Failing Item	Description	Document Description
CXCNPRT	NPRDRCVTMR value in CRTLINS DLC command	Communications Configuration
CXCRPTO	IDL TMR value in CRTLINS DLC command	Communications Configuration
CXC S NDT	SHMNODE value in CRTLINS DLC command	Communications Configuration
CXCSTAD	STNADR value in CRTCTL ____ command	Communications Configuration
CXCTEMP	No failure found	Communications Configuration
GXC7777	Electrical interference	
GXC8888	Other work station on port is failing	
GXC9999	Error occurred with pass-through command	
GXCBBBB	Too many work stations are active on the workstation IOP	
GXC E E E E	Active device turned off	
GXC LINK	Communications network equipment	
UXCFF00	User believes there is a problem	

(B2xx) Logical Partition Reference Codes

The code that logically partitions the system detected an error in the logical partition. These reference codes are posted in the *Partition Status* screens under the SST/DST "Work with system partitions" option.

1. Characters 3 and 4 of word 1 are the partition ID of the logical partition with the problem.
2. Find the unit reference code in the following table.

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1210	<p>A problem occurred during the IPL of a secondary partition</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>Look in the Primary partition's Service Action Log for a B6005090 during the secondary partition IPL. Use that SRC and go to "Chapter 2. Unit Reference Codes" on page 17.</p> <p>If you do not find a B6005090 in the Service Action Log of the Primary partition then look for any SRC which was logged during the IPL of the Primary partition. Search the Service Action Log first and if you do not find an SRC there then search the Product Activity Log. Use the new SRC and go to "Chapter 2. Unit Reference Codes" on page 17.</p>	FI00580
1220	<p>A problem occurred during the IPL of a secondary partition</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>Initiate a Primary partition main storage dump then contact your next level of support.</p>	FI00099

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1230	<p>A problem occurred during the IPL of a secondary partition</p> <p>See the <i>AS/400 Service Functions</i> information.</p> <p>This is a partitioning configuration problem. The partition is lacking the necessary resources to IPL. Refer the customer to their software support.</p>	FI00099 LPARCFG
1250	<p>A problem occurred during the IPL of a secondary partition</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>The primary partition's IPL mode does not allow the secondary partition to IPL in the mode the secondary partition attempted to IPL in. If the primary partition is IPL'd in 'C' mode then secondary partitions can only IPL in 'C' mode. Other modes are not allowed.</p> <p>IPL the primary partition in either 'A' mode or 'B'. Then retry the IPL of the secondary partition.</p>	LPARCFG
1310	<p>A problem occurred during the IPL of a secondary partition</p> <p>No alternate (D-mode) IPL IOP selected. The IPL will attempt to continue, but there may not be enough information to find the correct D-mode loadsource.</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>Have the customer configure an alternate IPL IOP for the secondary partition. Then retry the secondary partition IPL.</p>	LPARCFG
1320	<p>A problem occurred during the IPL of a secondary partition</p> <p>No default load source IOP selected for an A/B-mode IPL. The IPL will attempt to continue, but there may not be enough information to find the correct load-source.</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>Have the customer configure a loadsource IOP for the secondary partition. Then retry the secondary partition IPL.</p>	LPARCFG
3110	<p>A problem occurred during the IPL of a secondary partition</p> <p>Contact your next level of support.</p>	LPARSUP
3113	<p>A problem occurred during the IPL of a secondary partition</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>Look in the Service Action Log of the Primary partition for B600xxxx SRCs that were logged when the secondary partition was IPLing. Correct the B600xxxx problem, then retry the secondary partition IPL.</p> <p>If there are no B600xxxx SRCs in the Service Action Log of the Primary partition from the secondary partition's IPL then contact your next level of support.</p>	LPARSUP

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3114	<p>A problem occurred during the IPL of a secondary partition</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>Look in the Service Action Log of the Primary partition for B600xxxx SRCs with the same bus/board/card numbers identified in the B2xx xxxx SRC words. Use the new SRC and go to “Chapter 2. Unit Reference Codes” on page 17.</p> <p>The B2xx xxxx SRC Format is Word 1: B2xx3114, Word 3: Bus, Word 4: Board, Word 5: Card.</p>	FI00096
3120	<p>A problem occurred during the IPL of a secondary partition</p> <p>Retry count exceeded. Contact your next level of support.</p>	LPARSUP
3123	<p>A problem occurred during the IPL of a secondary partition</p> <p>Due to the multi-adapter bridge configuration the IOA with the load source device for the secondary partition does not belong to the IOP it was assigned to when the secondary partition was configured.</p> <p>Contact your next level of support.</p>	LPARSUP
3125	<p>A problem occurred during the IPL of a secondary partition</p> <p>Read and understand the information on logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>Primary partition main store utilization problem. The Primary partition code could not obtain a segment of main storage within the Primary partition’s main store to use for managing the creation of a secondary partition.</p>	LPARCFG
3128	<p>A problem occurred during the IPL of a secondary partition</p> <p>An unexpected failure return code was returned when attempting to query the IOA slots that are assigned to an IOP.</p>	FI00099
3130	<p>A problem occurred during the IPL of a secondary partition</p> <p>If word 3 is zero, then this SRC is informational and can be ignored.</p> <p>Otherwise there is a problem in the Primary partition. A non-zero bus number has no associated bus object.</p> <p>Contact your next level of support.</p>	LPARSUP
3135	<p>A problem occurred during the IPL of a secondary partition</p> <p>An unknown bus type was detected.</p>	FI00099
3140	<p>A problem occurred during the IPL of a secondary partition</p> <p>The load-source IOP is not owned by the secondary partition. This is a configuration problem in the secondary partition. Have the customer re-configure the partition to have the intended load-source IOP.</p> <p>If there is not a configuration problem then contact your next level of support.</p>	LPARSUP

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
3200	<p>A problem occurred during the IPL of a secondary partition</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>Look for an SRC in the Service Action Log of the Primary partition logged at the time the secondary partition was IPLing. Use the new SRC and go to "Chapter 2. Unit Reference Codes" on page 17.</p>	<p>FI00098</p> <p>FI00096</p>
4310	<p>A problem occurred during the IPL of a secondary partition</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>Initiate a Primary partition main storage dump and contact your next level of support.</p>	FI00099
4311	<p>A problem occurred during the IPL of a secondary partition</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>Initiate a primary partition main storage dump and contact your next level of support.</p>	FI00099
4312	<p>A problem occurred during the IPL of a secondary partition</p> <p>Received an unexpected Direct Select Address.</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>Initiate a Primary partition main storage dump and contact your next level of support.</p>	FI00099
4320	<p>A problem occurred during the IPL of a secondary partition</p> <p>Configuration error. Expected a disk unit and got some other kind of adapter or device.</p> <p>See the <i>AS/400 Service Functions</i> information.</p>	LPARSUP
4321	<p>A problem occurred during the IPL of a secondary partition</p> <p>Configuration error. Expected a tape or optical unit and received some other kind of adapter or device.</p> <p>See the <i>AS/400 Service Functions</i> information.</p>	LPARSUP
5106	<p>Problem detected during main storage dump</p> <p>Not enough space in the Primary partition's ASP to contain the dump.</p> <p>Contact your next level of support.</p>	LPARSUP
5114	<p>Problem detected during main storage dump</p> <p>There is not enough space on the secondary partition's load-source to contain the dump.</p>	FI00099
5115	<p>Problem detected during main storage dump</p> <p>There was an error reading the secondary partition's main storage dump from the secondary partition's load-source into the Primary partition's main storage.</p>	LPARSUP

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
5117	<p>Problem detected during main storage dump</p> <p>A main storage dump has occurred but cannot be written to the load source device because a valid dump already exists.</p> <p>Contact your next level of support.</p>	LPARSUP
5121, 5135, 5145	<p>Problem detected during main storage dump</p> <p>There was an error writing the secondary partition's main storage dump to the secondary partition's load-source.</p>	LPARSUP
5148	<p>Problem detected during main storage dump</p> <p>An error occurred while doing a main storage dump that would have caused another main storage dump.</p> <p>Contact your next level of support.</p>	LPARSUP
6012	<p>A problem occurred during the IPL of a secondary partition</p> <p>The secondary partition's LID failed to completely load into the the partition's mainstore area.</p> <p>Contact your next level of support.</p>	LPARSUP
6015	<p>A problem occurred during the IPL of a secondary partition</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>The load-source media is corrupted or invalid. A SLIP install of the secondary partition is required to recover.</p>	MEDIA FI00099
6025	<p>A problem occurred during the IPL of a secondary partition</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>This is a problem with the load-source media being corrupt or invalid. A SLIP install of the secondary partition is required to recover.</p>	MEDIA FI00099
6027	<p>A problem occurred during the IPL of a secondary partition</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>A failure occurred when allocating memory for an internal object used for LID load operations.</p>	LPARCFG
6110	<p>A problem occurred during the IPL of a secondary partition</p> <p>Error on load-source device.</p> <p>See the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>Record the SRC. The Direct Select Address of the device IOP in the SRC. Word 3: Bus, Word 4: Board, Word 5: Card.</p>	FI00098

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
7111	<p>A problem occurred during the IPL of a secondary partition</p> <p>Load-source device driver does not point to an IOP hardware driver.</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>Initiate a Primary partition main storage dump, and contact your next level of support.</p>	FI00099
7115	<p>A problem occurred during the IPL of a secondary partition</p> <p>The IOP identified in word 5 is not reporting to the secondary partition. Removing an IOP hardware driver (not the loadsource for the current IPL) from the Primary partition failed. The IPL will continue, but the secondary partition will not be able to establish connections to this IOP.</p> <p>Word 3: Bus, Word 4: Board, Word 5: Card.</p>	FI00099 LPARSUP
7117	<p>A problem occurred during the IPL of a secondary partition</p> <p>The IOP identified in word 5 is not reporting to the secondary partition. Removing the IOP hardware driver that is associated with the current load-source has failed. The IPL will fail.</p> <p>Read and understand the information about logical partitions. See the <i>AS/400 Service Functions</i> information.</p> <p>Record the SRC. The location of the IOP is in SRC words 3, 4 and 5. Word 3: Bus, Word 4: Board, Word 5: Card.</p>	FI00099 LPARSUP
8105	<p>A problem occurred during the IPL of a secondary partition</p> <p>There was a failure loading the VPD areas of the secondary partition. The load-source media has been corrupted. A SLIP install of the partition is required.</p>	MEDIA FI00099
8107	<p>A problem occurred during the IPL of a secondary partition</p> <p>There was a problem getting a segment of main storage in the Primary partition's main store.</p>	FI00099
8115	<p>A problem occurred during the IPL of a secondary partition</p> <p>There was a low level partition to partition communication failure. A secondary partition re-IPL is necessary to recover.</p> <p>If this SRC appears again when the partition is re-IPLed contact your next level of support.</p>	LPARSUP
F000	<p>A problem occurred during the IPL of a secondary partition</p> <p>An operation has timed out. Look in the Service Action Log of the Primary partition for a failure during the last IPL of the secondary partition. Use the new SRC and go to "Chapter 2. Unit Reference Codes" on page 17. If you do not find a failure in the Service Action Log from the last IPL of the partition then record all words of this SRC and call your next level of support. See the <i>AS/400 Service Functions</i> information.</p>	LPARSUP
F001	<p>A problem occurred during the IPL of a secondary partition</p> <p>A bus time out occurred on a command to the loadsource IOP.</p>	FI00098 FI00096

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
F002	A problem occurred during the IPL of a secondary partition Timeout waiting for the load source hardware driver. Initiate a main store dump of secondary partition.	LPARSUP
F003	A problem occurred during the IPL of a secondary partition Partition processors did not start LIC within the timeout window.	FI00099
F004 to F005	A problem occurred during power off of secondary partition. From the "Work with partition status screen" the primary partition issued a power down message to the secondary partition but the message response from the secondary timed out. Initiate a main store dump of the secondary partition.	FI00099
F006	A problem occurred during the IPL of a secondary partition The LID load operation for the secondary partition's IPL timed out.	FI00098 FI00096

(B2xx) Logical Partition Failing Items

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Failing Item	Description	Document Description
LPARCFG	Configuration error	Problem Analysis; Symbolic FRU Isolation
LPARSUP	Call your next level of support for assistance	Problem Analysis; Symbolic FRU Isolation
MEDIA	Attached storage device	Problem Analysis; Symbolic FRU Isolation

(B6xx) LIC Reference Codes

Perform the following:

1. Find the SRC in the *SRC* column of the following table.
2. Perform the actions in the *What You Should Do* column of the table.

SRC	What You Should Do
11 A6xx xxxx	Licensed Internal Code intervention is needed. 1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code. 2. See the table below and find the unit reference code.

B6xx (including A6xx)

SRC	What You Should Do
11 B6xx xxxx	<p>The Licensed Internal Code detected a failure.</p> <ol style="list-style-type: none"> 1. Look at the 4 rightmost characters of the Data display for word 1. These 4 characters are the unit reference code. 2. See the table below and find the unit reference code. 3. When working with the Product Activity Log, system LIC entries often occur as a secondary effect of other hardware related entries. The following list is a suggested method of isolating these kinds of problems. <ol style="list-style-type: none"> a. Examine the date and time of the informational reference codes. b. Determine if any other reference codes were logged at or before the same date and time. c. Start the service approach based on these other logged errors.

Notes:

1. If the failing item is a failing item (FI) code, go to "Failing Items" on page 539 to determine which part number associated with the FI code is failing.
2. If the failing item is a type number, go to "Type, Model, and Part Number List" on page 750 to determine the part number.
3. If the failing item is a symbolic FRU, go to "Symbolic FRUs" on page 559 to determine the part number.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
0000	<p>Operating system status code</p> <p>This reference code is for information only. It is shown in the Product activity log as a side effect of a condition that was detected by LIC.</p> <p>Normally, no action should be taken as a result of information reference codes. However, to isolate the root cause, use these suggestions:</p> <ol style="list-style-type: none"> 1. Examine the date and time of the informational reference code. 2. Determine if any other reference codes have been logged at or before the same date and time. 3. Begin the service approach based on these other logged errors. 		
0102	<p>A machine check occurred during IPL</p> <p>Words 2 to 9 of this SRC contain additional diagnostic information. Record SRC words 1 through 9 before attempting to IPL again and report the problem to your Software Service Provider.</p>		
0103	<p>Main storage dump must be copied for service.</p> <p>Perform "LIC-PIP1" on page 323.</p>		
0104	<p>Terminate Immediate reference code is bad</p> <p>Perform "LIC-PIP8 (5077)" on page 336.</p>	AJDG301	

B6xx (including A6xx)

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
0105	More than one request to terminate the system was issued Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0106	Terminate Immediate data is not valid Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0202	Unrecoverable read error Restore the Licensed Internal Code using "Licensed Internal Code Install and Restore" in the <i>AS/400 Service Functions</i> information.		
0244, 0255, 0266	Contact was lost with the device indicated Do not power off the system. Perform "LIC-PIP13 (5077)" on page 357.	FI00580 FI00500 FI00302 FI00301 AJDG301	
0277	A compression disk unit cannot complete an operation. Note: Do not power off the system when performing this procedure. Look at the 4 leftmost characters of the Data display for word 7. These four characters indicate the type of problem that exists and the recovery action to perform. If these characters are 8402 or 2002, the compression disk unit is temporarily full of data. The command to the compression disk is being held. When the storage subsystem controller has created sufficient space on the compression disk unit to contain the data, the command which is being held will be released and the system will resume normal processing. If the system does not resume normal processing within 20 minutes, contact your next level of support. If these characters are 8400 or 2000, the compression disk unit is full of data. The command to the compression disk is being held. Ask the customer to perform the recovery actions in the "Disk Unit Full Considerations" section of the Backup and Recovery Guide, SC41-5304.		
0302	Recursion in exception handler Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0304	Component specific exception handler return code not valid Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0305	Exception while storage management lock is held Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0308	LIC exception code detected a problem Component Specific Exception Handler recursion is detected in an OS/400 process. Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
0317	Traceback for code not found Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0323 to 0329	LIC exception code detected a problem Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0333	A branch to a bad address was attempted Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0334	Exception Handler could not be removed Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0335	Code resumed to not valid address following exception Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0401	A machine check occurred during IPL Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0402	A machine check occurred during authority initialization Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0403	Unhandled exception during IPL or install Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0405	Unhandled exception in authority recovery Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0406	Unhandled exception in data base recovery Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0407	Unhandled exception in data base initialization Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0408	Unhandled exception in journal recovery Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0409	Unhandled exception in journal synchronization Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0410	Unhandled exception in journal clean up Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0411	Unhandled exception in commit recovery Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0412	Unhandled exception in commit initialization Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0413	Rebuild of recovery object index failed Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
0414	Install of operating system failed on read from media Perform "LIC-PIP8 (5077)" on page 336.	FI00300	
0415	Create user profile failed Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0417	Initiating the initial process failed Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0418 to 0419, 0420	The information loaded from the install media is not valid Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0421	Bad return code creating a queue or message Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0422	The Load/Dump command failed Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0439	Opening the IPCF connection failed Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0440	Termination code is not valid Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0441	Power off system command failed Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0443	Programmed IPL command failure Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0446	Error during machine termination Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0447	Failure to reach MI boundary Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0449	Exception in MI boundary manager Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0506	Attempt to destroy a task with critical flag on Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0607	Maximum stack size exceeded in process or task Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
0620	Event management index is not usable Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
0650	<p>Resource management segment could not be created or extended</p> <p>A main store dump was initiated.</p> <p>Words 2 to 9 of this SRC contain additional diagnostic information. Record SRC words 1 through 9.</p> <p>Perform a system IPL and collect the Product activity log and mainstore dump and provide them along with the recorded SRC information to IBM Service Support.</p> <p>The problem may also be that there is not enough auxiliary storage.</p>	AJDG301	
0801	<p>Invalid LID directory detected</p> <p>During system IPL, the LIDMgr detected an I/O failure or media failure while trying to read the LID directory.</p> <p>Perform "LIC-PIP8 (5077)" on page 336.</p>	FI00070 FI00300 AJDG301	
0802	<p>LID directory unusable</p> <p>During system IPL, the LIDMgr detected that the LID directory and associated load source is not usable.</p> <p>Reinstall the Licensed Internal Code using "Licensed Internal Code Install and Restore" in the <i>AS/400 Service Functions</i> information.</p> <p>For more information, contact IBM Service Support.</p>	AJDG301	
0901	<p>The LinkLoader has found its bad flag ON</p> <p>This reference code is usually the result of a system termination while the LinkLoader is performing its work.</p> <p>Reinstall the Licensed Internal Code using "Licensed Internal Code Install and Restore" in the <i>AS/400 Service Functions</i> information.</p>		
0902	<p>Unable to perform programmed IPL</p> <p>The LinkLoader was not successful in performing a programmed IPL.</p> <p>Perform a system IPL. If the problem persists, examine the main storage dump and determine the reason for the failure of the programmed IPL.</p>		
1001	<p>Enqueueing a task to the TDQ which is already enqueued on TDQ</p> <p>Perform "LIC-PIP8 (5077)" on page 336.</p>	AJDG301	
1103	<p>MISR not readable; must be readable for Normal Mode install</p> <p>MISR is not readable. Perform a manual install to reinitialize the system.</p>		

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
1104	Failure reading media or not install media Determine that correct install media is loaded. If correct install media is installed, media could be corrupt. Obtain another copy of the install media and reattempt the install. If the install still fails, contact your service representative.		
1201	Critical database segment could not be created Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
1204	Error in constraint enforcement Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
1210	Object not found in the in-use table Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
1215	Error in critical code sequence Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
1219	A back leveled driver has been detected Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
1604	Not able to create APPN task An error occurred during task creation which requires a power off of the system. Perform "LIC-PIP8 (5077)" on page 336.	AJDG301	
1724	An attempt to create a segment failed The create could fail for two reasons: <ul style="list-style-type: none"> • A code problem Perform "LIC-PIP8 (5077)" on page 336. • No free auxiliary storage on the system Add additional DASD if the create failed because no auxiliary storage was available. 	AJDG301	
1730	An IPL is needed to restore system performance Licensed Internal Code has detected a condition that is impacting system performance. System operation can continue, but system performance may be noticeably reduced until the next IPL. For more information, contact IBM Service Support.	GG3PL01	
3000	Logical partition service function Main Storage Dump. Copy the current main storage dump to media. For more information on how to copy a Main Storage Dump, refer to the AS/400 Service Functions Information (see "Copying a Main Storage Dump" under "Working with Storage Dumps").	AJDG301	

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
4402	<p>Missing DASD units.</p> <p>Copy the current main storage dump to media. Then exit the Main Storage Dump Manager.</p> <p>For more information on how to perform a Main Storage Dump, refer to AS/400 Service Functions information (see "Copying a Main Storage Dump" under "Working with Storage Dumps").</p>		
4403	<p>Storage Management failed to reach full paging.</p> <p>Copy the current main storage dump to media.</p> <p>For more information on how to perform a Main Storage Dump, refer to AS/400 Service Functions information (see "Copying a Main Storage Dump" under "Working with Storage Dumps").</p>		
4404	<p>Auto copy failed or not attempted.</p> <p>Copy the current main storage dump. If copying to system ASP, existing copies may need to be deleted or renamed. Then exit the Main Storage Dump Manager.</p> <p>For more information on how to perform a Main Storage Dump, refer to AS/400 Service Functions information (see "Copying a Main Storage Dump" under "Working with Storage Dumps").</p>		
4405	<p>System ASP threshold exceeded after auto copy done.</p> <p>Delete other system ASP copies or exit the Main Storage Dump Manager and then from DST copy the Auto Copy to media and then delete the Auto Copy in system ASP.</p>		
5001	<p>DST received no response from a work station controller</p> <p>The workstation I/O processor for the system or partition console did not respond.</p> <p>If the system uses an AS/400 Operations Console, perform "Operations Console-PIP1" on page 412.</p> <p>Otherwise, perform "BUS PIP CNSL01" on page 306.</p>	FI00380 AJDG301	
5002	<p>DST problem attempting to use the system console</p> <p>A code problem occurred during an attempt to use the system console.</p> <p>Perform "LIC-PIP3 (5077)" on page 326.</p>	AJDG301 FI00380	
5003	<p>Service program failed</p> <p>The ASCII system console failed to respond.</p>	FI00320 FI00602 UG3USR1 AJDG301 FI00380	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
5004	DST console failed to respond The system console failed to respond. If the system uses an AS/400 Operations Console, perform "Operations Console-PIP1" on page 412. Otherwise, perform "TWSC-PIP1 (5077)" on page 525.	FI00320 FI00602 UG3USR1 AJDG301 FI00380	
5005	Service program failed The workstation adapter system console failed to respond. Perform "WSAC-PIP1" on page 537.	FI00320 FI00602 UG3USR1 AJDG301 FI00380	
5007	Service program failed The workstation adapter console failed to respond. If the system uses an AS/400 Operations Console, perform "Operations Console-PIP1" on page 412. Otherwise, perform "WSAC-PIP1" on page 537.	FI00320 FI00602 UG3USR1 AJDG301 FI00380	
5010	IPL service function ended abnormally Perform "LIC-PIP4 (5077)" on page 327.	AJDG301	
5082	DST lost contact with the console A service program lost contact with the system console. Do you have a twinaxial terminal for the console? No Yes ↓ Perform "TWSC-PIP1 (5077)" on page 525. Perform "WSAC-PIP1" on page 537.	AJDG301 UG3USR1	
5083	IPL service function ended abnormally A service program lost contact with the system console. Perform "TWSC-PIP1 (5077)" on page 525.	AJDG301 UG3USR1	
5090	System startup failed in unattended IPL mode Perform the following: • If reference code A6005090 is displayed on the control panel for more than 10 minutes, perform "LIC-PIP11" on page 337. • For reference code B6005090, perform "LIC-PIP11" on page 337.	FI00580 FI00500 FI00301 FI00021 FI00065 AJDG301	
5092	System is in DASD migration mode "Install Licensed Internal Code" and "Upgrade Load Source" was specified but the key is not in the manual position. Change the key position to manual and perform a system IPL.		
50FF	DST unrecoverable program error Perform "LIC-PIP3 (5077)" on page 326.	AJDG301 FI00380	

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
5120	<p>System LIC detected a program exception</p> <p>System LIC detected a programming problem. If performance or other system degradation is occurring, the system may be operating with reduced resources.</p> <p>Check the Product activity log for related entries. If this reference code is logged with a <i>Class</i> of Informational, then no action is required.</p> <p>Otherwise, perform "LIC-PIP1" on page 323 in "Licensed Internal Code (LIC) Problem Isolation Procedures" on page 322.</p>	AJDG301 FI00130	
5121	<p>System LIC program exception occurred</p> <p>System LIC detected a programming problem for which a main storage dump may have been initiated.</p> <p>A problem log entry may be generated for this ref code.</p> <p>Perform "LIC-PIP1" on page 323.</p>	AJDG301	
5122	<p>System LIC program exception occurred</p> <p>System LIC detected an IOP programming problem for which an IOP dump may have been initiated.</p> <p>Perform "LIC-PIP1" on page 323.</p>	FI00130 AJDG301 FI00131	
5123	<p>System LIC program exception occurred</p> <p>System LIC detected an interface problem with the IOP or an IOP programming problem for which an IOP and main storage dump may have been initiated.</p> <p>Perform "LIC-PIP1" on page 323.</p>	FI00130 AJDG301 FI00131	
5126	Addressed device failed to respond to selection	DISKDRV STORIOA DISKTRY FI01106 FI01140 FI01141 DEVTERM BACKPLN	
5127	IOP timed out a disk command	DISKDRV STORIOA FI01106 DISKTRY FI01140 FI01141 DEVTERM BACKPLN	
5128	I/O processor failure	FI01112 FI01107	
512D	<p>An IOP dump was initiated</p> <p>Copy the IOP dump entry and any related entries from the Product Activity Log to suitable media, and give to an IBM service representative.</p>		

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
512E	<p>System LIC program exception occurred</p> <p>The system was in a D IPL mode when the problem was detected. A main storage dump was not taken.</p> <p>Perform "LIC-PIP1" on page 323.</p>	AJDG301 FI00130	
5206	<p>System LIC detected a missing IOP LIC code load</p> <p>System LIC detected a missing IOP LIC code load during IPL of the IOP. This indicates that either the IOP code load is not installed on the system load source device or that system LIC was unable to successfully read that load from the load source device.</p> <p>Perform "LIC-PIP1" on page 323.</p>	UG3USR1	
5209	<p>System LIC detected an IOP timeout during IOP IPL</p> <p>Verify that all IOP cable connections are secure, and check tape and other non-disk devices and media to verify that they are in a ready state.</p> <p>Perform "LIC-PIP1" on page 323.</p>	UG3USR1 FI00130 AJDG301	
5219	<p>System LIC program exception occurred</p> <p>An IOP signalled to system LIC that it had entered a critical internal state. LIC automatically attempted to restart the IOP.</p> <p>This reference code is logged for information only. No action is required.</p>	FI00310 FI00318 FI00065 FI00130 AJDG301	
5275	<p>The system issued a reset/reload to the IOP.</p> <p>System Licensed Internal Code detected that an IOP Reset/Reload has occurred, and that the IOP successfully recovered.</p> <p>Users who were signed on to a Workstation device under the IOP will need to sign back on. Any LAN/WAN communications lines under the IOP will need to be restarted. Tape/Optical devices under the IOP may need to be varied back on.</p> <p>To determine the cause of the IOP Reset/Reload, check the Product Activity Log for additional entries logged with the same System Log ID, and perform any actions indicated for those errors.</p>		

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
5276	<p>IOP Reset was issued</p> <p>LIC has detected a problem with the Service Processor IOP and has reset it but has not initiated reload of the Service Processor.</p> <p>If the load source is mirrored, some system operations may be able to continue normally. However, some system service operations have been suspended and the system should be scheduled for power down as soon as possible.</p> <p>Perform a system IPL. If the IPL is successful, then perform "LIC-PIP1" on page 323 to determine the cause of the problem.</p> <p>If the system IPL is not successful, perform the action described in the new SRC.</p>	AJGLD01 AJDG301 FI00021	
5310	<p>System LIC program exception occurred</p> <p>System LIC detected a logical partition configuration data consistency error. Copy the Product Activity Log data for this error and any related entries and contact your next level of hardware service support.</p>	LPARSUP	
5311	<p>System LIC program exception occurred</p> <p>LPAR configuration data does not match current system configuration. The system will not IPL past DST until the problem is corrected.</p> <p>Following is a list of problems which may have caused this SRC to be reported:</p> <ul style="list-style-type: none"> • Non-configured disk unit which was previously a load source on a partitioned system. • Load source configuration data does not match partition for which it is being used. • Load source configuration data does not match system serial number for which it is being used. • Load source configuration data is newer than primary partition configuration data. <p>Perform "LPAR-PIP01" on page 364.</p>	LPARSUP	
5312	<p>System LIC program exception occurred</p> <p>LPAR configuration data informational error.</p> <p>The LPAR configuration data was found to be or inconsistent on a secondary partition's load source. The data was automatically updated to the current system level.</p>		
5313	<p>System LIC program exception occurred</p> <p>LPAR configuration data informational error.</p> <p>The LPAR configuration data was found to be inconsistent on a primary partition and could only be corrected with an older copy of the data.</p>	LPARCFG	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
5340	<p>Secondary partition not running at optimum.</p> <p>Check the Primary partition's Product Activity Log for system processor entries from approximately the same time. Perform the actions indicated for those entries. For more information on Logical Partitioning, see the Logical Partitioning Information in the <i>AS/400 Service Functions</i>.</p>		
5341	<p>Secondary partition not running at optimum.</p> <p>Check the primary partition Product Activity Log for system memory entries from approximately the same time. Perform the actions indicated for those entries. For more information on Logical Partitioning, see the Logical Partitioning Information in the <i>AS/400 Service Functions</i>.</p>		
5342	<p>Secondary partition not running at optimum.</p> <p>Check the Primary partition's Product Activity Log for system processor entries from approximately the same time. Perform the actions indicated for those entries. For more information on Logical Partitioning, see the Logical Partitioning Information in the <i>AS/400 Service Functions</i>.</p>		
5343	<p>Secondary partition not running at optimum.</p> <p>Check the Primary partition's Product Activity Log for system memory errors from approximately the same time. Perform the actions indicated for those entries.</p> <p>For more information on Logical Partitioning see the Logical Partitioning Information in the <i>AS/400 Service Functions</i>.</p>		
5344	<p>Secondary partition not running at optimum.</p> <p>The interactive performance specified in the configuration data for this partition could not be met.</p> <p>Contact your next level of support.</p>	LPARSUP	
5350	<p>Secondary partition software release not supported.</p> <p>The logical partition software version is outside the supported release delta. Check the Release Delta from the Primary partition "Display Partition Release Level" screen.</p> <p>Check the LPAR documentation for the release level of the Primary partition and determine what the supported Release Delta is.</p>		
5380	<p>System LIC program exception occurred</p> <p>Record the Product Activity Log (PAL) hex data for this SRC or print the PAL entry.</p> <p>Contact your next level of support.</p>	LPARSUP	
5390	<p>System LIC program exception occurred</p> <p>Record the Product Activity Log (PAL) hex data for this SRC or print the PAL entry.</p> <p>Contact your next level of support.</p>	LPARSUP	
5555	SLIC I/O DASD subsystem error recovery in progress.		

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
6900	<p>System bus error</p> <p>The copper bus, bus 4 in the SPD migrated tower, is inoperative due to a stuck line or a parity error. Any SPD system bus-related hardware on bus 4 may have failed including the HSL (SI) I/O adapter or HSL cable connecting SPD bus 4 to the HSL loop.</p> <p>Perform "BUS-PIP Entry Point" on page 237.</p>	FI00065 AJDG301	
6901	<p>Bus Expansion Adapter card failed</p> <p>The copper bus, the first SPD bus in the system unit or migrated tower, has failed due to an internal chip error on the local bus adapter.</p> <p>Perform "BUS-PIP Entry Point" on page 237.</p> <p>For this reference code the failing item list presented in the "Service Action Log" can be different from the failing item list documented here. That is due to the differences in system models and features installed.</p> <p>If the "Service Action Log" is available then use the failing item list presented there for servicing this reference code.</p> <p>If the "Service Action Log" is not available then use the failing item list documented here. By following the procedures in the symbolic FRUs listed here you will isolate to the correct FRU list based on system model and features installed.</p>	LBUSADP AJDG301	
6902	<p>Bus Expansion Adapter card failed</p> <p>An optical bus has failed due to an internal chip error on one of the remote bus adapters.</p> <p>Perform "BUS-PIP Entry Point" on page 237.</p>	FI00203 AJDG301	
6905	<p>Optical bus failed</p> <p>An optical bus is inoperative due to a stuck line or an invalid bus command. Any bus-related hardware may have failed.</p> <p>Perform "BUS-PIP Entry Point" on page 237.</p> <p>For this reference code the failing item list presented in the "Service Action Log" can be different from the failing item list documented here. That is due to the differences in system models and features installed.</p> <p>If the "Service Action Log" is available then use the failing item list presented there for servicing this reference code.</p> <p>If the "Service Action Log" is not available then use the failing item list documented here. By following the procedures in the symbolic FRUs listed here you will isolate to the correct FRU list based on system model and features installed.</p>	FI00065 LBUSADP AJDG301	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
6906	<p>High Speed Link (SI) adapter failure</p> <p>LIC could not access part of the HSL (SI) I/O adapter VPD. The adapter and HSL (SI) loop may be prevented from becoming operational.</p> <p>For this reference code the failing item list presented in the "Service Action Log" can be different from the failing item list documented here. That is due to the differences in system models and features installed.</p> <p>If the "Service Action Log" is available then use the failing item list presented there for servicing this reference code.</p> <p>If the "Service Action Log" is not available then use the failing item list documented here. By following the procedures in the symbolic FRUs listed here you will isolate to the correct FRU list based on system model and features installed.</p>	SIIOADP	
6907	<p>High Speed Link (SI) adapter failure</p> <p>LIC detected invalid data in the HSL (SI) I/O adapter VPD. The adapter and HSL (SI) loop may not have become operational.</p> <p>For this reference code the failing item list presented in the "Service Action Log" can be different from the failing item list documented here. That is due to the differences in system models and features installed.</p> <p>If the "Service Action Log" is available then use the failing item list presented there for servicing this reference code.</p> <p>If the "Service Action Log" is not available then use the failing item list documented here. By following the procedures in the symbolic FRUs listed here you will isolate to the correct FRU list based on system model and features installed.</p>	SIIOADP	
6908	<p>High Speed Link (SI) adapter failure</p> <p>LIC data in the I/O bus vpd could not be accessed. The I/O Bus identified in the SRC may not have become operational.</p> <p>For this reference code the failing item list presented in the "Service Action Log" can be different from the failing item list documented here. That is due to the differences in system models and features installed.</p> <p>If the "Service Action Log" is available then use the failing item list presented there for servicing this reference code.</p> <p>If the "Service Action Log" is not available then use the failing item list documented here. By following the procedures in the symbolic FRUs listed here you will isolate to the correct FRU list based on system model and features installed.</p>	SIIOADP	

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
6909	<p>High Speed Link (SI) adapter failure</p> <p>LIC detected invalid data in the I/O bus VPD. The bus and resources associated with it may not be operational.</p> <p>For this reference code the failing item list presented in the "Service Action Log" can be different from the failing item list documented here. That is due to the differences in system models and features installed.</p> <p>If the "Service Action Log" is available then use the failing item list presented there for servicing this reference code.</p> <p>If the "Service Action Log" is not available then use the failing item list documented here. By following the procedures in the symbolic FRUs listed here you will isolate to the correct FRU list based on system model and features installed.</p>	SIIOADP	
6910	<p>I/O processor failure</p> <p>An I/O processor timed out, returned bad status, or is not following the system bus protocol.</p> <p>Perform "LIC-PIP7 (5077)" on page 332.</p>	FI00310 FI00318 FI00065 FI00130 AJDG301	
6938	<p>Not valid system configuration detected</p> <p>This system model does not allow a configuration of more than three (non-OptiConnect) I/O Processors.</p> <p>Power down the system and remove the extra (non-OptiConnect) I/O Processor(s) so that there are three or less. Restart the system.</p>		
6944	<p>Missing or failed I/O processor cards</p> <p>A system bus appears to be empty. If the bus is not empty, two I/O processors in consecutive slots may be missing or broken. If there are broken I/O processors, then another more serious SRC has occurred. Otherwise find the bus number for this failure from the Product activity log and use the system configuration list to verify the configuration of the I/O processors on that bus.</p>	FI00317 FI00316 AJDG301	
6960	<p>Multi-adapter bridge card slot error, do not use card slot</p> <p>Slot unavailable due to 64 bit card in adjacent slot.</p> <p>One of the messages documented with the symbolic FRU will describe the problem. See the SLOTErr symbolic FRU for a list of messages and corrective actions.</p>	SLOTErr	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
6961	<p>Multi-adapter bridge card slot error, do not use card slot</p> <p>LED control failure, do not use slot.</p> <p>The card location is not available for use. The Failing Item with the card slot error is in the Failing Item list for this reference code.</p> <p>See the SLOTERR symbolic FRU for the list of messages and a further description of the problem detected by Licensed Internal Code.</p> <p>For this reference code the failing item list presented in the "Service Action Log" can be different from the failing item list documented here. That is due to the differences in system models and features installed.</p> <p>If the "Service Action Log" is available then use the failing item list presented there for servicing this reference code.</p> <p>If the "Service Action Log" is not available then use the failing item list documented here. By following the procedures in the symbolic FRUs listed here you will isolate to the correct FRU list based on system model and features installed.</p>	SLOTERR MASBUS	
6962 to 6963	<p>Multi-adapter bridge card slot error, do not use card slot</p> <p>Power control failure, do not use slot.</p> <p>The card location is not available for use. The Failing Item with the card slot error is in the Failing Item list for this reference code.</p> <p>See the SLOTERR symbolic FRU for the list of messages and a further description of the problem detected by Licensed Internal Code.</p> <p>For this reference code the failing item list presented in the "Service Action Log" can be different from the failing item list documented here. That is due to the differences in system models and features installed.</p> <p>If the "Service Action Log" is available then use the failing item list presented there for servicing this reference code.</p> <p>If the "Service Action Log" is not available then use the failing item list documented here. By following the procedures in the symbolic FRUs listed here you will isolate to the correct FRU list based on system model and features installed.</p>	SLOTERR MASBUS	
6964	<p>Multi-adapter bridge configuration change or error</p> <p>Multi-adapter bridge has no IOP for the I/O adapters.</p> <p>LIC detected I/O adapters under the multi-adapter bridge but did not detect an I/O processor. The I/O adapters are not available.</p> <p>See the MABRCFG symbolic FRU for the list of messages, a further description of the problem detected by Licensed Internal Code and the corrective action.</p>	MABRCFG	

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
6965	<p>Multi-adapter bridge configuration change or error</p> <p>Card type not supported in this slot.</p> <p>An I/O processor or I/O adapter card type is installed in the location indicated in word 7 of the SRC. The card type is not supported in that slot under the Multi-adapter bridge. The card is unavailable.</p> <p>See the MABRCFG symbolic FRU for the list of messages, a further description of the problem detected by Licensed Internal Code and the corrective action.</p>	MABRCFG	
6966	<p>Multi-adapter bridge configuration change or error</p> <p>I/O processor removed from multi-adapter bridge card slot.</p> <p>On the previous IPL an I/O processor was in the card location specified in word 7 of the SRC. The I/O processor was not detected on this IPL.</p> <p>See the MABRCFG symbolic FRU for the list of messages, a further description of the problem detected by Licensed Internal Code and the corrective action.</p>	MABRCFG	
6967	<p>Multi-adapter bridge configuration change or error</p> <p>I/O adapter unavailable due to moved I/O processor card.</p> <p>The I/O adapter specified in word 7 of the SRC is not available. On the previous IPL there was an I/O processor card the adapter was assigned to. The I/O processor was not detected on this IPL.</p> <p>See the MABRCFG symbolic FRU for the list of messages, a further description of the problem detected by Licensed Internal Code and the corrective action.</p>	MABRCFG	
6968	<p>Multi-adapter bridge configuration change or error</p> <p>IOA removed from multi-adapter bridge slot.</p> <p>On the previous IPL an I/O adapter was in the card slot specified in word 7 of the SRC. That I/O adapter was not detected on this IPL.</p> <p>See the MABRCFG symbolic FRU for the list of messages, a further description of the problem detected by Licensed Internal Code and the corrective action.</p>	MABRCFG	
6969	<p>Multi-adapter bridge configuration change or error</p> <p>I/O adapter replaced by I/O processor card.</p> <p>On the previous IPL there was an I/O adapter in the location specified in word 7 of the SRC. This IPL LIC detected that the IOA was replaced by an IOP in that location.</p> <p>See the MABRCFG symbolic FRU for the list of messages, a further description of the problem detected by Licensed Internal Code and the corrective action.</p>	MABRCFG	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
6970	<p>High Speed Link (SI) resource failure</p> <p>A system PCI bus failure was detected. Word 7 of the SRC contains the bus number.</p> <p>This error is most likely in the hardware that makes up the PCI bus, the PCI bus side of the HSL I/O adapter or the multi-adapter bridge. In some cases it may be caused by a failing IOP in the multi-adapter bridge's domain. When an IOP is causing the problem, the failing IOP cannot be identified.</p> <p>For this reference code the failing item list presented in the "Service Action Log" can be different from the failing item list documented here. That is due to the differences in system models and features installed.</p> <p>If the "Service Action Log" is available then use the failing item list presented there for servicing this reference code.</p> <p>If the "Service Action Log" is not available then use the failing item list documented here. By following the procedures in the symbolic FRUs listed here you will isolate to the correct FRU list based on system model and features installed.</p>	<p>SI_PHB PRI_PCI MA_BRDG PIOCARD</p>	
6971	<p>High Speed Link (SI) resource failure</p> <p>Failure in a multi-adapter bridge or on the bus to the card location it controls.</p> <p>For this reference code the failing item list presented in the "Service Action Log" can be different from the failing item list documented here. That is due to the differences in system models and features installed.</p> <p>If the "Service Action Log" is available then use the failing item list presented there for servicing this reference code.</p> <p>If the "Service Action Log" is not available then use the failing item list documented here. By following the procedures in the symbolic FRUs listed here you will isolate to the correct FRU list based on system model and features installed.</p> <p>Perform "Bus PIP MAB-02" on page 307</p>	<p>MA_BRDG MASBUS PIOCARD</p>	
6972	<p>High Speed Link (SI) resource failure</p> <p>Multi-adapter Bridge (MaB) failure detected.</p> <p>For this reference code the failing item list presented in the "Service Action Log" can be different from the failing item list documented here. That is due to the differences in system models and features installed.</p> <p>If the "Service Action Log" is available then use the failing item list presented there for servicing this reference code.</p> <p>If the "Service Action Log" is not available then use the failing item list documented here. By following the procedures in the symbolic FRUs listed here you will isolate to the correct FRU list based on system model and features installed.</p>	<p>MA_BRDG</p>	

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
6973	High Speed Link (SI) resource failure Multit-adapter Bridge has detected a problem in the card installed in the location specified in word 7 of the SRC.	PIOCARD	
6974	Multi-adapter bridge configuration change or error PCI I/O processor rejected the assignment of or the removal of an I/O adapter. The direct select address in word 7 of the SRC specifies the location of the IOA. The direct select address of the IOP is in word 5 of the SRC. Use slot concurrent maintenance under HSM to assign or remove the IOA.	MABRCFG	
6975	The system issued a reset/reload to the service processor. Service processor error.	AJDGP01	
6976	Service processor failure. For this reference code the failing item list presented in the "Service Action Log" can be different from the failing item list documented here. That is due to the differences in system models and features installed. If the "Service Action Log" is available then use the failing item list presented there for servicing this reference code. If the "Service Action Log" is not available then use the failing item list documented here. By following the procedures in the symbolic FRUs listed here you will isolate to the correct FRU list based on system model and features installed.	SVCPROC	
6980	High Speed Link (SI) controller failure The FRU list displayed in the Service Action Log (SAL) may vary from the failing item list given in this document. Use the FRU list in the SAL if the SAL is available to you.	SICNTRL	
6981	High Speed Link (SI) adapter failure The FRU list displayed in the Service Action Log (SAL) may vary from the failing item list given in this document. Use the FRU list in the SAL if the SAL is available to you. If you find either a B600 6982 or B600 6984 SRC logged at approximately the same time as this SRC then they were caused by the same failure. If you find a 6982 SRC logged at approximately the same time then close this problem and service the 6982 SRC. The failing item listed for this SRC is one of the failing items listed for B600 6982. If the SAL entry for this SRC has a location listed then record the location for use in servicing the 6982 SRC.	SIIOADP	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
6982	<p>High Speed Link (SI) connection failure</p> <p>Connection failure between HSL (SI) components. The connection could be between the HSL controller and an HSL (SI) I/O adapter or between any two HSL I/O adapters. HSL connections also exist embedded in system units and HSL (SI) interposer cards.</p> <p>This SRC may also appear in the SAL with a B600 6984 logged at approximately the same time. In that case both SRCs are reporting the same failure.</p> <p>The FRU list displayed in the Service Action Log (SAL) may vary from the failing item list given in this document. Use the FRU list in the SAL if the SAL is available to you.</p> <p>If the HSL I/O adapter (failing item SIIOADP) does not have a location in the SAL entry then search the SAL for a B600 6981 SRC from approximately the same time that this SRC was logged. The failing item in the 6981 is the same HSL I/O adapter in the failing item list of this SRC. Record the location of the failing item in the 6981 SRC and use that location for the SIIOADP failing item in this SRC.</p> <p>If you are using the FRU list in the SAL and there is only one FRU listed in the SAL then that is the failing item.</p>	SIIOADP SICNTRL SIRGCBL	
6983	<p>An invalid System Interconnect configuration was detected.</p> <p>An HSL (SI) loop has an invalid configuration. Word 4 of the SRC contains the program return code (PRC) which identifies the problem with the loop's configuration. Use the PRC and the FRU listed to determine the problem.</p> <p>If you are using the Service Action Log (SAL) the FRU description may already indicate the configuration problem.</p>	SIRGCFG	
6984	<p>System Interconnect loop status message.</p> <p>An HSL (SI) I/O loop has switched to its alternate path. This is an informational SRC only.</p> <p>Word 7 of the SRC contains the loop number in the leftmost 4 digits. The loop number is in hexadecimal format. You must convert the hexadecimal loop number into decimal format to recognize the loop number in HSM.</p> <p>This SRC can be caused by a tower on the HSL loop powering off.</p> <p>This SRC may also appear in the SAL with a B600 6982 or B600 6981 logged at approximately the same time. In that case the other SRC is reporting a failure and this SRC is reporting that the alternate HSL path is now being used. Service the other SRC if present, otherwise ignore this SRC.</p>		

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
6985	<p>System Interconnect loop status message.</p> <p>Determine if this SRC is informational or requires a service action by doing the following:</p> <p>If this SRC appears in the Service Action Log (SAL) then it requires a service action. There is a problem in the loop. The HSL loop or failing items identified in the FRU description(s) of the SAL have a failure at an HSL link. The link is either completely failed or running at a slower than normal speed.</p> <p>If this SRC does not appear in the SAL then this SRC is informational only. Use symbolic FRU "SIRSTAT" to determine what this informational SRC means.</p>	<p>SIOADP SICNTRL SIRGCBL</p>	
6986	<p>System bus error</p> <p>During IPL, system LIC detected an HSL I/O adapter that was already initialized. The adapter should have been in a flushed and uninitialized state after powering on. There is a problem with SPCN components that prevented the tower from powering off after a previous power off was issued. The tower will not be configured for this IPL.</p> <p>This reference code is equivalent to 1xxx 90F0. When referring to the "CBLALL" symbolic FRU in the Failing Item list, perform the "CBLALL" procedure using reference code "90F0".</p> <p>Word 5 of the SRC identifies the frame. Determine the frame by breaking down word 5:</p> <p>Word 5 -> xxxx xxNN where: NN is the frame number in hexadecimal format.</p>	<p>TWRCARD CBLALL</p>	
6990	<p>Service processor failure.</p> <p>The FRU list displayed in the Service Action Log (SAL) may vary from the failing item list given in this document. Use the FRU list in the SAL if the SAL is available to you.</p>	SVCPROC	
6991 to 6992	Service processor failure.	AJDGP01	
6993	<p>Service processor failure.</p> <p>A failure occurred with the service processor hardware or the service processor LIC.</p> <p>The FRU list displayed in the Service Action Log (SAL) may vary from the failing item list given in this document. Use the FRU list in the SAL if the SAL is available to you.</p>	<p>SVCPROC AJDGP01</p>	
6994	<p>Service processor failure.</p> <p>The FRU list displayed in the Service Action Log (SAL) may vary from the failing item list given in this document. Use the FRU list in the SAL if the SAL is available to you.</p>	SVCPROC	
699C	<p>Wrap plug is installed on Bus Expansion Adapter card</p> <p>This reference code is for information only. It indicates the presence of a wrap plug on the local optical link card.</p>		

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
69A8	<p>Informational bus reference code</p> <p>This reference code is for information only and might include the following:</p> <ul style="list-style-type: none"> • Optical speed encode • Broken optical links now operational • Other information 		
69B8	<p>Bus hardware configuration problem</p> <p>The optical bus cabling is not connected correctly.</p> <p>Perform "BUS-PIP Entry Point" on page 237.</p>	FI00187 AJDG301	
69C1	<p>A failure occurred on another system</p> <p>Perform "BUS-PIP Entry Point" on page 237.</p>	FI01040 FI00206 FI00182 AJDG301	
69C5	<p>I/O processor failure</p> <p>The OptiConnect/400 card which connects this system to another system has failed. The failing card is located in an I/O processor card slot.</p> <p>Perform "BUS-PIP Entry Point" on page 237.</p>	FI00206 FI01040 AJDG301	
69D0	<p>Bus Expansion Adapter card failed</p> <p>An internal error was detected on a local optical link card.</p> <p>Perform "BUS-PIP Entry Point" on page 237.</p>	FI00182 FI00055 AJDG301	
69D8	<p>Bus Expansion Adapter failed</p> <p>A primary optical link had a failure. Contact with the bus may still be possible through this link or through a redundant link.</p> <p>Perform "BUS-PIP Entry Point" on page 237.</p> <p>For this reference code the failing item list presented in the "Service Action Log" can be different from the failing item list documented here. That is due to the differences in system models and features installed.</p> <p>If the "Service Action Log" is available then use the failing item list presented there for servicing this reference code.</p> <p>If the "Service Action Log" is not available then use the failing item list documented here. By following the procedures in the symbolic FRUs listed here you will isolate to the correct FRU list based on system model and features installed.</p>	FI00182 FI00203 FI00055 LBUSADP AJDG301	
69E0	<p>Bus Expansion Adapter card failed</p> <p>An internal error was detected on a remote bus adapter card.</p> <p>Perform "BUS-PIP Entry Point" on page 237.</p>	FI00203 AJDG301	

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
69E8	<p>Bus Expansion Adapter failed</p> <p>Redundancy has been lost due to a secondary optical link failure. Contact with the bus may still be possible through the primary optical link.</p> <p>Perform "BUS-PIP Entry Point" on page 237.</p>	<p>FI00203 FI00205 FI00057 AJDG301</p>	
69F0	<p>Bus Expansion Adapter failed</p> <p>Contact has been lost to the bus.</p> <p>Perform "BUS-PIP Entry Point" on page 237.</p>	<p>FI00180 FI00182 FI00203 FI00056 FI00205 LBUSADP AJDG301</p>	
69F8	<p>Bus Expansion Adapter failed</p> <p>An optical link initialization failure occurred. The number and configuration of the system buses can not be determined.</p> <p>Perform "BUS-PIP Entry Point" on page 237.</p>	<p>FI00180 FI00203 FI00182 FI00186 FI00057 AJDG301</p>	
7001	ISDN call in rejected	GG3COMM	
7002	Lines not selected	GG3COMM	
7003	Network interfaces not selected	GG3COMM	
7004	<p>TCP/IP informational error</p> <p>This reference code is logged when the TCP/IP Attribute "Log Protocol Errors" is set, and the TCP/IP System LIC "silently discards" an inbound datagram. "Silently discard" is defined to mean discard the received datagram without reporting an error to the originating host device. Examples of such datagrams are those with checksums or destination addresses which are not valid.</p> <p>This reference code is for information only. Normally no action should be taken as a result of this reference code. It is generated in order to assist with remote device or TCP/IP network problem determination.</p>		
7055	<p>Statistics were logged, no service action required</p> <p>This reference code is logged for information only.</p>		
7100	<p>APPN session initiation attempt has timed out</p> <p>This reference code is used to indicate that LIC timed out on a request to initiate a session.</p> <p>The user must run problem analysis for this reference code. If this indicates a software problem, the user should dial IBM Software Support for assistance.</p> <p>The Problem Determination Procedure (PDP) will indicate whether the original timeout condition still exists and what the corrective actions should be.</p>	<p>AJDG301 GG3PL03 GG3PL01 GG3PL02</p>	

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
7101	<p>APPN session initiation attempt has failed</p> <p>This reference code is used to indicate that LIC attempted to satisfy a session initiation request, but some failure condition was detected by LIC. The failure condition could be a configuration or operational problem in the network.</p> <p>The user must run problem analysis for this reference code. If this indicates a software problem, the user should dial IBM Software Support for assistance.</p> <p>The Problem Determination Procedure (PDP) will indicate whether the original timeout condition still exists and what the corrective actions should be.</p>	GG3PL04 GG3PL05 GG3PL06 AJDG301	
7102	APPN CP-CP session ended.		
7201	<p>A utility failure occurred.</p> <p>This reference code is for information only. The Uninterruptible Power System (UPS) is reporting a utility failure.</p>		
7202	<p>Utility power restored.</p> <p>This reference code is for information only. The Uninterruptible Power System (UPS) is reporting that utility power has been restored.</p>		
7203	<p>A battery low condition was detected.</p> <p>This reference code is for information only. The Uninterruptible Power System (UPS) is reporting a battery low condition.</p>		
7204	<p>Uninterruptible Power System reported a bypass active</p> <p>This reference code is for information only. The Uninterruptible Power System (UPS) is reporting a bypass is active.</p>		
7205	<p>Battery low condition was reset.</p> <p>This reference code is for information only. The Uninterruptible Power System (UPS) is no longer reporting a battery low condition.</p>		
7206	<p>UPS reported bypass no longer active</p> <p>This reference code is for information only. The Uninterruptible Power System (UPS) is no longer reporting a bypass active condition.</p>		
7207	<p>Battery Power Unit needs service</p> <p>The replacement period for BPU 1, installed in the System Unit, has been exceeded.</p>	FI00315	
7208	<p>Battery Power Unit needs service</p> <p>The replacement period for BPU 2, installed in the System Unit, has been exceeded.</p>	FI00315	
7209	<p>Battery Power Unit needs service</p> <p>The replacement period for BPU 1, installed in the Expansion Unit, has been exceeded.</p>	FI00315	

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
720A	Battery Power Unit replacement dates do not match The replacement dates for one of the Battery Power Units do not match. Run "Display Hardware Configuration" and verify that the dates match the labels on the batteries.		
7701	SCSI jumper card was not detected.	21H7625 BACKPLN	
7702	Incorrect SCSI jumper card detected	21H7625	
7703	System LIC detected a program exception Storage Management detected a DASD datacheck condition and the defective sector was reallocated. Perform a system IPL to restart the system.		
7704	General failure detected by HRI component.	AJDG301	
7777	Hardware configuration change detected A hardware resource is missing. The resource reported in to the system on a previous IPL, but has not reported in on the current IPL. This could occur for several different reasons. 1. It could be a normal situation where the resource is currently powered off. In this case, when the resource is powered back on, it will no longer be missing. 2. The hardware resource could also be missing if it has been removed from the system, for example, a tape drive that was replaced with a different tape drive. The service representative should use the Hardware service manager to remove the entry for this resource. 3. The resource may not have reported in on this IPL because it is failing. Perform problem analysis to determine why the resource is failing.		
CFFC	Optical library device condition not expected The optical disk drive addressing within the optical library is incorrect. This error is likely to be the result of faulty cabling or switch setting following service to an optical library. Contact your hardware service provider.	OPTLCBL DRVSWCH	
CFFD	Optical drive failure	OPTLDRV	
CFFF	Media determined to be bad in Optical library		
F103	Main storage dump must be copied for service. Perform "LIC-PIP1" on page 323.		
FDC0	LIC program reported informational error This reference code is logged for information only. No action required.		
FDC3	Error detected in LIC and data was captured This reference code indicates first failure data capture (FFDC) data was collected for a problem reported by licensed internal code program #C3TSSIO. The user should dial IBM Software Support for assistance.	GG3FFDC FI00330 AJGLD01	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item	Location
FDC5	LIC program failed and data was captured This reference code indicates first failure data capture (FFDC) data was collected for a problem reported by licensed internal code. The user should dial IBM Software Support for assistance.	GG3FFDC	

Licensed Internal Code (LIC) Failing Items

Failing Item	Description	Document Description
21H7625	Incorrect, defective or missing SCSI jumper card	Repair and Parts; removal and installation procedures
AJDG301	Licensed Internal Code	Service Functions; APAR or LICTR
AJDGP01	Service processor Licensed Internal Code	Repair and Parts; removal and installation procedures
AJGLD01	I/O card Licensed Internal Code	Service Functions; APAR or LICTR
BACKPLN	Card enclosure or backplane	Problem Analysis; Symbolic FRU Isolation
BSTWRPL	I/O tower card	Problem Analysis; Symbolic FRU Isolation
CBLALL	Cable Unit Part	Problem Analysis; Symbolic FRU Isolation
CVTCARD	System Interconnect SPD migration card	Problem Analysis; Symbolic FRU Isolation
DEVTERM	Terminating plug	Problem Analysis; Symbolic FRU Isolation
DISKDRV	Disk drive and logic card	Problem Analysis; Symbolic FRU Isolation
DISKTRY	Disk unit tray	Problem Analysis; Symbolic FRU Isolation
DRVSWCH	Drive address switch	Problem Analysis; Symbolic FRU Isolation
GG3COMM	Communications failure	
GG3FFDC	LIC program failed and data was captured	
GG3PL01	System performance problem	
GG3PL02	Network performance problem	
GG3PL03	Switched link activation failure message not answered	
GG3PL04	Transmission groups in the network must be activated	
GG3PL05	Class-of-service specified does not provide a route	
GG3PL06	COS acceptable TGs and nodes do not exist for the route	
LBUSADP	System bus adapter failed	Problem Analysis; Symbolic FRU Isolation
LPARCFG	Configuration error	Problem Analysis; Symbolic FRU Isolation
LPARSUP	Call your next level of support for assistance	Problem Analysis; Symbolic FRU Isolation
MABRCFG	Multi-adapter bridge configuration change or error	Problem Analysis; Symbolic FRU Isolation
MASBUS	Multi-adapter bridge card slot or card bus	Problem Analysis; Symbolic FRU Isolation
MA_BRDG	Multi-adapter bridge	Problem Analysis; Symbolic FRU Isolation

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Failing Item	Description	Document Description
OPTDRIV	Optical Disk Drive	Problem Analysis; Symbolic FRU Isolation
OPTLCBL	Optical Library drive cabling	Problem Analysis; Symbolic FRU Isolation
OPTLDRV	Optical Library optical drive	Problem Analysis; Symbolic FRU Isolation
PIOCARD	PCI I/O processor or adapter card	Problem Analysis; Symbolic FRU Isolation
PPCIMIN	System PCI bus hardware	Problem Analysis; Symbolic FRU Isolation
PPCISYS	System PCI bus hardware	Problem Analysis; Symbolic FRU Isolation
PPCITWR	System PCI bus hardware	Problem Analysis; Symbolic FRU Isolation
PRI_PCI	System PCI bus hardware	Problem Analysis; Symbolic FRU Isolation
SIADPCD	System Interconnect I/O adapter	Problem Analysis; Symbolic FRU Isolation
SICNTRL	System Interconnect controller	Problem Analysis; Symbolic FRU Isolation
SIIOADP	System Interconnect I/O adapter	Problem Analysis; Symbolic FRU Isolation
SIRGCBL	System Interconnect cable, connection or interposer card	Problem Analysis; Symbolic FRU Isolation
SIRGCFG	Configuration error	Problem Analysis; Symbolic FRU Isolation
SIRSTAT	System Interconnect cable, connection or interposer card	Problem Analysis; Symbolic FRU Isolation
SI_CARD	System Interconnect controller	Problem Analysis; Symbolic FRU Isolation
SI_PHB	System PCI bus hardware	Problem Analysis; Symbolic FRU Isolation
SLOTERR	Multi-adapter bridge card slot error, do not use card slot	Problem Analysis; Symbolic FRU Isolation
STORIOA	Active I/O processor	Problem Analysis; Symbolic FRU Isolation
SVCPROC	Service Processor Card	Problem Analysis; Symbolic FRU Isolation
SYSBKPL	System unit backplane	Problem Analysis; Symbolic FRU Isolation
TWRBKPL	I/O tower card	Problem Analysis; Symbolic FRU Isolation
TWRCARD	Card enclosure or backplane	Problem Analysis; Symbolic FRU Isolation
TWRPLNR	I/O tower card	Problem Analysis; Symbolic FRU Isolation
UG3USR1	Operator response required	

Chapter 3. Problem Isolation Procedures (PIPs), Failing Items, and Symbolic FRU Isolation

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Problem Isolation Procedures

ASCII Workstation I/O Processor Problem Isolation Procedures

Overview

This section contains the procedures necessary to isolate a failure that is detected by the ASCII workstation I/O processor. These procedures are used when no display is available with which to perform online problem analysis.

The workstation I/O processor detected an error while communicating with the workstation which is used as the primary console.

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 or Expansion Tower" on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

To prevent a possible electrical shock when adding or removing any devices to or from the system, ensure that the power cords for those devices are unplugged before the signal cables are connected or disconnected. If possible, disconnect all power cords from the existing system before you add or remove a device. (RSFTD203)

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent a possible electrical shock, do not use the port tester during electrical storms. (RSFTD006)

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

ASCII Workstation PIPs

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

Read and understand the following service procedures before using this section:

- “Powering On and Powering Off the System or Expansion Tower” on page 868
- “Determining a Primary or Alternative Console” in the *AS/400 Service Functions* information

ASCII-PIP1

Introduction: This procedure isolates problems to the ASCII workstation I/O processor card, its interface to the consoles, the console and alternative console, and the console configuration.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 225 before continuing with this procedure.

1. Were the console and the alternative console powered on before starting the IPL (see “Determining a Primary or Alternative Console” in the *AS/400 Service Functions* information)?

No **Yes**

↓ Go to step 3 of this procedure.

2. Power on the console and the alternative console.
3. Perform an IPL from disk (see “Initial Program Load (IPL) Information” in the *AS/400 Service Functions* information).

Does the IPL complete successfully?

No **Yes**

↓ **This ends the procedure.**

4. Ensure that the following conditions for the console are met. If you need additional information, see the *ASCII Work Station Reference* information.
 - The ASCII workstation that is used as the console must be an IBM 315x, an IBM 316x, or a display that is equal to these.
 - The console must be attached to port 0.

Note: If the system has logical partitions, this is true only for the Primary partition. To locate the console for a secondary partition see *AS/400 Service Functions*.

- The device settings for the console must be correct. See the example in the next step of this procedure.
5. Enter the correct device settings by doing the following:
 - a. Press and hold the Control (CTRL) key, then press the Setup key. A display that shows the device settings appears.

- b. Enter the correct settings.

Note: See the device service information for the correct settings.

For example, the device settings for the 3161 are:

Device Settings	Enter
Machine Mode	3161
Operation Mode	echo
Interface	EIA 232-C
Line Control	IPRTS
Line Speed (bps)	19,200 bps
Parity	even
Stop Bit	1
Word Length (bits)	8

- c. The cable that connects the console to the system must be a *direct* (8-wire) cable.

Note: There are several different cable types available. Ensure that you are using a *direct* (8-wire) cable.

- d. All cable connections must be tight and have no visible damage.

6. Is the system powered off?

Yes No

↓ Go to step 9 of this procedure.

7. Perform the following:

- a. Select Manual mode on the control panel.
- b. Power on the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
- c. Wait for one of the following to appear:
 - A display on the console
 - The System Attention light and a reference code on the control panel

Does a display appear on the console?

Yes No

↓ Go to step 10 of this procedure.

8. Select the *Perform an IPL* option to continue performing an IPL.

This ends the procedure.

9. Perform an IPL by doing the following:

- a. Select Manual mode on the control panel (see *AS/400 Service Functions*).
- b. Select function 03 (Start IPL) on the control panel and press Enter.
- c. Wait for one of the following to appear:
 - A display on the console or alternative console
 - The System Attention light and a reference code on the control panel

Does a display appear on the console?

No Yes

↓ Select the *Perform an IPL* option to continue performing an IPL.

This ends the procedure.

ASCII Workstation PIPs

10. Does the same reference code that sent you to this procedure occur?

Yes **No**

↓ A different system reference code (SRC) or reference code occurred. Use the new SRC or reference code to correct the problem (see "Chapter 2. Unit Reference Codes" on page 17).

This ends the procedure.

11. Is there an alternative console?

Note: The alternative console is the workstation that is attached to port 0 of the second workstation I/O processor. (See "Determining a Primary or Alternative Console" in the *AS/400 Service Functions* information.)

Note: If the system has logical partitions, this is true only for the Primary partition. To locate the alternative console for a secondary partition see *AS/400 Service Functions*.

Yes **No**

↓ Go to step 24 of this procedure.

12. Make dedicated service tools (DST) available by doing the following (see "Dedicated Service Tools (DST)" in the *AS/400 Service Functions* information):
- Ensure that the alternative console is powered on.
 - Ensure that the Manual mode on the control panel is selected.
 - Select function 21 (Make DST Available) on the control panel and press Enter.

Does a display appear on the console or on the alternative console?

No **Yes**

↓ Exit DST.

This appears to be a software problem. Ask your next level of support for assistance.

This ends the procedure.

13. Does the same reference code that sent you to this procedure occur?

Yes **No**

↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see "Chapter 2. Unit Reference Codes" on page 17).

This ends the procedure.

14. Is the alternative console an ASCII workstation?

No **Yes**

↓ Go to step 20 of this procedure.

15. Is the alternative console a LocalTalk** workstation?

Yes **No**

↓ Go to step 18 of this procedure.

16. You must select the icon on the workstation to make it the console (if you have not already done this). You must also save the console selection. For more information see *Local Device Configuration* and *LAN, Frame-Relay and ATM Support* books.

ASCII Workstation PIPs

Did you correct any of the items that are listed above?

No **Yes**

↓ Go to step 26 of this procedure.

17. Go to step 29 of this procedure.

18. The alternative console is a twinaxial display. Ensure that the following conditions are met and if they are not, correct them:

- 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. The twinaxial alternative console address must be 0 on port 0 of the second workstation I/O processor. See the workstation service information if you need help with checking addresses.

- The last workstation on the failing port must be terminated. Any other workstations on that port must not be terminated.

Note: See the service information that was used to set up the workstations if you need more information on terminating twinaxial workstations.

- The cables attached to the console on the failing port must be tight and have no visible damage.

Did you need to correct any of the above conditions?

Yes **No**

↓ Go to step 29 of this procedure.

19. Perform an IPL by doing the following:

- a. Ensure that alternative console is powered on.
- b. Select Manual mode on the control panel.
- c. Select function 03 (Start IPL) on the control panel and press Enter.
- d. Go to step 22 of this procedure.

20. Ensure that the following conditions for the alternative console are met. If they are not, correct them (see the *ASCII Work Station Reference* information if you need additional information):

- The ASCII workstation being used as the alternative console must be an IBM 315x, an IBM 316x, or a display that is equal to these.
- The device settings for the alternative console must be correct. See the following example.
 - Press and hold the Control (CTRL) key, then press the Setup key. A display that shows the device settings appears.
 - Enter the correct settings.

Note: See the specific device information for the correct settings for the device.

For example, the device settings for the 3161 are:

Device Settings	Enter
Machine Mode	3161
Operation Mode	echo
Interface	EIA 232-C
Line Control	IPRTS
Line Speed (bps)	19,200 bps

ASCII Workstation PIPs

Device Settings	Enter
Parity	even
Stop Bit	1
Word Length (bits)	8

- The cable that connects the alternative console to the system must be a *direct* (8-wire) cable.

Note: There are several different cable types available. Ensure that you are using a *direct* (8-wire) cable.

- All cable connections must be tight and have no visible damage.
If there were any cable changes in this area, check them over carefully.

Did you need to correct any of the above conditions?

Yes No

↓ Go to step 24 of this procedure.

21. Perform an IPL by doing the following:
- a. Ensure that the alternative console is powered on.
 - b. Select Manual mode on the control panel.
 - c. Select function 03 (Start IPL) on the control panel and press Enter.
 - d. Wait for one of the following to appear:
 - A display on the console
 - The System Attention light and a reference code on the control panel

22. Does a display appear on the console or on the alternative console?

No Yes

↓ Continue to perform an IPL.

This ends the procedure.

23. Does the same reference code that sent you to this procedure occur?

Yes No

↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see "Chapter 2. Unit Reference Codes" on page 17).

This ends the procedure.

24. Do you have another available, working IBM 315x, IBM 316x, or a display that is equal to these?

Yes No

↓ Go to step 29 of this procedure.

25. Exchange the console with the working display.

26. Perform an IPL by doing the following:

- a. Select Manual mode on the control panel.
- b. Select function 03 (Start IPL) on the control panel and press Enter.
- c. Wait for one of the following to appear:
 - A display on the console
 - The System Attention light and a reference code on the control panel

Does a display appear on the console?

No Yes

↓ The original console is the failing item. Select the *Perform an IPL* option to continue performing an IPL.

This ends the procedure.

27. Did reference 5082 send you to this procedure?

No Yes

↓ Perform “LIC-PIP3 (5077)” on page 326.

This ends the procedure.

28. Perform the following:

a. Exchange the following parts:

Failing Item	Probable Cause (%)
ASCII workstation IO processor card	50
Cable used to attach to the console	40
ASCII 6–port attachment	10

b. Power on the system.

This ends the procedure.

29. Perform the following:

a. Exchange the following parts:

Failing Item	Probable Cause (%)
ASCII workstation IO processor card	40
Cable used to attach to the console	30
Console	20
ASCII 6–port attachment	10

b. Power on the system.

This ends the procedure.

ASCII-PIP2

Introduction: This procedure isolates problems on the ASCII workstation I/O processor card and the 12-port attachment.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 225 before continuing with this procedure.

1. Do you have a 12-port attachment?

Yes No

↓ Perform the following:

- a. Exchange the first workstation I/O processor card (see “Chapter 4. Removal and Installation Procedures” on page 593).
- b. Power on the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).

ASCII Workstation PIPs

This ends the procedure.

2. Power off the system unit or the expansion tower where the failing workstation is connected. (See “Powering On and Powering Off the System or Expansion Tower” on page 868.)
3. **DANGER**

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

- a. Find the ASCII workstation I/O processor card to which the failing workstation is connected.
 - b. Disconnect the 12-port attachment from the ASCII workstation I/O processor card (see “Chapter 4. Removal and Installation Procedures” on page 593).
4. Perform an IPL by doing the following:
 - a. Select Manual mode on the control panel (see *AS/400 Service Functions*).
 - b. Power on the system.

Does a display appear on the console?

No Yes

↓ The 12-port attachment is the failing item. Exchange the 12-port attachment.

Power on the system.

This ends the procedure.

5. Does the same reference code that sent you to this procedure occur?

Yes No

↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17).

This ends the procedure.

6. Exchange the ASCII workstation I/O processor card to which the failing workstation is connected.

Power on the system.

This ends the procedure.

Bus Problem Isolation Procedures

Overview

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

Reference Materials:

- “Expansion Tower Locations and Addresses” on page 687.
- “Powering On and Powering Off the System or Expansion Tower” on page 868.
- “Chapter 4. Removal and Installation Procedures” on page 593.

- “Start a Service Tool” and “Control Panel Functions”, in the *AS/400 Service Functions* information.

Read all safety notices before servicing the system. Observe all safety procedures when performing a procedure. Unless instructed otherwise, always power off the system before removing, exchanging, or installing a field-replaceable unit (FRU).

Attention: To prevent overheating problems, do not remove any SPD (book) card completely from the card enclosure unless you install an airflow card in its place.

Attention: Disconnecting or removing the type 2620 or type 2628 cryptographic I/O processor causes the loss of the master encryption key. Read “Important Cryptographic I/O Processor Information” on page 884 before disconnecting or removing the cryptographic I/O processor.

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

This procedure allows you to do the following:

- Determine the correct bus number

Bus hardware SRCs are listed in the service action log, product activity log, or on the control panel.

Breaking Down The SRC: This table defines the fields of the SRC and their corresponding Control Panel function. Word 7 of the SRC allows you to determine the correct Bus number, bus type, and logical card number from the Direct Select Address (DSA).

Table 2. SRC Break Down Table

SRC Word/Number	Control Panel Function	Panel Function Characters	Format	Description
1	11	1-8	B600 uuuu	uuuu = unit reference code (69xx)
1-extended SRC information	11	9-16	iiii	Frame ID of the failing resource

Bus PIPs

Table 2. SRC Break Down Table (continued)

SRC Word/Number	Control Panel Function	Panel Function Characters	Format	Description
1-extended SRC information	11	17-24	ffff	Frame location
1-extended SRC information	11	25-32	bbbb	Board position
2	12	1-8	MIGVEP62	See the <i>AS/400 Service Functions</i> information for details.
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
7	13	9-16	BBBB Ccbb	Bus, Card, board Direct Select Address (DSA).
8	13	17-24	TTTT MMMM	Type and Model of failing item (if non-zero)
9	13	25-32	uuuu uuuu	Unit Address (if non-zero)

Card Position Tables:

Table 3. FC 503x Migrated Tower Base Unit Card Position Table

Bus Number (BBBB in DSA / logical address)	Card number (Cc in DSA / logical address)	Item DSA Points to	Position label
0004	01	IOP (embedded)	C00
		IOA	C04 (if card installed in C07)
		IOA	C05 (if card installed in C07)
		Bridge Card	C06
		INS	C07
		IOA	C08
		IOA	C09
		IOA	C10
		IOA	C11
	02	IOA	C01
		IOA	C02
		IOP	C03
		IOA	C04 (If no card installed in C07)
		IOA	C05 (If no card installed in C07)

Table 4. FC 5034, FC 5035 Migrated Tower PCI Expansion Unit Card Position Table

Bus Number (BBBB in DSA / logical address)	Card number (Cc in DSA / logical address)	Item DSA Points to	Position label
0005	01	IOA	E12
		IOA	E13
		IOA	E14
		IOP	E15
		IOA	E16
		IOA	E17
		IOA	E18
		INS	E19
		Bridge Card	E20
	02	IOA	E07
		IOA	E08
		IOA	E09
		IOP	E10
		IOA	E11
	03	IOA	E02
		IOA	E03
		IOA	E04
		IOP	E05
		IOA	E06

Table 5. FC 5034, FC 5035 Migrated Tower SPD Expansion Unit Card Position Table

Bus Number (BBBB in DSA / logical address)	Card number (Cc in DSA / logical address)	Item DSA Points to	Position label
0005	01	IOP	S01
	02	IOP	S02
	03	IOP	S03
	04	IOP	S04
	05	IOP	S05
	06	IOP	S06

Bus PIPs

Table 6. FC 5065, FC 5066 Expansion Tower Card Position Table

Bus Number (BBBB in DSA / logical address)	Card number (Cc in DSA / logical address)	Item DSA Points to	Position label
xxxx where xxxx = 0005 through 0017 hexadecimal or 5 through 23 decimal	01	IOA	C01
		IOA	C02
		IOP	C03
		IOA	C04
		IOA	C05
	02	IOA	C06
		IOA	C07
		IOP	C08
		IOA	C09
		IOA	C10
	03	IOA	C11
		IOA	C12
		IOP	C13
		IOA	C14
		IOA	C15

Table 7. FC 5070, 5071, 5072, 5073 Expansion Tower Card Position Table

Bus Number (BBBB in DSA / logical address)	Card number (Cc in DSA / logical address)	Item DSA Points to	Position label
xxxx where xxxx = 0005 through 0017 hexadecimal or 5 through 23 decimal	01	IOP	02
	02	IOP	03
	03	IOP	04
	04	IOP	05
	05	IOP	06
	06	IOP	07
	07	IOP	08
	08	IOP	09
	09	IOP	10
	0A	IOP	11
	0B	IOP	12
	0C	IOP	13
	0D	IOP	14

Table 8. FC 5077 Migrated Tower Card Position Table

Bus Number (BBBB in DSA / logical address)	Card number (Cc in DSA / logical address)	Item DSA Points to	Position label
0004	01	IOP	S02–S03
	02	IOP	S04
	04	IOP	S05
	05	IOP	S06

Table 9. FC 5080, 5081, 5082, 5083 Expansion Tower Card Position Table

Bus Number (BBBB in DSA / logical address)	Card number (Cc in DSA / logical address)	Item DSA Points to	Position label
xxxx where xxxx = 0005 through 0017 hexadecimal or 5 through 23 decimal	01	IOP	03
	02	IOP	04

BUS-PIP Entry Point

Introduction:: This procedure is the entry point into this document when you have been sent to a BUS-PIP for isolation of a problem in an SPD Migrated I/O Tower.

Use the migrated I/O tower feature code and the following table to determine where to go in this document.

Table 10. BUS-PIP Entry Point Table:

BUS-PIP that you were sent here to perform:	Migrated I/O Tower Feature Code	Go To This PIP (in this document)
BUS-PIP1	FC 5033, FC 5034, FC 5035	Go to “BUS-PIP1 (503x)” on page 238.
	FC 5077	Go to “BUS-PIP1 (5077)” on page 244.
BUS-PIP2	FC 5033, FC 5034, FC 5035	Go to “BUS-PIP2 (503x)” on page 252.
	FC 5077	Go to “BUS-PIP2 (5077)” on page 254.
BUS-PIP3	All	Go to “BUS-PIP3” on page 257.
BUS-PIP5	All	Go to “BUS-PIP5” on page 265.
BUS-PIP6	FC 5033, FC 5034, FC 5035	Go to “BUS-PIP6 (503x)” on page 269.
	FC 5077	Go to “BUS-PIP6 (5077)” on page 280.
BUS-PIP7	All	Go to “BUS-PIP7” on page 291.
BUS-PIP8	All	Go to “BUS-PIP8” on page 294.

Bus PIPs

Table 10. BUS-PIP Entry Point Table: (continued)

BUS-PIP that you were sent here to perform:	Migrated I/O Tower Feature Code	Go To This PIP (in this document)
BUS-PIP9	All	Go to "BUS-PIP9" on page 297.
BUS-PIP10	All	Go to "BUS-PIP10" on page 301.
BUS-PIP11	All	Go to "BUS-PIP11" on page 305.

BUS-PIP1 (503x)

Introduction: BUS-PIP1 (503x) describes how to isolate a problem on a system SPD bus.

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

Refer to the "Overview" on page 232 for a list of Attentions, Dangers and understanding the SRC.

1. Is there an SRC in function 5 on the system control panel?

Yes No

↓ Go to step 3 of this procedure.

2. Have you been sent here by a power procedure?

Yes No

↓ Use the SRC in function 5 and go to "Chapter 2. Unit Reference Codes" on page 17.

3. Were you sent here by a power SRC (1xxx xxxx)?

No Yes

↓ Go to "BUS-PIP2 (503x)" on page 252.

4. Does the system have multiple logical partitions?

Yes No

↓ Go to step 12 on page 239 of this procedure.

5. Perform the service actions from the Primary partition. Is there an SRC on the system control panel?

No Yes

- ↓ Go to step 13 of this procedure.
- 6. From the SST or DST *Work with Partition Status* screen, examine the logical partition where the problem was reported. Is the logical partition's state "Failed" on the *Work with Partition Status* screen?
 - No Yes**
 - ↓ Go to step 8 of this procedure.
- 7. Is the failing partition's console functional?
 - No Yes**
 - ↓ Go to the console of the logical partition where the problem was reported. Perform the services actions from that secondary partition. (See *AS/400 Service Functions* for help in locating the console of the logical partition.)
 - Go to step 19 on page 240 of this procedure.
- 8. Perform the following:
 - a. Power off the logical partition. See *AS/400 Service Functions*.
 - b. Select Manual mode for the logical partition. See *AS/400 Service Functions*.
 - c. Power on the logical partition. See *AS/400 Service Functions*.
- 9. Is the logical partition's state "Failed" on the *Work with Partition Status* screen?
 - No Yes**
 - ↓ Go to step 11 of this procedure.
- 10. Is the failing partition's console functional?
 - No Yes**
 - ↓ Go to the console of the logical partition where the problem was reported. Perform the service actions from that logical partition. (See *AS/400 Service Functions* for help in locating the console of the logical partition.)
 - Go to step 18 on page 240 of this procedure.
- 11. Remain at the console of the Primary partition. Perform the service actions from the Primary partition.
 - Go to step 19 on page 240 of this procedure.
- 12. Does an SRC appear on the control panel?
 - Yes No**
 - ↓ Go to step 19 of this procedure.
- 13. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
- 14. Verify the I/O bus SRC by performing the following:
 - a. Select Manual mode on the control panel.
 - b. Power on the system.
- 15. Does an SRC appear on the control panel?
 - Yes No**
 - ↓ Go to step 18 of this procedure.
- 16. Is the SRC B600 69xx?
 - Yes No**
 - ↓ Go to step 41 of this procedure.

Bus PIPs

17. Perform the following:
 - a. Select control panel function 13.
 - b. Record the first 6 digits of SRC word 7 (function 13, digits 9-16). This is the direct select address.

Note: The first 4 characters of the direct select address are the bus number. The fifth and sixth characters are the card address.

Go to step 34 of this procedure.

18. Does the IPL complete successfully to the *IPL or Install the System* display?

Yes **No**

↓ Go to step 27 of this procedure.

19. Use the full-authority password to sign on to DST.

Search the Service Action and Product Activity Logs (see “Using the Service Action Log” on page 12 and “Using the Product Activity Log” on page 11) for one of the following SRCs that **occurred during the last IPL:**

B600 6901	B600 69D0	B600 69E8
B600 6902	B600 69D8	B600 69F0
B600 6905	B600 69E0	B600 69F8
B600 69B8		

Note: Perform one of the following to assist in the search for a specific SRC:

- Enter the specific SRCs in the *Reference code* field on the Select Analysis Report Options display.
- Use the Sort by function key to display specific SRC entries.

Did you find one of the SRCs listed, **and** did it occur during the last IPL?

No **Yes**

↓ Record the bus number from the product activity log. Then go to “BUS-PIP6 (503x)” on page 269.

Note: If the bus number is not available, select F4 (Additional information) from the Display Detail Report for Resource display. Record the first 6 digits of SRC word 7 (function 13, digits 9-16)

This ends the procedure.

20. Search the Service Action and Product Activity logs (see “Using the Service Action Log” on page 12 and “Using the Product Activity Log” on page 11) for the following SRCs: • B600 69C1 • B600 69C5

Note: Perform one of the following to assist in the search for a specific SRC:

- Enter the specific SRCs in the *Reference code* field on the Select Analysis Report Options display.
- Use the Sort by function key to display specific SRC entries.

Did you find either one of the SRCs?

No **Yes**

- ↓ Record the bus number and card position from the product activity log. Then go to “BUS-PIP7” on page 291.

This ends the procedure.

21. Use the hardware service manager function to search for missing or failed bus resources.

Are there I/O processor cards listed with a status other than “operational”?

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

Yes No

- ↓ Press the F16 key to return to the Use Dedicated Service Tools (DST) display.

Go to step 31 of this procedure.

22. Is only one I/O processor “not operational”?

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

Yes No

- ↓ Go to step 26 of this procedure.

23. Use the packaging resource information in the hardware service manager function to determine the card position of the I/O processor.

- If the I/O processor card is located in an expansion tower, then power off the expansion tower and exchange the I/O processor card. See “Expansion Tower Power Procedure” on page 871.
- If the I/O processor card is located in the SPD migrated tower, then power off the system and exchange the I/O processor card. See “Powering Off the System” on page 868.

24. Power on the expansion tower or SPD migrated tower where the I/O processor card is located and return to the hardware service manager function. Is the status of the I/O processor card operational?

No Yes

- ↓ You have corrected the problem. Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

25. Perform the following:

- a. Power off the system or expansion tower where the I/O processor card is located.
- b. Remove the I/O processor card you installed in step 23 of this procedure.
- c. Reinstall the original I/O processor card.
- d. Power on the system or expansion tower where the I/O processor card is located..

26. Use the hardware service manager function to record information about the bus:

Find the “non-operational” I/O processor card that has the lowest card address. Record the card address, bus number, board number, frame ID, and card position.

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

Bus PIPs

Use the following table to determine your next action.

Table 11. Bus Isolation Procedures for a Non-Operational I/O Processor

Bus	Board	Action
Any	1	<ul style="list-style-type: none"> An unsupported bus extension unit failed. This indicates a Licensed Internal Code problem. Ask your next level of support for assistance.
4	0	<ul style="list-style-type: none"> Bus 1 failed. Perform "BUS-PIP2 (503x)" on page 252.
5	0	<ul style="list-style-type: none"> Expansion unit failed. Perform "BUS-PIP4" on page 262.
6-9	0	<p>An optically connected bus failed.</p> <ol style="list-style-type: none"> If only one I/O processor is not operational and you know the card position of the IOP then perform "BUS-PIP5" on page 265 for the I/O processor. If "BUS-PIP5" on page 265 does not identify the failing item, return here and continue with the next step in this table. If the expansion tower is FC 507x or FC 508x, perform "BUS-PIP3" on page 257. If the expansion tower is FC 5044, perform "BUS-PIP9" on page 297. If the expansion tower is FC 5065, perform "BUS-PIP10" on page 301. Otherwise perform "BUS-PIP6 (503x)" on page 269.

This ends the procedure.

27. Does the Disk Configuration Error Report display or the Disk Configuration Warning Report display appear on the console?

No **Yes**

↓ Record all B600 xxxx entries (they may be related to the problem).

Go to step 30 of this procedure.

28. Does the Display Failing System Bus display appear on the console?

Yes **No**

↓ A different error occurred. Go to "Starting Point For All Problems" on page 3 to correct the problem.

This ends the procedure.

29. Record the failing system buses that are listed on the Display Failing System Bus display. You will need these bus numbers later in these procedures.
30. Press the Enter key.
The Use Dedicated Service Tools (DST) display appears.
31. Use the full-authority password to sign on to DST.

Search the Service Action and Product Activity Logs for the SRC that sent you to this procedure (see “Using the Service Action Log” on page 12 and “Using the Product Activity Log” on page 11).

Notes:

- a. Search only for SRCs that occurred during the last IPL. You may ignore informational and statistical log entries.
- b. For multiple entries of the SRC that sent you to this procedure, select the entry with the lowest card-logical address (direct select address).
- c. Perform one of the following to assist in the search for a specific SRC:
 - Enter the specific SRCs in the *Reference code* field on the Select Analysis Report Options display.
 - Use the Sort by function key to display specific SRC entries.

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

Yes No

- ↓ The problem appears to be intermittent. Check the service action and product activity logs for B600 xxxx SRCs (see “Using the Service Action Log” on page 12 and “Using the Product Activity Log” on page 11). If the B600 xxxx SRCs identify the same I/O processor, this I/O processor may be failing. Use this information to assist in problem analysis. Ask your next level of support for assistance.

This ends the procedure.

32. Is the SRC that sent you to this procedure B600 xxxx?

Yes No

- ↓ Go to step 41 of this procedure.

33. From the product activity log information, record the bus number, card position, frame ID, and board number.

Note: If the bus number is blank, select F4 (Additional information) from the Display Detail Report for Resource display. Record the first 6 digits of SRC word 7.

34. Is the SRC that sent you to this procedure B600 6920 or B600 6937?

No Yes

- ↓ This indicates a Licensed Internal Code problem. Ask your next level of support for assistance.

This ends the procedure.

35. Is the SRC that sent you to this procedure one of the following?

- B600 6901
- B600 6902
- B600 6905
- B600 69B8
- B600 69D0
- B600 69D8
- B600 69E0
- B600 69E8
- B600 69F0
- B600 69F8

Bus PIPs

No Yes

↓ Go to "BUS-PIP6 (503x)" on page 269.

This ends the procedure.

36. Is the SRC that sent you to this procedure B600 69C1 or B600 69C5?

No Yes

↓ Go to "BUS-PIP7" on page 291.

This ends the procedure.

37. Is the SRC that sent you to this procedure B600 69xx?

Yes No

↓ **Any system bus 4 through 22 failed. Record the SRC and use it as the Entry Point SRC or error in the bus isolation procedure.**

Go to step 41.

38. Is the direct select address 0004xx, or is the bus number system SPD bus 4?

Yes No

↓ Go to "BUS-PIP2 (503x)" on page 252.

This ends the procedure.

39. Is the direct select address 0005xx, or is the bus number system SPD bus 5?

Yes No

↓ Go to step 43 of this procedure.

40. Go to "BUS-PIP4" on page 262.

This ends the procedure.

41. Is the SRC that sent you to this procedure B1xx xxxx, C1xx xxxx, or D1xx xxxx?

Yes No

↓ A different SRC occurred.

Go to "Chapter 2. Unit Reference Codes" on page 17.

This ends the procedure.

42. System SPD bus 4 failed.

Record the SRC and use it as the Entry Point SRC or error in the bus isolation procedure.

Go to "BUS-PIP2 (503x)" on page 252.

This ends the procedure.

43. Is the expansion tower for the failing bus FC 5044?

No Yes

↓ Go to "BUS-PIP9" on page 297.

This ends the procedure.

44. Go to "BUS-PIP3" on page 257.

This ends the procedure.

BUS-PIP1 (5077)

Introduction: BUS-PIP1 (5077) describes how to isolate a problem on a system SPD bus.

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

This procedure will indicate the logical partition in which you are to perform service. Whenever the service actions in this procedure move from one logical partition to a different logical partition this procedure will indicate which logical partition to perform service in.

Refer to the “Overview” on page 232 for a list of Attentions, Dangers and understanding the SRC.

1. Is there an SRC in function 5 of the system control panel?

Yes No

↓ Go to step 3.

2. Have you been sent here by a power procedure?

Yes No

↓ Use the SRC in function 5 and go to “Chapter 2. Unit Reference Codes” on page 17.

This ends the procedure.

3. Were you sent here by a Power SRC (1xxx xxxx)?

No Yes

↓ Go to “BUS-PIP2 (5077)” on page 254.

4. Does the system have logical partitions?

Yes No

↓ Go to step 12 on page 246 of this procedure.

5. Perform the service actions from the Primary partition. Is there an SRC on the system control panel?

No Yes

↓ Go to step 13 on page 246 of this procedure.

6. From Start a Servic Tool (SST) or Dedicated Service Tool (DST) *Work with Partition Status* screen, examine the logical partition where the problem was reported. Is the logical partition’s state “Failed” on the *Work with Partition Status* screen?

No Yes

↓ Go to step 8 on page 246 of this procedure.

7. Is the failing partition’s console functional?

Bus PIPs

No **Yes**

↓ Go to the console of the logical partition where the problem was reported. Perform the service actions from that secondary partition. (See *AS/400 Service Functions* for help in locating the console of the logical partition.)

Go to step 19 on page 247 of this procedure.

8. Perform the following:

- a. Power off the logical partition. See *AS/400 Service Functions*.
- b. Select Manual mode for the logical partition. See *AS/400 Service Functions*.
- c. Power on the logical partition. See *AS/400 Service Functions*.

9. Is the logical partition's state "Failed" on the *Work with Partition Status* screen?

No **Yes**

↓ Go to step 11 of this procedure.

10. Is the failing partition's console functional?

No **Yes**

↓ Go to the console of the logical partition where the problem was reported. Perform the service actions from that logical partition. (See *AS/400 Service Functions* for help in locating the console of the logical partition.)

Go to step 18 on page 247 of this procedure.

11. Remain at the console of the Primary partition. Perform the service actions from the Primary partition.

Go to step 19 on page 247 of this procedure.

12. Does an SRC appear on the control panel?

Yes **No**

↓ Go to step 19 on page 247 of this procedure.

13. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).

14. Verify the I/O bus SRC by performing the following:

- a. Select Manual mode on the control panel.
- b. Power on the system.

15. Does an SRC appear on the control panel?

Yes **No**

↓ Go to step 18 of this procedure.

16. Is the SRC B600 69xx?

Yes **No**

↓ Go to step 40 of this procedure.

17. Perform the following:

- a. Select control panel function 13.
- b. Record the first 6 digits of SRC word 7 (function 13, digits 9-16). This is the direct select address.

Note: The first 4 characters of the direct select address are the bus number. The fifth and sixth characters are the card address.

Go to step 34 of this procedure.

18. Does the IPL complete successfully to the IPL or Install the System display?

Yes No

↓ Go to step 27 of this procedure.

19. Use the full-authority password to sign on to DST.

Search the Service Action and Product Activity Logs (see “Using the Service Action Log” on page 12 and “Using the Product Activity Log” on page 11) for one of the following SRCs that **occurred during the last IPL**:

B600 6901	B600 69E0
B600 6902	B600 69E8
B600 6905	B600 69F0
B600 69B8	B600 69F8
B600 69D0	
B600 69D8	

Note: Perform one of the following to assist in the search for a specific SRC:

- Enter the specific SRCs in the *Reference code* field on the Select Analysis Report Options display.
- Use the Sort by function key to display specific SRC entries.

Did you find one of the SRCs listed, **and** did it occur during the last IPL?

No Yes

↓ Record the bus number from the Product Activity Log. Then go to “BUS-PIP6 (5077)” on page 280.

Note: If the bus number is not available, select F4 (Additional information) from the Display Detail Report for Resource display. Record the first 6 digits of SRC word 7 (function 13, digits 9-16).

This ends the procedure.

20. Search the Service Action and Product Activity Logs (see “Using the Service Action Log” on page 12 and “Using the Product Activity Log” on page 11) for the following SRCs: • B600 69C1; • B600 69C5

Note: Perform one of the following to assist in the search for a specific SRC:

- Enter the specific SRCs in the *Reference code* field on the Select Analysis Report Options display.
- Use the Sort by function key to display specific SRC entries.

Did you find either one of the SRCs?

No Yes

↓ Record the bus number and card position from the Product Activity Log. Then go to “BUS-PIP7” on page 291.

This ends the procedure.

21. Use the hardware service manager function to search for missing or failed bus resources.

Are there I/O processor cards listed with a status other than operational?

Bus PIPs

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

Yes **No**

↓ Press the F16 key to return to the Use Dedicated Service Tools (DST) display.

Go to step 31 of this procedure.

22. Is only one I/O processor not operational?

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

Yes **No**

↓ Go to step 26 of this procedure.

23. Use the packaging resource information in the hardware service manager function to determine the card position of the I/O processor.

If the I/O processor card is located in an expansion tower, then power off the expansion tower and exchange the I/O processor card. See "Expansion Tower Power Procedure" on page 871.

If the I/O processor is located in the SPD migrated tower, then power off the system and exchange the I/O processor card. See "Powering Off the System" on page 868.

24. Power on the expansion tower or SPD migrated tower where the I/O processor card is located.

Is the status of the I/O processor card operational?

No **Yes**

↓ You have corrected the problem. Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

25. Perform the following:

- a. Power off the system or expansion tower where the I/O processor card is located.
- b. Remove the I/O processor card you installed in step 23 of this procedure.
- c. Reinstall the original I/O processor card.
- d. Power on the system or expansion tower where the I/O processor card is located.

26. Use the hardware service manager function to record information about the bus:

Find the non-operational I/O processor card that has the lowest card address. Record the card address, bus number, board number, frame ID, and card position.

Note: Ignore any I/O processor card with a status of *not connected*.

Use the following table to determine your next action.

Table 12. Bus Isolation Procedures for a Non-Operational I/O Processor

Bus	Board	Action
Any	1	An unsupported bus extension unit failed. This indicates a Licensed Internal Code problem. Ask your next level of support for assistance.
4	0	Bus 1 failed. Perform "BUS-PIP2 (5077)" on page 254.
5-22	0	An optically connected bus failed. a. If only one I/O processor is not operational and you know the card position of the IOP then perform "BUS-PIP5" on page 265 for the I/O processor. If "BUS-PIP5" on page 265 does not identify the failing item, return here and continue with the next step in this table. b. If the expansion tower is FC 507x or FC 508x, perform "BUS-PIP3" on page 257. c. If the expansion tower is FC 5044, perform "BUS-PIP9" on page 297. d. If the expansion tower is FC 5065, perform "BUS-PIP10" on page 301. e. Otherwise perform "BUS-PIP6 (5077)" on page 280.

This ends the procedure.

27. Does the Disk Configuration Error Report display or the Disk Configuration Warning Report display appear on the console?

No Yes

↓ Record all B600 xxxx entries (they may be related to the problem).
 Go to step 30 of this procedure.

28. Does the Display Failing System Bus display appear on the console?

Yes No

↓ A different error occurred. Go to "Starting Point For All Problems" on page 3 to correct the problem.

Bus PIPs

This ends the procedure.

29. Record the failing system buses that are listed on the Display Failing System Bus display. You will need these bus numbers later in these procedures.
30. Press the Enter key.
The Use Dedicated Service Tools (DST) display appears.
31. Use the full-authority password to sign on to DST.
Search the Service Action and Product Activity Logs for the SRC that sent you to this procedure (see "Using the Service Action Log" on page 12 and "Using the Product Activity Log" on page 11).

Notes:

- a. Search only for SRCs that occurred during the last IPL. You may ignore informational and statistical log entries.
- b. For multiple entries of the SRC that sent you to this procedure, select the entry with the lowest card logical address (direct select address).
- c. Perform one of the following to assist in the search for a specific SRC:
 - Enter the specific SRCs in the *Reference code* field on the Select Analysis Report Options display.
 - Use the Sort by function key to display specific SRC entries.

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

Yes **No**

- ↓ The problem appears to be intermittent. Check the service action and Product Activity Logs for B600 xxxx SRCs (see "Using the Service Action Log" on page 12 and "Using the Product Activity Log" on page 11). If the B600 xxxx SRCs identify the same I/O processor, this I/O processor may be failing. Use this information to assist in problem analysis. Ask your next level of support for assistance.

This ends the procedure.

32. Is the SRC that sent you to this procedure B600 xxxx?

Yes **No**

- ↓ Go to step 40 of this procedure.

33. From the Product Activity Log information, record the bus number, card position, frame ID, and board number.

Note: If the bus number is blank, select F4 (Additional information) from the Display Detail Report for Resource display. Record the first 6 digits of SRC word 7.

34. Is the SRC that sent you to this procedure B600 6920 or B600 6937?

No **Yes**

- ↓ This indicates a Licensed Internal Code problem. Ask your next level of support for assistance.

This ends the procedure.

35. Is the SRC that sent you to this procedure one of the following?
 - B600 6901
 - B600 6902
 - B600 6905
 - B600 69B8

- B600 69D0
- B600 69D8
- B600 69E0
- B600 69E8
- B600 69F0
- B600 69F8

No Yes

↓ Go to “BUS-PIP6 (5077)” on page 280.

This ends the procedure.

36. Is the SRC that sent you to this procedure B600 69C1 or B600 69C5?

No Yes

↓ Go to “BUS-PIP7” on page 291.

This ends the procedure.

37. Is the SRC that sent you to this procedure B600 69xx?

Yes No

↓ Any system bus 4 through 22 failed. Record the SRC and use it as the Entry Point SRC or error in the bus isolation procedure. Go to step 40 of this procedure.

38. Is the direct select address 0004xx, or is the bus number system SPD bus 4?

Yes No

↓ Go to step 42 of this procedure.

39. Go to “BUS-PIP2 (5077)” on page 254.

This ends the procedure.

40. Is the SRC that sent you to this procedure B1xx xxxx, C1xx xxxx, or D1xx xxxx?

Yes No

↓ A different SRC occurred.

Go to Chapter 2 (Unit Reference Codes) of the Problem Analysis book that sent you here.

This ends the procedure.

41. System SPD bus 4 failed.

Record the SRC and use it as the Entry Point SRC or error in the bus isolation procedure.

Go to “BUS-PIP2 (5077)” on page 254.

This ends the procedure.

42. Is the expansion tower for the failing bus FC 5044?

No Yes

↓ Go to “BUS-PIP9” on page 297.

This ends the procedure.

43. Go to “BUS-PIP3” on page 257.

This ends the procedure.

BUS-PIP2 (503x)

Introduction: This procedure isolates a solid failure on system SPD bus 4 in the SPD migrated tower. Throughout this procedure, use the system configuration list to verify the configuration information.

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: For this procedure you must perform service in the logical partition which owns the bus on this SPD migrated tower. If you came to this procedure while working in another logical partition, then move to the console of the logical partition which owns this bus and perform this procedure from there.

Refer to the “Overview” on page 232 for a list of Attentions, Dangers and understanding the SRC.

1. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
Check the power cables to ensure that they are connected and seated correctly.
Disconnect the cards in positions C01 through C11 (if installed).
2. Power on the system.

Note: Ignore any system configuration or console not found errors that appear during the IPL sequence.

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

No **Yes**

↓ Go to step 6 of this procedure and perform steps 6a on page 253, 6d on page 253, 6e on page 253 and continue with step 7 on page 253.

3. Perform the following:
 - a. Power off the system (before installing each card).
 - b. Install the cards you removed in step 1 of this procedure, one at a time in the order that is shown below.
 - c. Power on the system after you install each card.

Card Position:

C11
C09
C10
C08
C07
C06
C05
C04

C03

C02

C01

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

Yes **No**

↓ Repeat this step until the SRC or failure that sent you to this procedure occurs.

If the error does not occur, the problem may be intermittent. Ask your next level of support for assistance.

This ends the procedure.

4. Perform the following:
 - a. Power off the system.
 - b. Exchange the last card you reinstalled (see “Chapter 4. Removal and Installation Procedures” on page 593).
 - c. Power on the system.
5. Does the Entry Point SRC or error occur?

Yes **No**

↓ The card you just exchanged is the failing item.

Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

6. Perform the following:
 - a. Power off the system.
 - b. Remove the card you just exchanged.
 - c. Install the original card.
 - d. Exchange BACKPL2 (see “Type, Model, and Part Number List” on page 750).
 - e. Power on the system.

Notes:

- a. Ignore any system configuration errors that may appear during the IPL sequence.

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

Yes **No**

↓ You have corrected the problem.

Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

7. Perform the following:
 - a. Power off the system.
 - b. Remove the BACKPL2 FRU you just exchanged and install the original.
 - c. Reconnect all cards and cables you disconnected during this procedure.
 - d. Power on the system.
 - e. You have exchanged or eliminated all the I/O bus parts.
Ask your next level of support for assistance.
8. **This ends the procedure.**

BUS-PIP2 (5077)

Introduction: This procedure isolates a solid failure in the migrated tower on SPD bus 4. Throughout this procedure, use the system configuration list to verify the configuration information.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

For this procedure you must perform service in the logical partition which owns the bus on this SPD migrated tower. If you came to this procedure while working in another logical partition, then move to the console of the logical partition which owns this bus and perform this procedure from there.

Refer to the “Overview” on page 232 for a list of Attentions, Dangers and understanding the SRC.

1. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
Check the power cables to ensure that they are connected and seated correctly.
2. Disconnect the cards at the following card positions (if installed) by sliding them partially out of the card enclosure.

Note: Do not remove the card in position S09.

Table 13. Card Positions—Removal

S01, S04, S05, S06, S07, S10, S15, S16
--

3. Power on the system.
Does the SRC or error that sent you to this procedure occur?
Yes No
↓ Go to step 14 of this procedure.

4. Does the CFIOP in S02 & S03 have adapter cards attached?
No Yes
↓ Go to “BUS-PIP5” on page 265.

Note: If BUS-PIP5 does not identify the failing item, return here and continue with the next step of this procedure.

5. Perform the following:
 - a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Remove the CFIOP in S02 & S03 card and install a new CFIOP card (see “Chapter 4. Removal and Installation Procedures” on page 593).
 - c. Power on the system.
Does the SRC or error that sent you to this procedure occur?

Yes No

↓ The failing item is the CFIOIP card, that you have already exchanged. Reconnect any I/O adapters that you removed if you performed BUS-PIP5.

Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

6. Power off the system.

Remove the CFIOIP card you installed in the previous step of this procedure. Install the original CFIOIP card (and the attached I/O adapters).

7. Remove the interposer card in position S08.

Install a new interposer card and power on the system.

Does the SRC or error that sent you to this procedure occur?

Yes No

↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

8. Power off the system and remove the interposer card you just installed.

Install the original interposer card.

9. Remove the local bus expansion adapter in card position S09.

Install a new local bus expansion adapter card (move the attached SPD optical bus driver or air flow cards to the new local bus expansion adapter) and power on the system.

Does the SRC or error that sent you to this procedure occur?

Yes No

↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

10. Power off the system and remove the local bus expansion adapter card you just installed.

Install the original local bus expansion adapter card and either the the attached SPD optical bus driver or the air flow cards.

11. Go to the unit reference code table for this SRC (see "Chapter 2. Unit Reference Codes" on page 17) and exchange the remaining items in the Failing Item column.

Then return here and continue with the next step of this procedure.

12. Power on the system.

Does the SRC or error that sent you to this procedure occur?

Yes No

↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

13. The only failing item remaining in the system unit is the card enclosure.

Perform the following:

a. Exchange the system unit card enclosure.

b. Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

14. Perform the following:

Bus PIPs

- a. Power off the system (before installing each card).
- b. Install the cards you removed in step 2 of this procedure one at a time in the order that is shown in Table 14.
- c. Power on the system after you install each card.

Table 14. Card Positions

S01, Regulator
S15, Regulator
S16, Regulator
S04, I/O Processor
S05, I/O Processor
S06, I/O Processor
S07, Local Bus Adapter
S10, Local Bus Adapter

Does the SRC or error that sent you to this procedure occur?

Yes **No**

- ↓ Repeat this step until one of the following occurs:
- The SRC or failure that sent you to this procedure appears.
 - You have installed all the cards that were removed in step 2 of this procedure.
 - A different SRC appears. Go to the unit reference code table for this SRC (see “Chapter 2. Unit Reference Codes” on page 17).

This ends the procedure.

- An error does not appear. The problem may be intermittent. Ask your next level of support for assistance.

This ends the procedure.

15. Perform “BUS-PIP5” on page 265 for the last card you reinstalled in step 14 of this procedure.

Note: If BUS-PIP5 does not identify the failing item, return here and continue with the next step of this procedure.

16. Power off the system.
Exchange the last I/O processor card you reinstalled in step 14 of this procedure.
Power on the system.

Does the SRC or error that sent you to this procedure occur?

Yes **No**

- ↓ The failing item is the I/O processor card you already exchanged.
Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

17. Perform the following:
 - a. Power off the system.
 - b. Remove the I/O processor card you just exchanged.
 - c. Check the backplane for bent or broken pins.

- d. Install the original I/O processor card and the attached I/O adapter cards.
- 18. Did you reinstall only one I/O processor card that is listed in Table 14 on page 256 before the Entry Point SRC or error occurred again?

No Yes

↓ Go to step 21 of this procedure.

- 19. Perform the following:
 - a. Exchange the remaining I/O processors that are listed in Table 14 on page 256, one at a time.
 - b. Power on the system after installing each card.

Does the SRC or error that sent you to this procedure occur?

Yes No

↓ The failing item is the I/O processor card that you just exchanged. Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

- 20. Perform the following:
 - a. Power off the system.
 - b. Remove the I/O processor card you installed in the previous step.
 - c. Install the original I/O processor card.

- 21. The only failing item remaining is the system unit card enclosure.

Perform the following:

- a. Exchange the system unit card enclosure.
- b. Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

BUS-PIP3

Introduction: This procedure isolates a solid failure in the FC 507x or FC 508x Storage Expansion Towers.

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

For this procedure you must perform service in the logical partition which owns the bus on this expansion tower. If you came to this procedure while working in another logical partition, then move to the console of the logical partition which owns this bus and perform this procedure from there.

To determine which logical partition owns the bus or to locate the console of a secondary partition see *AS/400 Service Functions*.

Refer to the “Overview” on page 232 for a list of Attentions, Dangers and understanding the SRC.

Bus PIPs

1. Power off the expansion tower. (See “Expansion Tower Power Procedure” on page 871).
Attention: Verify that the expansion tower power indicator is off before you continue to the next step of this procedure. If the power indicator remains on, you may be working on a system that has OS/400–OptiConnect hardware. You may need to power off more than one system unit during this procedure.
2. Disconnect the cards at the following card positions (if installed) by sliding them partially out of the card enclosure:

Note: Do not remove the optical bus receiver card in position 1, the I/O card in position 2, or the air flow cards.

Table 15. Card Positions

FC 507x	FC 508x
3 through 14	4

Use the system configuration list to verify the configuration as you work.

3. Did you remove any cards in the previous step?
No Yes
↓ Go to step 7 of this procedure.
4. Air flow cards are installed in the positions that are shown in Table 15.
Is there an I/O processor card (not an air flow card) that is installed in the first position on the bus? (Position 2 for FC 507x and position 3 for FC 508x.)
No Yes
↓ Go to step 8 of this procedure.
5. Check the printed system configuration list to determine if I/O processors are supposed to be on this bus.
Are I/O processors missing?
Yes No
↓ If the Entry Point SRC was B600 6944, this indicates that there is an empty bus and the message can be ignored. If the Entry Point SRC was not B600 6944, ask your next level of support for assistance.
This ends the procedure.
6. Ask your next level of support for assistance.
This ends the procedure.
7. Power on the expansion tower. (See “Expansion Tower Power Procedure” on page 871.)
Does the Entry Point SRC or error occur?
Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.
Yes No
↓ Go to step 14 of this procedure.
8. Perform the following:
 - a. Power off the expansion tower. (See “Expansion Tower Power Procedure” on page 871.)

- b. Remove the optical bus receiver and install a new optical bus receiver of the same type (see “Chapter 4. Removal and Installation Procedures” on page 593).
- c. Power on the expansion tower. (See “Expansion Tower Power Procedure” on page 871.)

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ The failing item is the optical bus receiver card, which you have already exchanged.

Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

- 9. Remove the optical bus receiver you installed in the previous step and install the original optical bus receiver.
- 10. Perform “BUS-PIP5” on page 265 for the following cards:

Table 16. Card Positions

FC 507x	FC 508x
3 through 14	4

If BUS-PIP5 does not identify the failing item, return here and continue with the next step of this procedure.

- 11. Perform the following:
 - a. Power off the expansion tower. (See “Expansion Tower Power Procedure” on page 871.)
 - b. Exchange the I/O processor in the position that is shown in Table 16
 - c. Power on the expansion tower. (See “Expansion Tower Power Procedure” on page 871.)

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ The failing unit is the I/O processor card, which you have already exchanged.

Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

- 12. Power off the expansion tower. (See “Expansion Tower Power Procedure” on page 871.)
Remove the I/O processor you installed in step 11 of this procedure and install the original I/O processor card and the attached adapter cards.
- 13. The only failing item remaining in the expansion tower is the card enclosure.

Bus PIPs

Perform the following:

- a. Exchange the expansion tower card enclosure.
- b. Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

14. Install the cards you removed in step 2 of this procedure one at a time in the order that is shown in Table 17.

Note: Power off the expansion tower before installing each card. After you install each card, power on the expansion tower.

Table 17. Install Order

FC 507x	FC 508x
3	4
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ Repeat this step until the SRC or failure that sent you to this procedure occurs.

If the error does not occur, the problem may be intermittent. Ask your next level of support for assistance.

This ends the procedure.

15. Perform "BUS-PIP5" on page 265 for the last card you reinstalled in step 14 of this procedure.

Note: If BUS-PIP5 does not identify the failing item, return here and continue with the next step of this procedure.

16. Perform the following:
 - a. Power off the expansion tower. (See "Expansion Tower Power Procedure" on page 871.)
 - b. Exchange the I/O processor card you last reinstalled in step 14 of this procedure with a new I/O processor card of the same type.

- c. Power on the expansion tower. (See “Expansion Tower Power Procedure” on page 871.)

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

- ↓ The failing item is the I/O processor card, which you have just exchanged.

Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

- 17. Perform the following:
 - a. Power off the expansion tower. (See “Expansion Tower Power Procedure” on page 871.)
 - b. Remove the last card that you exchanged.
 - c. Install the original I/O processor card and the attached adapter cards.
- 18. Perform the following:
 - a. Use the Table 17 on page 260 and the I/O processor card with the position that is one less than the I/O processor card you are working with.
 - b. Exchange this I/O processor card.
 - c. Power on the expansion tower. (See “Expansion Tower Power Procedure” on page 871.)

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

- ↓ The failing item is the I/O processor card, which you have already exchanged.

Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

- 19. Perform the following:
 - a. Power off the expansion tower. (See “Expansion Tower Power Procedure” on page 871.)
 - b. Remove the I/O processor card you installed in the previous step.
 - c. Install the original I/O processor card.
- 20. The only failing item remaining is the expansion tower card enclosure. Perform the following:
 - a. Exchange the expansion tower card enclosure
 - b. Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

BUS-PIP4

Introduction: This procedure isolates a solid failure in the FC 503x SPD Migrated Tower.

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: For this procedure you must perform service in the logical partition which owns the bus on this SPD migrated tower. If you came to this procedure while working in another logical partition, then move to the console of the logical partition which owns this bus and perform this procedure from there.

Refer to the “Overview” on page 232 for a list of Attentions, Dangers and understanding the SRC.

1. Check the printed system configuration list to determine if I/O processors are supposed to be on this bus.

Does the Hardware Service Manager option for displaying logical resources indicate that there are fewer IOPs on this bus than the system configuration list indicates?

Yes No

↓ If the Entry Point SRC was B600 6944, this indicates that there is an empty bus and the message can be ignored.

This ends the procedure.

2. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).

Attention: Verify that the SPD migrated tower power indicator is off before you continue to the next step of this procedure.

3. In the Expansion Unit for the bus you are isolating, disconnect the cards by sliding them partially out of the card enclosure.

For SPD Expansion Units, disconnect cards in slots S01 through S06.

For PCI Expansion Units, disconnect cards in slots E01 through E20.

Use the system configuration list to verify the configuration as you work.

4. Power on the system.

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

No Yes

↓ Go to step 11 of this procedure.

5. Perform the following:

- a. Power off the system (before installing each card).
- b. Install the cards you removed in step 3 of this procedure, one at a time from lowest numeric position.
- c. Power on the system after you install each card.

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

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ Repeat this step until the SRC or failure that sent you to this procedure occurs.

If the error does not occur, the problem may be intermittent. Ask your next level of support for assistance.

This ends the procedure.

6. Is the expansion unit an SPD expansion unit?

No Yes

↓ Perform "BUS-PIP5" on page 265 for the last card you reinstalled.

Note: If BUS-PIP5 does not identify the failing item, return here and continue with the next step of this procedure.

7. Perform the following:
 - a. Power off the system.
 - b. Exchange the card you last reinstalled in step 5 of this procedure with a new card of the same type.
 - c. Power on the system.

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ The failing item is the card that you have already exchanged.
Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

8. Perform the following:
 - a. Power off the system.
 - b. Remove the last card you exchanged.
 - c. Install the original card and any attached adapter cards.
 - d. Find the card with the card position that is one less than the card you are working with.
 - e. Exchange this I/O processor card.
 - f. Power on the system.

Does the Entry Point SRC or error occur?

Bus PIPs

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ The failing item is the I/O processor card that you have already exchanged.

Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

9. Perform the following:
 - a. Power off the system.
 - b. Remove the card you installed in the previous step.
 - c. Install the original card.
 - d. Go to step 14 of this procedure.
10. Is the expansion unit an SPD expansion unit?

Yes No

↓ Go to step 14 of this procedure.
11. Is a local bus expansion adapter card, not an airflow card, installed in the first position on the bus?
 - SPD expansion unit position S07

Yes No

↓ Go to step 14 of this procedure.
12. Perform the following:
 - a. Power off the system.
 - b. Exchange the local bus expansion adapter.
 - c. Power on the system.

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ The failing item is the local bus expansion adapter card, which you have already exchanged.

Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

13. Remove the local bus expansion adapter that you installed in the previous step and install the original local bus expansion adapter.
14. The only failing item remaining is the expansion unit card enclosure. Perform the following:
 - a. Exchange the expansion unit card enclosure.
 - b. Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

BUS-PIP5

Introduction: This procedure isolates a failing I/O adapter card that is controlled by the I/O processor card. This procedure has a section for I/O adapters directly attached to the I/O processor (SPD). This procedure also has a section for I/O adapters that are attached to the backplane where the I/O processor is attached (PCI).

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If you came to this procedure from another bus isolation procedure, continue working in the same logical partition. If you did not come here from another bus isolation procedure, then move to the console of the logical partition which owns the input-output processor (IOP) on this bus.

To determine which logical partition owns the IOP or to locate the console of a secondary partition, see *AS/400 Service Functions*.

Refer to the “Overview” on page 232 for a list of Attentions, Dangers and understanding the SRC.

1. If the I/O adapter cards are SPD cards that are physically attached to the I/O processor card, perform “I/O–Direct–Attached”.
2. If the I/O adapter cards are PCI cards that are physically attached to the backplane where the I/O processor card is attached, perform “Backplane-Attached” on page 267.
3. **This ends the procedure.**

I/O–Direct–Attached:

Introduction: This procedure isolates a failing I/O adapter card that is attached to the I/O processor card.

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

1. If the I/O processor card is located in an expansion tower, then power off the expansion tower. (See “Powering On and Powering Off the System or Expansion Tower” on page 868.)
If the I/O processor card is located in the system unit or the system expansion unit, or an SPD migrated tower, then power off the system. (See “Powering On and Powering Off the System or Expansion Tower” on page 868.)
2. Disconnect the I/O processor card and check the backplane for bent or broken pins.
Are any pins damaged?

Bus PIPs

Yes No

↓ Go to step 4 of this procedure.

3. Exchange the backplane (see "Chapter 4. Removal and Installation Procedures" on page 593).

Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

4. Reconnect the I/O processor card you removed in step 2 of this procedure.
5. Does the I/O processor card have any I/O adapters attached?

Notes:

- a. To find out more about the positions of the input/output adapters (IOA) under the IOPs, see "Expansion Tower Locations and Addresses" on page 687 for the System Unit, Expansion Unit, SPD Migrated Tower, or I/O Expansion Tower where the IOP is located.
- b. The cards that are attached to the MSIOP cards (for example, types 6503 and 4700) are not I/O adapter cards.
- c. Some I/O adapters are inside the IOP. If so, the IOP must be removed to access the I/O adapter card.

Yes No

↓ The I/O processor does not have any I/O adapter cards attached to it.

Note: The I/O processor may have airflow cards installed.
Return to the procedure that sent you here.

This ends the procedure.

6. Perform the following:
 - a. Disconnect all the I/O adapters that are attached to the I/O processor card by sliding them out of the I/O adapter position.
 - b. Check the adapter connections on the I/O processor card for bent or broken pins.

Are any pins damaged?

No Yes

↓ Exchange the I/O processor card.

Reconnect all the I/O adapter cards you disconnected.

Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

- c. Power on the system or tower where the I/O processor card is located.

Does the system reference code (SRC) or failure that sent you to this procedure occur?

Note: If the system has logical partitions when looking for the entry point SRC or failure, check in the logical partition which reported the problem.

No Yes

↓ The I/O adapter cards are operational. Reconnect all the I/O adapter cards you disconnected.

Return to the procedure that sent you here.

This ends the procedure.

7. Power off the system or tower where the I/O processor card is located and perform the following:
 - a. Reconnect one of the I/O adapters you disconnected in step 6 of this procedure (starting with the bottom-most card).
 - b. Power on the system or tower.

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

Note: If the system has logical partitions, when looking for the SRC or failure, check in the logical partition which reported the problem.

Yes No

- ↓ Repeat step 7 for each I/O adapter that is attached to the I/O processor card. If you have reconnected all of the I/O adapters and no errors occur, the problem is intermittent.

This ends the procedure.

8. Power off the system or tower where the I/O processor card is located.
9. Check for bent or broken pins between the adapter card that you last inserted and the I/O processor card .

Are any pins damaged?

No Yes

- ↓ Exchange the I/O processor card.
Reconnect all the I/O adapter cards you disconnected.
Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

10. The I/O adapter card that you just installed is the failing item.
Exchange the I/O adapter card.
11. Reconnect all of the I/O adapter cards you disconnected during this procedure.
Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

Backplane-Attached:

Introduction: This procedure isolates a failing PCI I/O adapter card that is controlled by the I/O processor card.

1. If the I/O processor card is located in an expansion tower, then power off the expansion tower. (See "Powering On and Powering Off the System or Expansion Tower" on page 868.)
If the I/O processor card is located in the system unit or the system expansion unit, or an SPD migrated tower, then power off the system. (See "Powering On and Powering Off the System or Expansion Tower" on page 868.)
2. Disconnect the I/O processor card and check the connection between the I/O processor card and the backplane for damage.

Is there any damage?

Yes No

- ↓ Go to step 4 of this procedure.

Bus PIPs

3. Exchange either the damaged I/O processor or backplane (see “Chapter 4. Removal and Installation Procedures” on page 593).
Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

4. Reconnect the I/O processor card you removed in step 2 of this procedure.
5. Does the I/O processor card have any I/O adapters that it is controlling?

Note: To find out more about the positions of the IOAs under the IOPs, see “Expansion Tower Locations and Addresses” on page 687 for the System Unit, Expansion Unit, SPD Migrated Tower, or I/O Expansion Tower where the IOP is located..

Yes No

- ↓ The I/O processor is not controlling any I/O adapter cards. Return to the procedure that sent you here.

This ends the procedure.

6. Perform the following:
 - a. Disconnect all the I/O adapters that are controlled by the I/O processor card by sliding them out of the I/O adapter position.
 - b. Check the adapter connections between the backplane and the I/O adapter cards for damage.

Is there any damage?

No Yes

- ↓ Exchange either the damaged I/O adapter card or backplane. See “Chapter 4. Removal and Installation Procedures” on page 593.
Reconnect all the I/O adapter cards you disconnected.
Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

- c. Power on the system or tower where the I/O processor card is located.
Does the SRC or failure that sent you to this procedure occur?

Note: If the system has logical partitions when looking for the entry point SRC or failure, check in the logical partition which reported the problem.

No Yes

- ↓ The I/O adapter cards are operational. Reconnect all the I/O adapter cards you disconnected.
Return to the procedure that sent you here.

This ends the procedure.

7. Power off the system or tower where the I/O processor card is located and perform the following:
 - a. Reconnect one of the I/O adapters you disconnected in step 6 of this procedure.
 - b. Power on the system or tower.Does the SRC or failure that sent you to this procedure occur?

Note: If the system has logical partitions, when looking for the SRC or failure, check in the logical partition which reported the problem.

Yes No

- ↓ Repeat step 7 on page 268 for each I/O adapter that is controlled by the I/O processor card. If you have reconnected all of the I/O adapters and no errors occur, the problem is intermittent.

This ends the procedure.

8. Power off the system or tower where the I/O processor card is located.
9. Check the connection between the adapter card that you last inserted and the backplane for damage.

Is there any damage?

No Yes

- ↓ Exchange either the damaged I/O adapter card or backplane. See “Chapter 4. Removal and Installation Procedures” on page 593.
Reconnect all the I/O adapter cards you disconnected.
Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

10. The I/O adapter card that you just installed is the failing item.
Exchange the I/O adapter card.
11. Reconnect all of the I/O adapter cards you disconnected during this procedure.
Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

BUS-PIP6 (503x)

Introduction: This procedure isolates a failure in the hardware that is driving the fiber optics on an optical bus.

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If you came to this procedure from another bus isolation procedure, continue working in the same logical partition. If you did not come here from another bus isolation procedure, then move to the console of the logical partition which owns this bus.

To determine which logical partition owns the bus or to locate the console of a secondary partition, see *AS/400 Service Functions*.

Refer to the “Overview” on page 232 for a list of Attentions, Dangers and understanding the SRC.

1. Is the SRC that sent you to this procedure B600 6901?

Bus PIPs

No **Yes**

↓ The reference code indicates that the local bus expansion adapter card failed.

Power off the system and exchange the first local bus expansion adapter in the SPD migrated tower: For SPD expansion units in the SPD migrated tower, exchange the card in position S07. For PCI expansion units in the SPD migrated tower, exchange the backplane in position E00. Ensure that the attached SPD optical bus driver cards are moved to the new bus expansion adapter card.

Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

2. Is the SRC B600 6902 or B600 69E0?

No **Yes**

↓ The remote SPD optical bus receiver failed.

Perform the following:

- a. Power off the system.
- b. Verify that the power indicator on the SPD migrated tower is off. If the indicator remains on, you *may* need to power off the SPD migrated tower that is attached through the OS/400–OptiConnect hardware.
- c. Exchange the remote SPD optical bus receiver in the SPD migrated tower for the failing bus (position 2 for FC 5080 or FC 5082; position 1 for FC 5044, FC 5070, and FC 5072; position CB1 for FC 5065).
- d. Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

3. Is the SRC B600 69D0?

Yes **No**

↓ Go to step 5 of this procedure.

4. A SPD optical bus driver card is failing.

Refer to “Optical Link Addressing Information” on page 745 to determine the location of the SPD optical bus driver card for your SPD migrated tower.

Power off the SPD migrated tower and exchange the failing local SPD optical bus driver card.

Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

5. Is the SRC B600 69B8?

Yes **No**

↓ Go to step 7 of this procedure.

6. The SRC indicates a bus configuration problem.

Perform the following:

- Ensure that all optical connections are tight.
- Ensure that the cable in the top, even-number position (shown in the following figures as E) of the local SPD optical bus driver card is connected to the top connector (E) of the remote SPD optical bus receiver card.

Bus PIPs

- Ensure that the cable in the bottom, odd-number position (shown in the following figures as **O**) of the local SPD optical bus driver card is connected to the bottom connector (**O**) of the remote SPD optical bus receiver card.
- Use the system configuration list and the following configuration examples to identify the correct configuration for your SPD migrated tower.

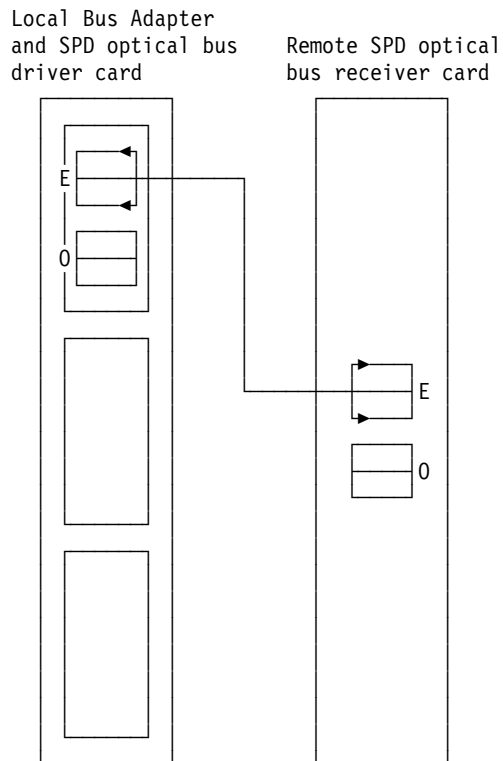


Figure 1. Example Single Bus

Bus PIPs

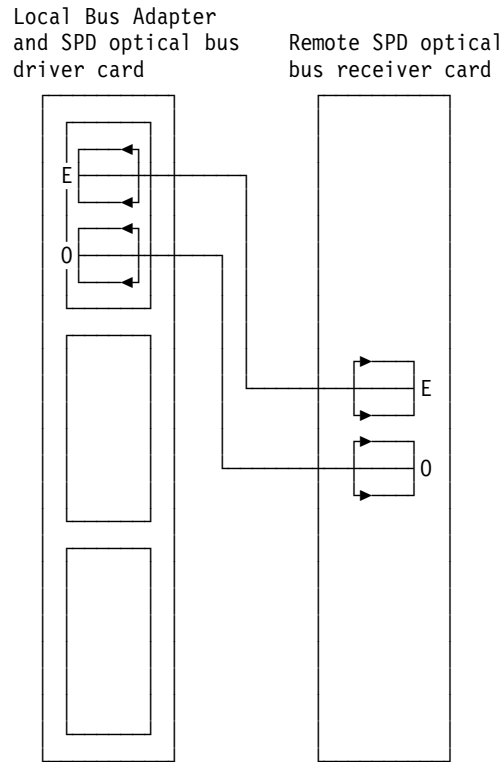


Figure 2. Example Paired Bus

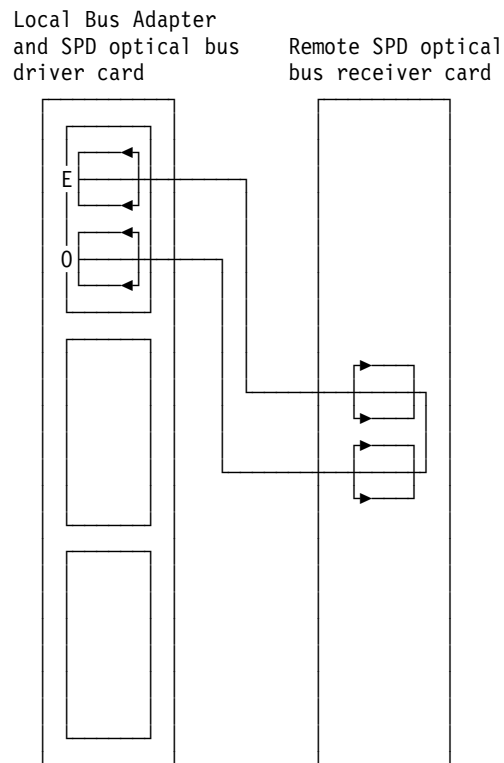


Figure 3. Paired Buses with an Internal Copper Secondary Link

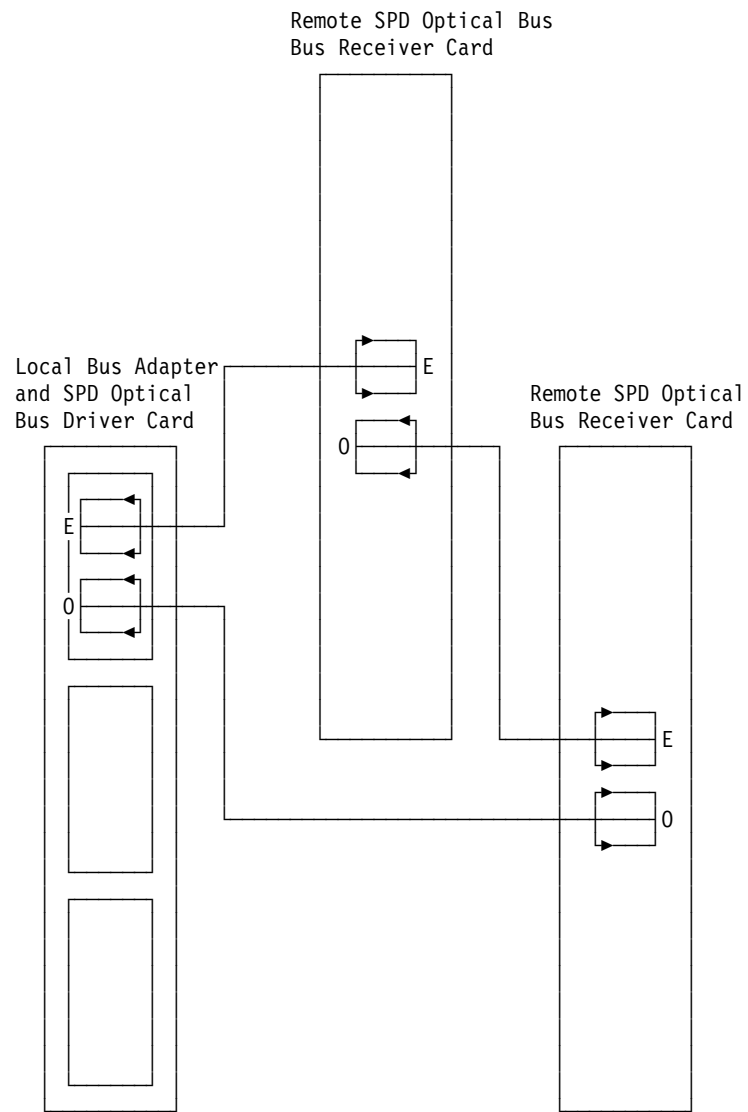


Figure 4. Example Paired Buses, Optical Secondary Link

Bus PIPs

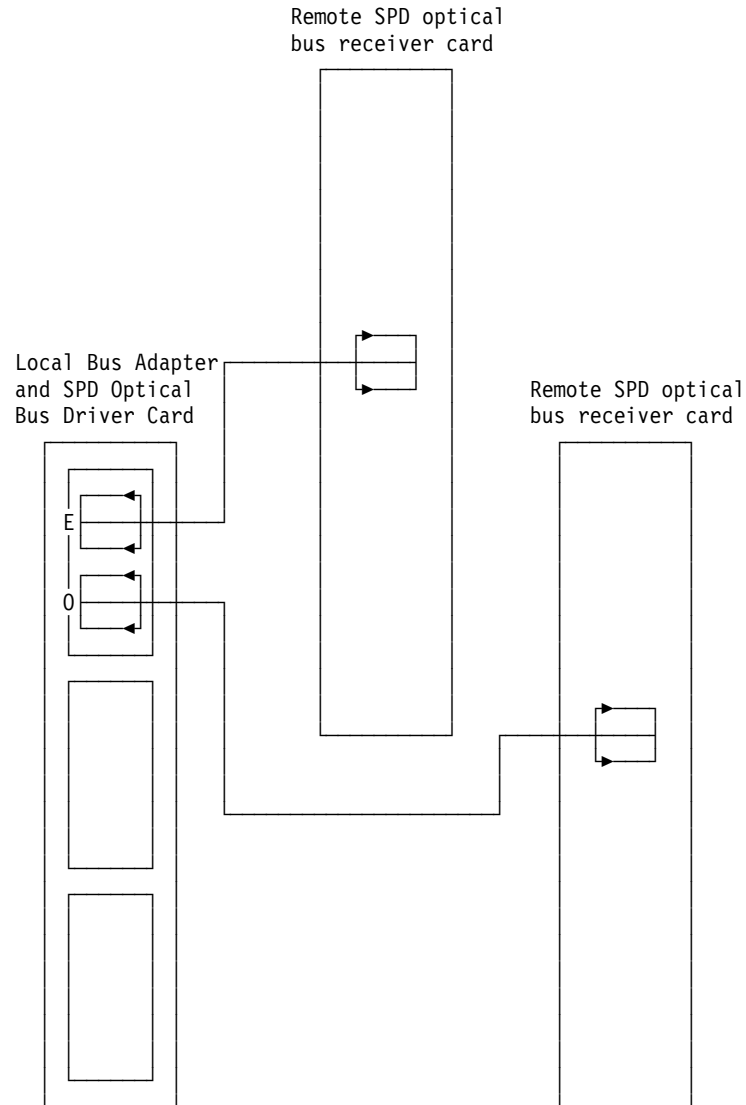


Figure 5. Example Single Bus Connection, No Redundancy

Did you correct the configuration problem?

No **Yes**

↓ Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

7. Find the bus expansion tower for the failing bus.

Is the power indicator light off, or is a power reference code (1xxx xxxx) displayed on the expansion tower control panel?

No **Yes**

↓ Go to step 10 of this procedure.

8. Does the remote SPD optical bus receiver have an optical cable in the bottom-most position that connects to a remote SPD optical bus receiver card in another bus expansion tower?

Yes **No**

↓ Go to step 11 of this procedure.

9. Find the bus expansion tower for the bus that is paired with the failing bus. Is the power indicator light off, or is a power reference code (1xxx xxxx) displayed on the expansion tower control panel?

Yes No

↓ Go to step 11 of this procedure.

10. Go to "Cannot Power On Secondary Frame (No SRC) in Chapter 1 of the main system problem analysis book. If that does not isolate the problem, check the backplane for bent or broken pins. If there are no bent or broken pins, exchange the failing items that are listed in FI00065 one at a time. Only exchange failing items from the list that are located in this expansion tower.

This ends the procedure.

11. Perform the following to verify the configuration of the optical bus hardware:
- Ensure that both ends of all optical cables are tightly connected.
 - Use the system configuration list, and Figure 1 through Figure 5 on page 274 to identify the correct configuration for your SPD migrated tower. Verify that the optical bus cable connections are correct. Use the *AS/400e server 170, 250, 6xx, 7xx, and Sxx System Installation and Upgrade* if you need to verify the system configuration rules.
 - Ensure that an optical wrap plug is installed on the local local SPD optical bus driver card for all buses that are not used.
 - Use the cleaning kit if you suspect that the optical bus cables are dirty.
 - Ensure that there are no bends in the optical bus cables less than a 2.54 cm (1 in) radius and no coils in the cables less than a 3.05 cm (1.2 in) diameter.

Did you make an adjustment?

Yes No

↓ Go to step 13 of this procedure.

12. Power off the system (if it is not already powered off). Power the system on. Does the Entry Point SRC or error occur?

Yes No

↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

13. Is the SRC that sent you to this procedure B600 69E8?

Yes No

↓ Go to step 19 of this procedure.

14. Trace the optical cable of the failing bus from the local local SPD optical bus driver card to the remote SPD optical bus receiver. Is the remote SPD optical bus receiver connected to another remote SPD optical bus receiver through a secondary optical cable?

Yes No

↓ Perform the following:

- Power off the system.

Bus PIPs

- b. Verify that the power indicator on the expansion tower is off. If the indicator remains on, you *may* need to power off the system unit that is attached through the OS/400–OptiConnect hardware.
- c. Exchange the remote SPD optical bus receiver for the failing bus.
- d. Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

15. Perform the following:
 - a. Power off the system and verify that the expansion tower power indicator is off.
 - b. Exchange the remote SPD optical bus receiver for the failing bus.
 - c. Power on the system.

Does SRC B600 69E8 occur on the control panel, on the console, in the service action log, or in the product activity log?

Yes No

- ↓ Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

16. Perform the following:
 - a. Power off the system and verify that the expansion tower power indicator is off.
 - b. Remove the remote SPD optical bus receiver card that you just exchanged.
 - c. Reinstall the original remote SPD optical bus receiver card.
 - d. Exchange the remote SPD optical bus receiver for the bus that is paired with the failing bus.

Refer to “Optical Link Addressing Information” on page 745 to view bus pairings on the local SPD optical bus driver card.

- e. Power on the system.

Does SRC B600 69E8 occur on the control panel, on the console, in the service action log, or in the product activity log?

Yes No

- ↓ Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

17. Perform the following:
 - a. Power off the system and verify that the expansion tower power indicator is off.
 - b. Remove the remote SPD optical bus receiver card that you just exchanged and install the original.
 - c. Exchange the secondary optical cable that connects the remote SPD optical bus receivers of the paired buses together.
 - d. Power on the system.

Does SRC B600 69E8 occur on the control panel, on the console, in the service action log, or in the product activity log?

Yes No

- ↓ Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

18. Go to step 36 of this procedure.

19. Check the local SPD optical bus driver card of the failing bus.
Is either of the two connectors on this local SPD optical bus driver card disconnected?
Yes No
↓ Go to step 24 of this procedure.
20. Power off the system.
Use the system configuration list to determine the bus configuration of the system. If a bus should be connected to this local SPD optical bus driver card and it is not connected, ensure that it is connected. To do this, find the expansion tower for the bus and ensure that a cable is connected between its remote SPD optical bus receiver and the local SPD optical bus driver card. Otherwise, if there are no missing buses, ensure that wrap plugs are installed on the unused connectors on the local SPD optical bus driver card.
21. Power on the system.
Does the SRC that sent you to this procedure occur on the control panel, on the console, in the service action log, or in the product activity log?
Yes No
↓ Go to "BUS-PIP8" on page 294 to verify the repair.
This ends the procedure.
22. Is an SPD optical bus driver card terminator (PN 16G5609) available?
Yes No
↓ Go to step 24.
23. Perform the following:
 - a. Power off the system.
 - b. Install the SPD optical bus driver card terminator on the local SPD optical bus driver card.
 - c. Power on the system.
 Does the SRC that sent you to this procedure occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?
Yes No
↓ Go to step 29.
24. Power off the system and exchange the local SPD optical bus driver card for the failing bus.
Power on the system.
Does the SRC that sent you to this procedure occur on the control panel, on the console, in the service action log, or in the product activity log?
Yes No
↓ Go to "BUS-PIP8" on page 294 to verify the repair.
This ends the procedure.
25. Perform the following:
 - a. Power off the system.
 - b. Verify that the power indicator on the expansion tower is off. If the indicator remains on, you *may* need to power off the system unit that is attached through the OS/400–OptiConnect hardware.

Bus PIPs

- c. Disconnect the local SPD optical bus driver card that you just installed and reconnect the original local SPD optical bus driver card.
- d. Exchange the remote SPD optical bus receiver for the failing bus.
- e. Power on the system.

Does the SRC that sent you to this procedure occur on the control panel, on the console, in the service action log, or in the product activity log?

Yes **No**

↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

26. Is the SRC that sent you to this procedure B600 69F8?

Yes **No**

↓ Go to step 30 of this procedure.

27. Perform the following:

- a. Power off the system and verify that the expansion tower power indicator is off.
- b. Disconnect the remote SPD optical bus receiver that you just exchanged and reinstall the original.
- c. Exchange the optical cable between the local SPD optical bus driver card and the remote bus adapter on the even bus of the bus pair you are working with. This is the top position of the local SPD optical bus driver card with the failing bus.
- d. Power on the system.

Does the SRC that sent you to this procedure occur on the control panel, on the console, in the service action log, or in the product activity log?

Yes **No**

↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

28. Go to step 36 of this procedure.

29. Determine if the optical cable is functioning properly. Go to "BUS-PIP11" on page 305. Then return here with the results and continue with this procedure.

Is the cable **functioning properly**?

No **Yes**

↓ Go to step 31 on page 279 of this procedure.

This ends the procedure.

30. Perform the following:

- a. Power off the system and verify that the expansion tower power indicator is off.
- b. If you just exchanged the remote SPD optical bus receiver, then disconnect it and reinstall the original.
- c. Exchange both optical cables between the local SPD optical bus driver card and the remote SPD optical bus receivers.
- d. Power on the system.

Does the SRC that sent you to this procedure occur on the control panel, on the console, in the service action log, or in the product activity log?

Yes No

↓ Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

31. Is the SRC that originally sent you to this procedure B600 69F0 or B600 6905?

Yes No

↓ The SRC that originally sent you to this procedure is B600 69D8.

Go to step 35 of this procedure.

32. Trace the optical cable of the failing bus from the local SPD optical bus driver card to the remote SPD optical bus receiver.

Is the remote SPD optical bus receiver connected to another remote SPD optical bus receiver?

Yes No

↓ Go to step 35 of this procedure.

33. Perform the following:

- a. Power off the system.
- b. Verify that the power indicator on the expansion tower is off. If the indicator remains on, you *may* need to power off the system unit that is attached through the OS/400–OptiConnect hardware.
- c. Exchange the remote SPD optical bus receiver for the paired bus. This is the other bus that is connected to the local SPD optical bus driver card with the failing bus.
- d. Power on the system.

Does the SRC that sent you to this procedure occur on the control panel, on the console, in the service action log, or in the product activity log?

Yes No

↓ Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

34. Perform the following:

- a. Power off the system.
- b. Disconnect the remote SPD optical bus receiver that you just exchanged and reinstall the original bus adapter.
- c. Exchange the secondary optical cable between the remote SPD optical bus receivers.
- d. Power on the system.

Does the SRC that sent you to this procedure occur on the control panel, on the console, in the service action log, or in the product activity log?

Yes No

↓ Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

35. Perform the following:

- a. Power off the system.
- b. Exchange the local bus expansion adapter (see symbolic FRU “LBUSADP-503x” on page 575”).
- c. Power on the system.

Bus PIPs

Does the SRC that sent you to this procedure occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?

Yes **No**

↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

36. Perform the following:

- a. Power off the system and verify that the expansion tower power indicator is off.
- b. Exchange all of the parts in the failing item list at the same time. Exchange the local SPD optical bus driver card, all remote SPD optical bus receiver cards, and any optical link cables that are in the failing item list.
- c. Power on the system.

Does the SRC that sent you to this procedure occur on the control panel, on the console, in the service action log, or in the product activity log?

Yes **No**

↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

37. Ask your next level of support for assistance.

This ends the procedure.

BUS-PIP6 (5077)

Introduction: This procedure isolates a failure in the hardware that is driving the fiber optics on an SPD optical bus.

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

Note: This procedure will indicate the logical partition in which to perform service. Whenever the service actions in this procedure move from one logical partition to a different logical partition this procedure will indicate which logical partition to perform service in.

Note: If you came to this procedure from another bus isolation procedure, continue working in the same logical partition. If you did not come here from another bus isolation procedure, then move to the console of the logical partition which owns this bus. To determine which logical partition owns the bus and locate the console of a secondary partition see *AS/400 Service Functions*.

If the system has logical partitions, move to the Primary partition and perform this procedure from there.

Refer to the "Overview" on page 232 for a list of Attentions, Dangers and understanding the SRC.

1. Is the SRC that sent you to this procedure B600 6901?

Yes **No**

↓ Go to step 3 of this procedure.

2. The reference code indicates that the local bus adapter card failed.
 Power off the system and exchange the local bus adapter in card position S09 of the migrated tower.
 Ensure that the attached SPD optical bus driver cards are moved to the new bus adapter card.
 Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

3. Is the SRC B600 6902 or B600 69E0?

No Yes

↓ The remote SPD optical bus receiver failed.

Perform the following:

- a. Power off the system.
- b. Verify that the power indicator on the expansion tower is off. If the indicator remains on, you *may* need to power off the system unit that is attached through the OS/400–OptiConnect hardware.
- c. Exchange the remote SPD optical bus receiver in the expansion tower for the failing bus (position 2 for FC 508x; position 1 for FC 5044, FC 507x).
- d. Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

4. Is the SRC B600 69D0?

Yes No

↓ Go to step 6 of this procedure.

5. A local SPD optical bus driver card is failing.

Using the bus number from the DSA in the SRC, or the Service Action Log refer to “Optical Link Addressing Information” on page 745 to determine the location of the SPD optical bus driver card for your system.

Power off the system and exchange the failing local SPD optical bus driver card.

Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

6. Is the SRC B600 69B8?

Yes No

↓ Go to step 8 of this procedure.

7. The SRC indicates a bus configuration problem.

Perform the following:

- Ensure that all optical connections are tight.
- Ensure that the cable in the top, even-number position (shown in the following figures as **E**) of the SPD optical bus driver card is connected to the top connector (**E**) of the remote SPD optical bus receiver card.
- Ensure that the cable in the bottom, odd-number position (shown in the following figures as **O**) of the SPD optical bus driver card is connected to the bottom connector **O** of the remote SPD optical bus receiver card.
- Use the system configuration list and the following configuration examples to identify the correct configuration for your system.

Bus PIPs

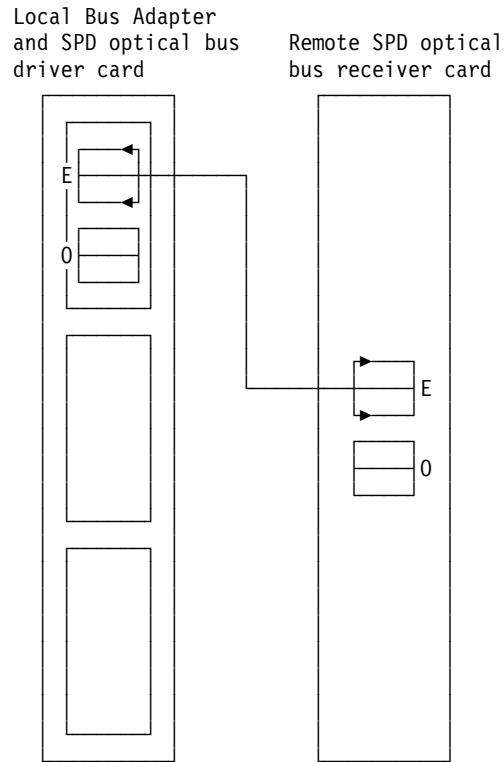


Figure 6. Example Single Bus

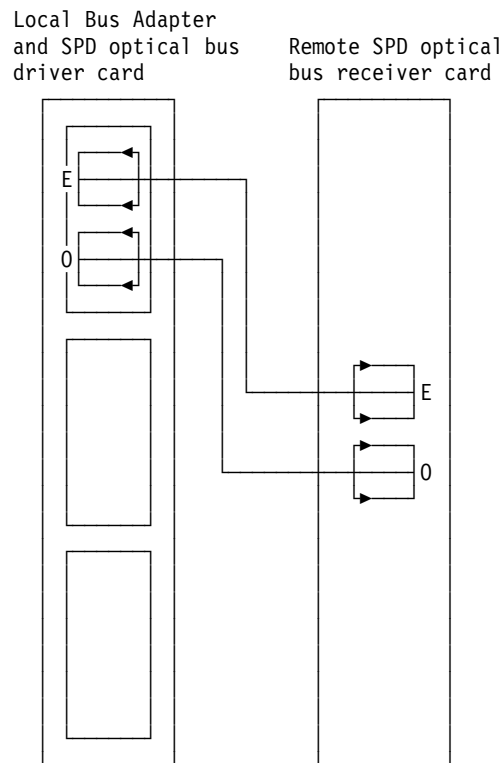


Figure 7. Example Paired Bus

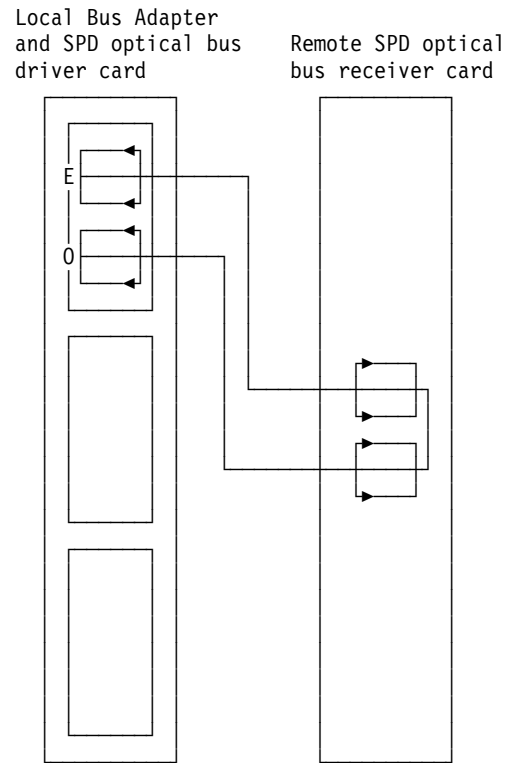


Figure 8. Paired Buses with an Internal Copper Secondary Link

Bus PIPs

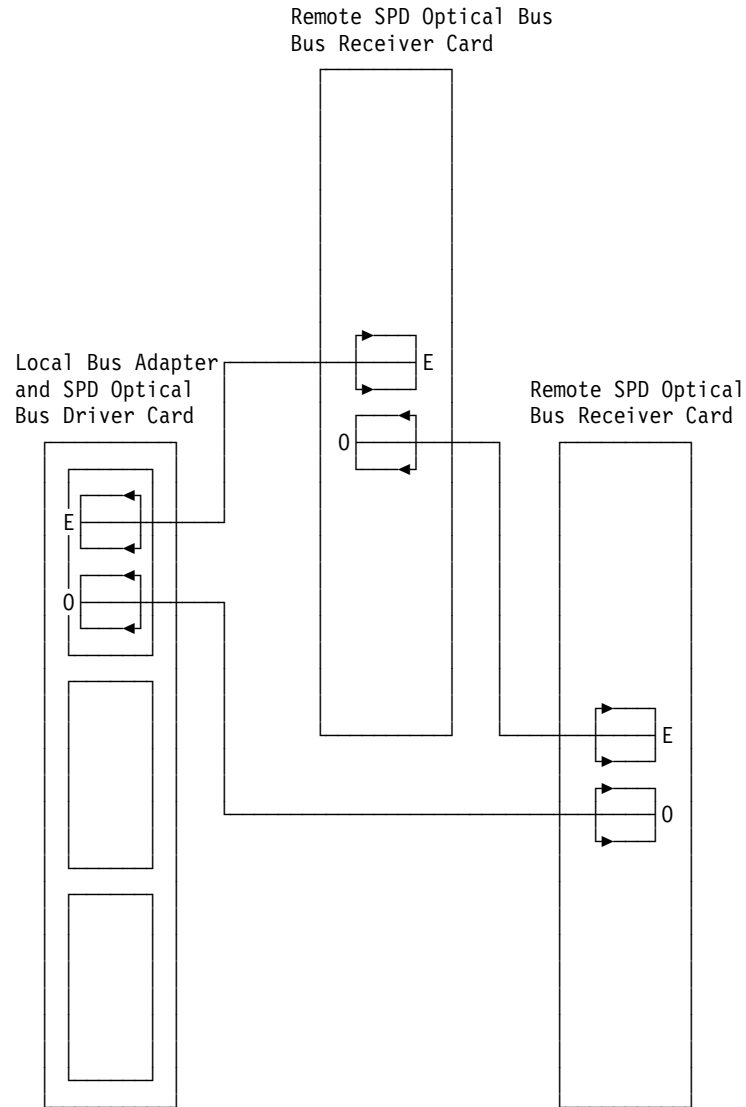


Figure 9. Example Paired Buses, Optical Secondary Link

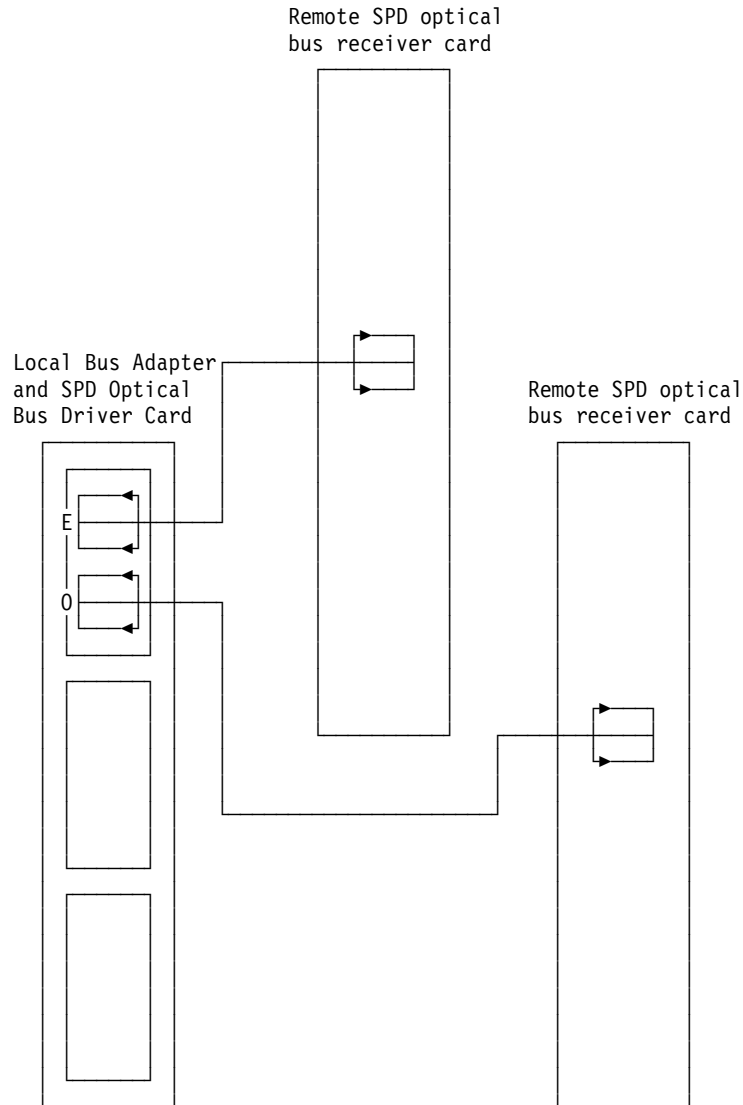


Figure 10. Example Single Bus Connection, No Redundancy

Did you correct the configuration problem?

No **Yes**

↓ Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

8. Find the bus expansion tower for the failing bus.

Is the power indicator light off, or is a power reference code (1xxx xxxx) displayed on the expansion tower control panel?

No **Yes**

↓ Go to step 11 of this procedure.

9. Does the remote SPD optical bus receiver have an optical cable in the bottom-most position that connects to a remote SPD optical bus receiver card in another bus expansion tower?

Yes **No**

Bus PIPs

↓ Go to step 12 of this procedure.

10. Find the bus expansion tower for the bus that is paired with the failing bus. Is the power indicator light off, or is a power reference code (1xxx xxxx) displayed on the expansion tower control panel?

Yes No

↓ Go to step 12 of this procedure.

11. Go to "Cannot Power On Secondary Frame (No SRC) in Chapter 1 of the main system problem analysis book. If that does not isolate the problem, check the backplane for bent or broken pins. If there are no bent or broken pins, exchange the failing items that are listed in FI00065 one at a time. Only exchange failing items from the list that are located in this expansion tower.

This ends the procedure.

12. Perform the following to verify the configuration of the optical bus hardware:
- Ensure that both ends of all optical cables are tightly connected.
 - Use the system configuration list, and Figure 6 through Figure 10 on page 285 to identify the correct configuration for your system. Verify that the optical bus cable connections are correct. Use the *AS/400e server 170, 250, 6xx, 7xx, and Sxx System Installation and Upgrade* or *AS/400e server 270 and 8xx System Installation and Upgrade* if you need to verify the system configuration rules.
 - Ensure that an optical wrap plug is installed on the local SPD optical bus driver card for all buses that are not used.
 - Use the cleaning kit if you suspect that the optical bus cables are dirty.
 - Ensure that there are no bends in the optical bus cables less than a 2.54 cm (1 in) radius and no coils in the cables less than a 3.05 cm (1.2 in) diameter.

Did you make an adjustment?

Yes No

↓ Go to step 14 of this procedure.

13. Power off the system (if it is not already powered off). Power the system on. Does the Entry Point SRC or error occur?

Yes No

↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

14. Is the SRC that sent you to this procedure B600 69E8?

Yes No

↓ Go to step 20 of this procedure.

15. Trace the optical cable of the failing bus from the local SPD optical bus driver card to the remote SPD optical bus receiver. Is the remote SPD optical bus receiver connected to another remote SPD optical bus receiver through a secondary optical cable?

Yes No

↓ Perform the following:

- Power off the system.

- b. Verify that the power indicator on the expansion tower is off. If the indicator remains on, you *may* need to power off the system unit that is attached through the OS/400–OptiConnect hardware.
- c. Exchange the remote SPD optical bus receiver for the failing bus.
- d. Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

16. Perform the following:

- a. Power off the system and verify that the expansion tower power indicator is off.
- b. Exchange the remote SPD optical bus receiver for the failing bus.
- c. Power on the system.

Does SRC B600 69E8 occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?

Yes No

↓ Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

17. Perform the following:

- a. Power off the system and verify that the expansion tower power indicator is off.
- b. Remove the remote SPD optical bus receiver card you just exchanged.
- c. Reinstall the original remote SPD optical bus receiver.
- d. Exchange the remote SPD optical bus receiver for the bus that is paired with the failing bus.

Refer to Figure 78 on page 747 to view bus pairings on the local SPD optical bus driver card.

- e. Power on the system.

Does SRC B600 69E8 occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?

Yes No

↓ Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

18. Perform the following:

- a. Power off the system and verify that the expansion tower power indicator is off.
- b. Remove the SPD optical bus receiver card you just exchanged and install the original.
- c. Exchange the secondary optical cable that connects the remote SPD optical bus receivers of the paired buses together.
- d. Power on the system.

Does SRC B600 69E8 occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?

Yes No

↓ Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

19. Go to step 38 of this procedure.

Bus PIPs

20. Check the local SPD optical bus driver card of the failing bus.
Is either of the two connectors on this SPD optical bus driver card disconnected?
- Yes No**
- ↓ Go to step 26 of this procedure.
21. Power off the system.
Use the system configuration list to determine the bus configuration of the system. If a bus should be connected to this local SPD optical bus driver card and it is not connected, ensure that it is connected. To do this, find the expansion tower for the bus and ensure that a cable is connected between its remote SPD optical bus receiver and the local SPD optical bus driver card.
Otherwise, if there are no missing buses, ensure that wrap plugs are installed on the unused connectors on the local SPD optical bus driver card.
22. Power on the system.
Does the SRC that sent you to this procedure occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?
- Yes No**
- ↓ Go to "BUS-PIP8" on page 294 to verify the repair.
This ends the procedure.
23. Power on the system.
Does the SRC that sent you to this procedure occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?
- Yes No**
- ↓ Go to "BUS-PIP8" on page 294 to verify the repair.
This ends the procedure.
24. Is an SPD optical bus driver card terminator (PN 16G5609) available?
- Yes No**
- ↓ Go to step 26.
25. Perform the following:
- Power off the system.
 - Install the SPD optical bus driver card terminator on the SPD optical bus driver card.
 - Power on the system.
- Does the SRC that sent you to this procedure occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?
- Yes No**
- ↓ Go to step 31.
26. Power off the system and exchange the local SPD optical bus driver card for the failing bus.
Power on the system.
Does the SRC that sent you to this procedure occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?
- Yes No**
- ↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

27. Perform the following:
- Power off the system.
 - Verify that the power indicator on the expansion tower is off. If the indicator remains on, you *may* need to power off the system unit that is attached through the OS/400–OptiConnect hardware.
 - Exchange the remote SPD optical bus receiver for the failing bus.
 - Power on the system.

Does the SRC that sent you to this procedure occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?

Yes No

↓ Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

28. Is the SRC that sent you to this procedure B600 69F8?

Yes No

↓ Go to step 32 of this procedure.

29. Perform the following:
- Power off the system and verify that the expansion tower power indicator is off.
 - Exchange the optical cable between the local SPD optical bus driver card and the remote SPD optical bus receiver on the even bus of the bus pair you are working with. This is the top position of the local SPD optical bus driver card with the failing bus.
 - Power on the system.

Does the SRC that sent you to this procedure occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?

Yes No

↓ Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

30. Go to step 38 of this procedure.
31. Determine if the optical cable is functioning properly. Go to “BUS-PIP11” on page 305. Then return here with the results and continue with this procedure. Is the cable **functioning properly**?

No Yes

↓ Go to step 33 on page 290 of this procedure.

This ends the procedure.

32. Perform the following:
- Power off the system and verify that the expansion tower power indicator is off.
 - Disconnect the remote SPD optical bus receiver you just exchanged and reinstall the original.
 - Exchange both optical cables between the local SPD optical bus driver card and the remote SPD optical bus receivers.
 - Power on the system.

Bus PIPs

Does the SRC that sent you to this procedure occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?

Yes No

↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

33. Is the SRC that originally sent you to this procedure B600 69F0 or B600 6905?

Yes No

↓ The SRC that originally sent you to this procedure is B600 69D8.

Go to step 37 of this procedure.

34. Trace the optical cable of the failing bus from the local SPD optical bus driver card to the remote SPD optical bus receiver.

Is the remote SPD optical bus receiver connected to another remote SPD optical bus receiver?

Yes No

↓ Go to step 37 of this procedure.

35. Perform the following:

- a. Power off the system.
- b. Verify that the power indicator on the expansion tower is off. If the indicator remains on, you *may* need to power off the system unit that is attached through the OS/400–OptiConnect hardware.
- c. Exchange the remote SPD optical bus receiver card for the paired bus. This is the other bus that is connected to the local SPD optical bus driver card with the failing bus.
- d. Power on the system.

Does the SRC that sent you to this procedure occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?

Yes No

↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

36. Perform the following:

- a. Power off the system.
- b. Disconnect the remote SPD optical bus receiver you just exchanged and reinstall the original bus adapter.
- c. Exchange the secondary optical cable between the remote SPD optical bus receivers.
- d. Power on the system.

Does the SRC that sent you to this procedure occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?

Yes No

↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

37. Perform the following:

- a. Power off the system.

- b. Exchange the local bus adapter (see symbolic FRU ""LBUSADP"" on page 575").
- c. Power on the system.

Does the SRC that sent you to this procedure occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?

Yes No

↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

38. Perform the following:

- a. Power off the system and verify that the expansion tower power indicator is off.
- b. Exchange all of the parts in the failing item list at the same time. Exchange the local SPD optical bus driver card, all remote SPD optical bus receivers, and any SPD optical bus driver cables that are in the failing item list.
- c. Power on the system.

Does the SRC that sent you to this procedure occur on the control panel, on the console, in the Service Action Log, or in the Product Activity Log?

Yes No

↓ Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

39. Ask your next level of support for assistance.

This ends the procedure.

BUS-PIP7

Introduction: This procedure isolates a failure in the OS/400–OptiConnect hardware. OS/400–OptiConnect hardware connects AS/400 systems together through SPD optical bus receiver cards. The system that reports the failure does not necessarily have the failure.

The connected systems may vary in system type and model. Ensure that you are in the correct problem analysis book for your system.

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

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

Perform this procedure from the logical partition or system that is reporting the problem.

To determine which logical partition owns the input-output processors (IOP) or to locate the console of a secondary partition, see *AS/400 Service Functions*.

Bus PIPs

Certain conditions may cause the shared SPD optical bus receiver cards to show a status of Failed under system service tools. These include:

- The remote system or logical partition is not powered on, is still powering up, or is experiencing some hang condition where it is not responding.
- The optical cables to the remote system are damaged or not installed.
- The shared SPD optical bus receiver card-optical jumper is installed.
- The shared SPD optical bus receiver card-optical wrap plugs are installed.
- The shared SPD optical bus receiver card is failing.

When a remote system or logical partition powers up late, the UNKNOWN resource with the Failed status may remain as an entry in the resource list. However, this entry is supplemented with an additional entry showing the shared bus adapter as a resource with its card type and a status of Operational. Displaying additional details on these resources shows them at the same card location.

Note: Do not perform this procedure unless you have been trained on OS/400–OptiConnect. If you have **not** been trained on OS/400–OptiConnect, call your next level of support for assistance.

1. Go to “Appendix F. OptiConnect Table” on page 907.

Does the table contain written information?

Yes **No**

↓ The table was not completed when the system was installed. Call your next level of support for assistance.

This ends the procedure.

2. Record the status of every OS/400–OptiConnect resource on **ALL** systems by using the Work with Hardware resources (WRKHDWRSC *CSA) command.

Note: If any system connected with OS/400–OptiConnect has logical partitions, then record the status of OS/400–OptiConnect resources on all logical partitions which have OS/400–OptiConnect hardware. Each logical partition which owns OS/400–OptiConnect hardware must be considered a separate system in the OS/400–OptiConnect configuration.

Mark the host buses of the network in the table.

Are there any host buses with a status of failed, disabled, or inoperative? (Look at the status beside the host bus, not the IOPs listed under the bus.)

No **Yes**

↓ Go to “BUS-PIP3” on page 257.

Note: If this is a dual host configuration, this machine may still be operational. Check with the customer before proceeding.

3. Do the host bus or buses have one or more IOPs failing?

Yes **No**

↓ Go to step 8 of this procedure.

4. Is the non-host system, or are the non-host systems powered on?

Note: For any non-host system, or any non-host systems which have logical partitions, check that each logical partition connected with OS/400–OptiConnect hardware is powered on.

Yes No

↓ Ask the customer why the system, or systems, logical partition, or logical partitions are powered off.

This ends the procedure.

5. On the command line, enter DSPOPCLNK (the display-SPD optical bus driver command). Identify the Down Links. Press the display the alternate view function key (F11) to identify the remote system bus.

Check all optical bus cables between failed non-host and host buses. Connect unplugged cables.

Did you fix a problem (example: connect an unplugged cable)?

Yes No

↓ Go to step 9 of this procedure.

6. Wait at least 5 minutes for the link to return to operational.

Does the card become operational?

No Yes

↓ Go to step 18 of this procedure.

7. Go to step 9 of this procedure.

8. Does a non-host bus or any non-host buses have a failed, disabled, or inoperative IOP?

Yes No

↓ Go to step 16 of this procedure.

9. Perform the following:

- a. Use the STRSST command to start System Service Tools.

- b. Select the *Start a Service Tool* option.

- c. Select the *Hardware service manager* option.

- d. Select the *Logical Resources* option from the Hardware Service Manager display.

- e. Select the *System Bus Resources* option to view the status of the non-host buses on all of the systems.

- f. Select the *Display detail* option on the Logical Hardware Resources display.

- g. Note the card type/model number and the attached system name/logical partition ID for the failing resource.

10. **Before you continue, read and understand this step.**

This card may still have active connections to other systems. Check with the customer to find a time when an IOP IPL can be performed with minimal or no OS/400–OptiConnect activity on the attached system or logical partition that is identified in step 9 of this procedure.

Do not IPL an IOP from a non-host system or logical partition. This will cause the IPL to fail and may hang the service tool screen until the next IPL.

11. From the host system/logical partition, select the Perform I/O Debug option for the failed resource.. On the *Select IOP Debug Function* display, select the option to IPL the I/O processor.

The IPL may take several minutes to complete.

Bus PIPs

The IPL may return with a status of failed. However, after several minutes the link may become operational. This can be expected and is a good result.

12. Does the IOP become operational?

No **Yes**

↓ Go to step 18 of this procedure.

13. IPL the non-host system or logical partition.

Does the failed resource become operational?

No **Yes**

↓ Go to step 18 of this procedure.

14. IPL the host system or logical partition.

Does the failed resource become operational?

No **Yes**

↓ Go to step 18 of this procedure.

15. Exchange the following one at a time:

- Shared SPD optical bus receiver card

Note: The card may not show a failed status.

- SPD optical bus driver card
- Cables between the IOPs

If you have not corrected the problem, call your next level of support.

This ends the procedure.

16. Are you here because of a 69C1 reference code?

Note: If you need assistance at this point, call your next level of support.

Yes **No**

↓ Call your next level of support.

This ends the procedure.

17. Ask the customer if there was IPL activity at the time of the error.

Note: If you need assistance at this point, call your next level of support.

Was there IPL activity at the time of the error?

Yes **No**

↓ Call your next level of support.

This ends the procedure.

18. Check all systems/logical partitions (with OS/400–OptiConnect hardware) and verify that all hardware is operational using the WRKHDWRSC *CSA command.

Return to step 1 of this procedure if any hardware resource does not report as operational.

This ends the procedure.

BUS-PIP8

Introduction: This procedure will verify an SPD bus repair.

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

Perform this procedure from the logical partition you were in when you were sent to this procedure.

To determine which logical partition owns an I/O resource or to locate the console of a secondary partition, see *AS/400 Service Functions*.

Perform the following procedure to ensure that the system functions correctly after you perform a bus isolation procedure. Use this procedure to verify a bus repair.

1. Power off the system or expansion tower where the service action was performed.
2. Install all cards, cables, and hardware. Ensure that all connections are tight. You may use the system configuration list to verify that the cards are installed correctly.
3. Power on the system or expansion tower.

Does the IPL complete successfully to the IPL or Install the System Display or does the expansion tower power on complete successfully?

Yes No

↓ An SRC occurred.

Go to "Chapter 2. Unit Reference Codes" on page 17 to correct the problem.

This ends the procedure.

4. Does the system/logical partition have mirrored protection?

Note: If you do not know the type of protection on your system/logical partition, select **Yes**.

Yes No

↓ Go to step 6 of this procedure.

5. From the Dedicated Service Tools (DST) display, select the *Work with disk units* option and resume mirrored protection for all units that have a suspended status. (See "Work with Disk Unit Recovery" in the *AS/400 Service Functions* information).
6. From the Start a Service Tool display, select the *Hardware service manager* option and look for the I/O processors 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*.

No Yes

↓ Go to step 12 of this procedure.

7. Display the logical hardware resource information for the non-operational I/O processors.

If more than one I/O processor is failing, record the bus, board, and card information for the card with the lowest logical card address.

8. Perform the following:
 - a. Return to the Dedicated Service Tools (DST) display.
 - b. Display the Product Activity Log.

Bus PIPs

- c. Select the *All logs* option and search for an entry with the same bus, board, and card address information as the non-operational I/O processor.

Note: 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 **Yes**

↓ Ask your next level of support for assistance.

This ends the procedure.

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

Yes **No**

↓ A different SRC is associated with the non-operational I/O processor.
Go to "Chapter 2. Unit Reference Codes" on page 17 to correct the problem.

This ends the procedure.

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

Yes **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 "BUS-PIP8" on page 294 to verify the bus repair.

This ends the procedure.

11. Use the other B600 xxxx SRC to determine the problem.

Go to "Chapter 2. Unit Reference Codes" on page 17 to correct the problem.

This ends the procedure.

12. Use the hardware service manager function to print the system configuration list.

Are there any configuration mismatches?

No **Yes**

↓ Ask your next level of support for assistance.

This ends the procedure.

13. You have verified the repair of the system bus.

If only an expansion tower was powered off for this service action, go to step 14 on page 297.

Perform the following to return the system to the customer:

- a. Power off the system/logical partition.
- b. Select the operating mode with which the customer was originally running

.

If the system was powered off, select the mode on the system control panel. If a secondary partition was powered off, select the mode on the *Work with Partition Status* screen under DST. (See *AS/400 Service Functions*.)

- c. Power on the system/logical partition.

14. 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. (See *AS/400 Service Functions*).

This ends the procedure.

BUS-PIP9

Introduction: This procedure isolates a solid failure on the FC 5044 Expansion Tower.

FC 5044 Cabling and Bus Numbering Assumption: This procedure assumes that the FC 5044 tower installation instructions were followed and therefore the tower was cabled to the system in the following way:

1. The optical cable port pair on the system unit's bus driver card for the even bus number connects to the top cable ports on the 2684 bus receiver card in the tower.
2. The optical cable port pair on the system unit's bus driver card for the odd bus number connects to the bottom port pair on the 2684 bus receiver card in the tower.

Note: Empty card positions (between I/O processors) are not allowed on the system SPD bus. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

Note: This procedure must perform service in the Primary partition. If you came to this procedure while working in another logical partition, then move to the console of the Primary partition. Perform this procedure from there.

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Read the "Overview" on page 232 before continuing with this procedure.

Attention: If the expansion unit is connected through OS/400–OptiConnect hardware, you may need to power off more than one system unit during this procedure.

1. Read and understand the "FC 5044 Cabling and Bus Numbering Assumption". Determine which card positions in the tower you will perform service on using the following procedure.

If the FC 5044 tower is cabled to the system as described in the Cabling and Bus Numbering Assumption:

- In V4R4 and earlier system models running any supported software version and release: The even bus number is in tower card positions C02 through C07. The odd bus number is in tower card positions C08 through C13.
- In V4R5 system models which have a migrated 5044 AND the cabling to the 5044 was not altered: The odd bus number is in tower card positions C02 through C07. The even numbered bus is in tower card positions C08 through C13.

If the FC 5044 tower was cabled to the system differently than as described in the Cabling and Bus Numbering Assumption:

Bus PIPs

- The bus number cabled to the top port pair on the 2684 bus receiver card is in card positions C02 through C07.
 - The bus number cabled to the bottom port pair on the 2684 bus receiver card is in card positions C08 through C13.
2. Power off the system unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).

Attention: Verify that the system unit power indicator is off before you continue to the next step of this procedure. If the power indicator remains on, you may be working on a system that has OS/400–OptiConnect hardware. You may need to power off more than one system unit during this procedure.
 3. In the FC 5044 Expansion Unit, *for the bus you are isolating*, disconnect the cards at the following card positions (if installed) by sliding them partially out of the card enclosure:

Table 18. Card Positions

Bus in C02 through C07	Bus in C08 through C13
3	9
4	10
5	11
6	12
7	13
Note: Do not remove the I/O processor cards in positions 2 and 8, or the air flow cards.	

Use the system configuration list to verify the configuration as you work.

4. Did you remove any cards in the previous step?

No Yes

↓ Go to step 8 of this procedure.
5. Airflow cards are installed in the positions that are shown in Table 18. Is an SPD optical bus receiver card (not an airflow card) installed in the first position on the bus? Use the following table to determine the card position.

Table 19. Card Positions

Bus in C02 through C07	Bus in C08 through C13
2	8

- No Yes**
- ↓ Go to step 9 of this procedure.
6. Check the printed system configuration list to determine if I/O processors are supposed to be on this bus.

Are any I/O processors missing?

Yes No

↓ If the Entry Point SRC was B600 6944, this indicates that there is an empty bus and the message can be ignored. If the Entry Point SRC was not B600 6944, ask your next level of support for assistance.

This ends the procedure.
 7. Ask your next level of support for assistance.

This ends the procedure.

8. Power on the system unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ Go to step 15 of this procedure.

9. Perform the following:
 - a. Power off the system unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Exchange the remote SPD optical bus receiver card.
 - c. Power on the system unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ The failing item is the remote SPD optical bus receiver card, which you have already exchanged.

Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

10. Remove the remote SPD optical bus receiver card you installed in the previous step and install the original remote SPD optical bus receiver card.
11. Perform “BUS-PIP5” on page 265 for the following cards:

Table 20. Card Positions

Bus in C02 through C07	Bus in C08 through C13
2	8

If BUS-PIP5 does not identify the failing item, return here and continue with the next step of this procedure.

12. Perform the following:
 - a. Power off the system unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Exchange the I/O processor card in the position that is shown in Table 20.
 - c. Power on the system unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Bus PIPs

Yes No

↓ The failing item is the I/O processor card, which you just exchanged.
Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

13. Perform the following:
 - a. Power off the system unit "Powering On and Powering Off the System or Expansion Tower" on page 868.
 - b. Remove the I/O processor you installed in step 12 of this procedure and install the original I/O processor card and the attached adapter cards.

14. The only failing item remaining is the expansion unit card enclosure.

Perform the following:

- a. Exchange the expansion unit card enclosure.
- b. Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

15. Install the cards you removed in step 3 of this procedure one at a time from the lowest to the highest position.

Note: Power off the system before installing each card. After you install each card, power on the system.

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ Repeat this step until the SRC or failure that sent you to this procedure occurs.

If the error does not occur, the problem may be intermittent. Ask your next level of support for assistance.

This ends the procedure.

16. Perform "BUS-PIP5" on page 265 for the last card you reinstalled in step 15 of this procedure.

Note: If BUS-PIP5 does not identify the failing item, return here and continue with the next step of this procedure.

17. Perform the following:
 - a. Power off the system unit (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
 - b. Exchange the I/O processor card you last reinstalled in step 15 of this procedure with a new I/O processor card of the same type.
 - c. Power on the system unit (see "Powering On and Powering Off the System or Expansion Tower" on page 868).

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ The failing item is the I/O processor card that you have already exchanged.

Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

18. Perform the following:
 - a. Power off the system unit (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
 - b. Remove the last card you exchanged.
 - c. Install the original I/O processor card and the attached adapter cards.
19. Perform the following:
 - a. Find the I/O processor card with the card position that is one less than the I/O processor card you are working with.
 - b. Exchange this I/O processor card.
 - c. Power on the system unit (see "Powering On and Powering Off the System or Expansion Tower" on page 868).

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ The failing item is the I/O processor card that you have already exchanged.

Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

20. Perform the following:
 - a. Power off the system unit (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
 - b. Remove the I/O processor card you installed in the previous step.
 - c. Install the original I/O processor card.
21. The only failing item remaining is the expansion unit card enclosure. Perform the following:
 - a. Exchange the expansion unit card enclosure.
 - b. Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

BUS-PIP10

Introduction: This procedure isolates a solid failure in the FC 5065 Expansion Tower.

Bus PIPs

Note: On a FC 5065 expansion tower the SPD IOP cards generate PCI for the I/O adapter cards they control. SPD I/O processor card positions are C03, C08 and C13. Empty SPD I/O processor card positions (between I/O processors) are not allowed on the system SPD bus which drives this I/O expansion tower. Card gaps may cause system reference codes (SRC) that provide incorrect FRU information. To determine if there are any card gaps, select the Display card gap information function key from the Hardware Service Manager display. If there are gaps, correct the situation.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

For this procedure you must perform service in the logical partition which owns the bus on this expansion tower. If you came to this procedure while working in another logical partition, then move to the console of the logical partition which owns this bus. Perform this procedure from there.

To determine which logical partition owns the bus or to locate the console of a secondary partition, see *AS/400 Service Functions*.

Read the “Overview” on page 232 before continuing with this procedure.

1. Power off the expansion tower. (See “Expansion Tower Power Procedure” on page 871).

Attention: Verify that the expansion unit power indicator is off before you continue to the next step of this procedure. If the power indicator remains on, you may be working on a system that has OptiConnect/400 hardware. You may need to power off more than one system unit during this procedure.

2. Disconnect the cards at the following card positions (if installed) by sliding them partially out of the card enclosure C01 through C15:

Note: Do not remove the bus connection cables.

Use the system configuration list to verify the configuration as you work.

3. Did you remove any cards in the previous step?

No **Yes**

↓ Go to step 6 of this procedure.

4. Check the printed system configuration list to determine if I/O processors are supposed to be on this bus.

Are I/O processors missing?

Yes **No**

↓ If the Entry Point SRC was B600 6944, this indicates that there is an empty bus and the message can be ignored. If the Entry Point SRC was not B600 6944, ask your next level of support for assistance.

This ends the procedure.

5. Ask your next level of support for assistance.

This ends the procedure.

6. Power on the expansion tower. (See “Expansion Tower Power Procedure” on page 871.)

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions which own I/O processor card resources on the bus.

Yes No

↓ Go to step 9 of this procedure.

7. Perform the following:

- a. Power off the expansion tower. (See “Expansion Tower Power Procedure” on page 871.)
- b. Remove the tower card (see “TWRCARD” on page 582) and install a new one.
- c. Power on the expansion tower. (See “Expansion Tower Power Procedure” on page 871.)

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ The failing item is the tower card (TWRCARD), which you have already exchanged.

Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.

- 8. Remove the tower card (TWRCARD) that you installed in the previous step and install the original tower card.
- 9. Install the cards you removed in step 2 of this procedure one card group at a time in the order that is shown in Table 21.

Note: Power off the expansion tower before installing each card group. After you install each card group, power on the expansion tower.

Table 21. Install

FC 5065
I/O Processor in C03, I/O Adapters in C01, C02, C04 and C05
I/O Processor in C08, I/O Adapters in C06, C07, C09 and C10
I/O Processor in C13, I/O Adapters in C11, C12, C14 and C15

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ Repeat this step until the SRC or failure that sent you to this procedure occurs.

Bus PIPs

If the error does not occur, the problem may be intermittent. Ask your next level of support for assistance.

This ends the procedure.

10. Perform "BUS-PIP5" on page 265 for the last card group that you reinstalled in step 9 of this procedure.

Note: If BUS-PIP5 does not identify the failing item, return here and continue with the next step of this procedure.

11. Perform the following:
 - a. Power off the expansion tower. (See "Expansion Tower Power Procedure" on page 871.)
 - b. Exchange the I/O processor card you last reinstalled in step 9 of this procedure with a new I/O processor card of the same type.
 - c. Power on the expansion tower. (See "Expansion Tower Power Procedure" on page 871.)

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ The failing item is the I/O processor card, which you have just exchanged.

Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

12. Perform the following:
 - a. Power off the expansion tower. (See "Expansion Tower Power Procedure" on page 871.)
 - b. Remove the last card that you exchanged.
 - c. Install the original I/O processor card and the attached adapter cards.

13. Perform the following:
 - a. Use the Table 21 on page 303 and the I/O processor card with the position that you previously reinstalled.
 - b. Exchange this I/O processor card.
 - c. Power on the expansion tower. (See "Expansion Tower Power Procedure" on page 871.)

Does the Entry Point SRC or error occur?

Note: If the system has logical partitions, when looking for the entry point SRC, check first in the logical partition which reported the problem. Then check all other logical partitions that own I/O processor card resources on the bus.

Yes No

↓ The failing item is the I/O processor card, which you have already exchanged.

Go to "BUS-PIP8" on page 294 to verify the repair.

This ends the procedure.

14. Perform the following:
 - a. Power off the expansion tower. (See “Expansion Tower Power Procedure” on page 871.)
 - b. Remove the I/O processor card you installed in the previous step.
 - c. Install the original I/O processor card.
15. The only failing item remaining is the tower card (TWRCARD).
Perform the following:
 - a. Exchange the tower card (TWRCARD). Go to “TWRCARD” on page 582.
 - b. Go to “BUS-PIP8” on page 294 to verify the repair.

This ends the procedure.**BUS-PIP11**

Introduction: This procedure uses the optical cable wrap plug, PN 75G2725, to verify the function of an SPD bus optical cable. **PN 75G2725 can not be used on early optical cables (early 3xx systems, this cable has the optics connector oriented 90 degrees).** In this procedure you will determine and record one of these conditions for the proper function of the optical cable:

- The cable is **functioning properly**.
- The cable is **failing**.
- The proper function of the cable **cannot be determined**.

Procedure:

1. Do you have the optical cable wrap plug, PN 75G2725?

Yes No

- ↓ You cannot perform this procedure. Record that the proper function of the optical cable **cannot be determined**. Return to the procedure, symbolic FRU or FI that sent you here.

This ends the procedure.

2. Perform the following:
 - a. Power on the system if it is not already powered on.
 - b. Power off the I/O tower for the failing bus. See “Expansion Tower Power Procedure” on page 871.
 - c. Disconnect the optical cable from the remote SPD optical bus receiver card for the failing bus.
 - d. Install the optical cable wrap plug on the optical cable at the end you disconnected.
3. Search the Product Activity Log of the Primary partition for a B600 699C.

Note: Search the Primary partition even if the system has multiple partitions.

Does SRC B6xx 699C occur in the Product Activity Log for the bus you are working on at a time that was during the IPL?

No Yes

- ↓ Record that the optical cable is **functioning properly**. Go to step 9 on page 306 of this procedure.
4. The local SPD optical bus driver card must be tested.

Bus PIPs

Note: This step requires an SPD optical bus driver card terminator (PN 16G5609). If you do not have a terminator you can use an SPD optical bus driver terminator from an unused optical bus port by exchanging it with the cable you put the optical cable wrap plug on.

Is an SPD optical bus driver card terminator available?

Yes **No**

↓ Record that the proper function of the optical cable **cannot be determined**. Go to step 8 of this procedure.

5. Install the SPD optical bus driver card terminator on the SPD optical bus driver card for the bus you are working on.
6. Search the Product Activity Log of the Primary partition for a B600 699C.

Note: Search the Primary partition even if the system has multiple partitions.

Does SRC B6xx 699C occur in the Product Activity Log for the bus you are working on at a time that was during the IPL?

Yes **No**

↓ Record that the optical cable is **functioning properly**. Go to step 9 of this procedure.

7. Record that the optical cable is **failing**.
8. Perform the following:
 - a. Reinstall any SPD optical bus driver card terminators that you moved during this procedure.
 - b. Remove the optical cable wrap plug.
 - c. Return to the procedure, symbolic FRU or FI that sent you to this procedure.

This ends the procedure.

9. Perform the following:
 - a. Reinstall any SPD optical bus driver card terminators that you moved during this procedure.
 - b. Remove the optical cable wrap plug.
 - c. Reinstall the optical cable.
 - d. Return to the procedure, symbolic FRU or FI that sent you here.

This ends the procedure.

BUS PIP CNSL01

1. Were you directed to this procedure from the Problem Analysis, Repair and Parts document for the system unit which reported the problem?

Yes **No**

↓ Begin this procedure only from the system unit Problem Analysis, Repair and Parts document for the system unit which reported the problem.

This ends the procedure.

2. Determine the card location of the IOP by going to the bus overview section of this document and locate the card position table for the frame type/feature that you recorded using the bus and card logical address that you recorded. Follow

the page reference given at the end of this step. Record the card location for the IOP. Follow this page reference for the Bus "Overview" on page 232 section of this document.

3. Exchange the IOP in that card position by performing the following:
 - a. Go to the "Locations, Addresses and Part Listings" section of this document. Use the reference given in step 3e.
 - b. Within the "Locations, Addresses and Part Listings" section go to the section for the frame type/feature that you recorded.
 - c. Go to the "FRU Locations and Failing Items table" for the frame type/feature that you recorded.
 - d. Locate the card position in the "FRU Locations and Failing Items table" and use the "Removal and Installation Procedure" identified for that card location.
 - e. Follow this reference for the "Expansion Tower Locations and Addresses" on page 687.
Power on the secondary partition.
This ends the procedure.

Bus PIP MAB-02

The problem is in the system unit. Go to this PIP in the system problem analysis guide that sent you here.

Communications Problem Isolation Procedures

Overview

This section contains the procedures necessary to isolate a communications failure.

DANGER

To prevent a possible electrical shock when adding or removing any devices to or from the system, ensure that the power cords for those devices are unplugged before the signal cables are connected or disconnected. If possible, disconnect all power cords from the existing system before you add or remove a device. (RSFTD203)

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

Communications PIPs

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

COMM-PIP1

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

1. 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” in the *AS/400 Service Functions* information.
2. Perform the following:
 - a. Vary off the resources.
 - b. Go to the Start a Service Tool display.
 - c. Select the *Hardware service manager* option.
 - d. Select the *Logical hardware resources* option.
 - e. Select the *System bus resources* option.
 - f. Select the *Resources associated with IOP* option for the attached IOPs in the list until you display the suspected failing hardware.
 - g. Select the *Verify* option on the hardware you want to test.

Note: The *Verify* option may be valid on the IOP, IOA, or port resource. When the *Verify* option 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.

3. Run the IOA/IOP test(s). This may include any of the following:
 - Adapter internal test.
 - Adapter wrap test (requires adapter wrap plug).
 - Processor internal test.
 - Memory test.
 - Serial/parallel port test.

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

No **Yes**

↓ The IOA/IOP is good. Do NOT replace the IOA/IOP. Go to step 5 of this procedure.

4. 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 “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

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

Yes No

↓ Go to step 7 of this procedure.

Verify the external cable by running the cable wrap test.

Note: Wrap plug part numbers can be found in the “Parts Assemblies” on page 761.

Does the cable wrap test complete successfully?

Yes No

↓ The problem is in the cable. Exchange the cable.

This ends the procedure.

6. 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 - go to “Starting Point For All Problems” on page 3 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.

7. 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 - go to “Starting Point for All Problems” 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 Problem Isolation Procedures

Overview

This section contains the procedures necessary to isolate a failure in a disk unit.

Disk Unit PIPs

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 or Expansion Tower” on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

DU-PIP3

Introduction: This procedure determines the system reference code (SRC) to be used to isolate the problem and to determine the failing device.

Note: When exchanging a disk unit, go to “Recovery Procedures” on page 837.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

1. Perform an IPL to dedicated service tool (DST) (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does an SRC appear on the control panel?

No **Yes**

↓ Go to step 6 of this procedure.

2. Does the Disk Configuration Error Report display or the Disk Configuration Warning Report display appear on the console?

Yes **No**

↓ Go to step 4 of this procedure.

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 **Yes**

↓ Select option 5, then press F11, then press the Enter key to display the details.

If all of the reference codes are 0000, go to “LIC-PIP11” on page 337 and use cause code 0002. If any of the reference codes are not 0000, go to step 6 of this procedure 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. Does the Display Failing System Bus display appear on the console?

No **Yes**

↓ Use the reference code that is displayed under *Reference Code* to correct the problem.

This ends the procedure.

5. Look at all the Product Activity Logs by using the *Product activity log* option under DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Is an SRC logged as a result of this IPL?

Yes 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 “Chapter 2. Unit Reference Codes” on page 17). If the failing item list contains FI codes, see “Failing Items” on page 539 to help determine part numbers and location in the system.

This ends the procedure.

6. Record the SRC on the Problem Summary Form (see “Appendix A. Problem Summary Form” on page 895).

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

Yes No

- ↓ Go to “Starting Point For All Problems” on page 3 to correct the problem.

This ends the procedure.

7. Perform the following:

- Power off the system or expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- See “Failing Items” on page 539 to find the devices identified by FI code FI01106.
- 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 Yes

- ↓ Go to step 12 of this procedure.

9. Does the Disk Configuration Error Report display or the Disk Configuration Warning Report display appear on the console 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 No

- ↓ Go to step 11 of this procedure.

10. Select option 5, then press F11, then press the Enter key to display details.
Does an SRC appear in the Reference Code column?

No Yes

- ↓ Go to step 12 of this procedure.

11. Look at all the Product Activity Logs by using the *Product activity log* option under DST.

Is an SRC logged as a result of this IPL?

Disk Unit PIPs

Yes 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 "Recovery Procedures" on page 837).

This ends the procedure.

12. Record the SRC on the Problem Summary Form (see "Appendix A. Problem Summary Form" on page 895).

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

No Yes

↓ The last device you disconnected is not the failing item.

- a. Leave the device disconnected and go to step 7 of this procedure 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 16 of this procedure.

13. Does the Disk Configuration Error Report display or the Disk Configuration Warning Report display appear on the console 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 No

↓ Go to step 13 of this procedure.

14. Select option 5 then press F11, then press the Enter key to display details. Are all the reference codes 0000?

No 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 "Disk Unit" in "Chapter 4. Removal and Installation Procedures" on page 593.

This ends the procedure.

15. Use the reference code to correct the problem.

This ends the procedure.

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

Yes 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 (see the failing item list for this reference code in "Chapter 2. Unit Reference Codes" on page 17). If the failing item list contains FI codes, see "Failing Items" on page 539 to help determine part numbers and location in the system.

This ends the procedure.

17. 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 (see the failing item list for this reference code in “Chapter 2. Unit Reference Codes” on page 17). If the failing item list contains FI codes, see “Failing Items” on page 539 to help determine part numbers and location in the system.

This ends the procedure.

Intermittent Problem Isolation Procedures

Introduction

These intermittent problem isolation procedures instruct you to perform procedures to help you correct an intermittent problem.

Use these procedures only if problem analysis steps or tables sent you here.

Perform only 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 tower where the FRU is located, (see “Powering On and Powering Off the System or Expansion Tower” on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

INT-PIP3 External Noise on AC Voltage Lines

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

DANGER

To prevent a possible electrical shock when adding or removing any devices to or from the system, ensure that the power cords for those devices are unplugged before the signal cables are connected or disconnected. If possible, disconnect all power cords from the existing system before you add or remove a device. (RSFTD203)

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

Could lightning have caused the failure?

Yes No

↓ Go to step 3 of this procedure.

2. Determine if lightning protection devices are installed on the incoming ac voltage lines where they enter the building.

Note: There must be a dedicated ground wire from the lightning protection devices to earth ground.

Intermittent PIPs

Are lightning protection devices installed?

Yes No

↓ Lightning may have caused the intermittent problem. Recommend that the customer install lightning protection devices to prevent this problem from occurring again.

This ends the procedure.

3. *An installation planning representative should perform this step.*
 - a. Get a recording ac voltage monitor. Connect it 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?

Yes No

↓ **This ends the procedure.**

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 No

↓ Perform the next INT-PIP listed in the *INT-PIP* column.

This ends the procedure.

5. 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 AS/400 system.

This ends the procedure.

INT-PIP5 External Noise on Twinaxial Cables

DANGER

To prevent a possible electrical shock when adding or removing any devices to or from the system, ensure that the power cords for those devices are unplugged before the signal cables are connected or disconnected. If possible, disconnect all power cords from the existing system before you add or remove a device. (RSFTD203)

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

Electrical noise on twinaxial cables that are not installed correctly may affect the twinaxial workstation I/O processor card. Examples are: Open shields on twinaxial cables and station protectors that are not being installed where necessary.

1. Check for the following on the system:
 - There must be no more than 11 breaks in a twinaxial cable run.
 - Station protectors must be installed (in pairs) where a cable enters or leaves a building.

Intermittent PIPs

- There can be only 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.
2. See chapter 9 in the *AS/400 Technical Information Manual SY44-0008*, and use it to check for any cable problems.
 3. For more information, see the *IBM 5250 Information Display Systems — Planning and Site Preparation Guide, GA21-9337*.

This ends the procedure.

INT-PIP7 Electromagnetic Interference (EMI)

This procedure contains actions to lessen the effects of electrical noise on the system.

1. Ensure that air flow cards are installed in all full-size card slots and 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.
4. *It is recommended that an installation planning representative perform the following steps.*

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).

5. Use a radio frequency (RF) field intensity meter to determine if there is an unusual amount of RF noise near the AS/400 system. You can also use it to help determine the source of the noise.

This ends the procedure.

INT-PIP8 Grounding

This procedure contains actions to ensure that the system is electrically grounded correctly.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the products that attach to the system. It is the customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (RSFTD201)

An installation planning representative must perform all of the steps in this procedure.

Notes:

1. Power off the AS/400 system and the power network branch circuits before performing this procedure.
2. The customer may have to get an electrician to perform some of the steps in this procedure.
3. Read *Electrical Safety for IBM Service Representatives, S229-8124*.

Intermittent PIPs

4. To ensure the safety of personnel, all electrical wiring in the United States must meet National Electrical Code requirements.
1. Check **ALL** system receptacles to ensure that each one is wired correctly. This includes receptacles for the AS/400 system and all equipment that attaches to the AS/400 system—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. Use the procedures for checking receptacles in *Electrical Safety for IBM Service Representatives*, S229-8124.
2. 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.
3. 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 (uninterruptible 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 AS/400 system must be connected together.

Intermittent PIPs

This applies to the first electrically isolating unit that is found in the path of electrical wiring from the AS/400 system to the service entrance power panel. This isolating unit is sometimes referred to as a **separately derived source**. It can be an uninterruptible 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.

4. 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 3 of this procedure.
5. For systems with more than one unit, the ground wire for each must not be connected from one receptacle to the next in a string. Each unit must have its own ground wire, which goes to the power source.
6. The grounding wires must be 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.
7. If extension-mainline power cables or multiple-outlet power strips are used, 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 AS/400 system. 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.

INT-PIP9 Utility Power and Battery Power Units

This procedure contains actions to check the ac electrical power for the system.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the products that attach to the system. It is the customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (RSFTD201)

An installation planning representative must perform all of the steps in this procedure.

Notes:

1. Power off the AS/400 system and the power network branch circuits before performing this procedure.
2. The customer may have to get an electrician to perform some of the steps in this procedure.

Intermittent PIPs

3. Read *Electrical Safety for IBM Service Representatives*, S229-8124.
4. To ensure the safety of personnel, all electrical wiring in the United States must meet National Electrical Code requirements.
 1. Check **ALL** system receptacles to ensure that each is wired correctly. This includes receptacles for the AS/400 system and all equipment that attaches to the AS/400 system-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. Use the procedures for checking receptacles in *Electrical Safety for IBM Service Representatives*, S229-8124.
 2. When three-phase voltage is used to provide power to the AS/400 system, correct balancing of the load on each phase is important. Each unit in the AS/400 system uses only two of the three phases. Therefore, the units should be connected so that all three phases are used equally. Use the following as a guide to help balance the phases:
 - Connect a unit across phases A and B
 - Connect a unit across phases B and C
 - Connect a unit across phases A and C
 - Continue in this sequence for additional units
 3. The power distribution neutral must return to the “separately derived source” through an insulated wire that is the same size as the phase wire or larger.

Note: “Separately derived source” is defined in INT-PIP8 Grounding, step 4 on page 317.

4. The AS/400 system and its attached equipment should be the only units that are connected to the power distribution network that the system gets its power.
5. The equipment that is attached to the AS/400 system, such as workstations and printers, must be attached to the power distribution network for the system when possible.
6. Each unit in the AS/400 system must have a circuit breaker that controls only the ac voltage to that unit. No other equipment may get its ac voltage from the same circuit breaker.
7. Check all circuit breakers in the network that supply ac power to the AS/400 system 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.
8. 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 AS/400 system. The reason for this is that this

equipment generates ac noise pulses. These pulses can get into the ac voltage for the AS/400 system and cause intermittent problems.

9. Measure the ac voltage to each unit to ensure that it is in the normal range. Is the voltage outside the normal range?

No **Yes**

↓ Contact the customer to have the voltage source returned to within the normal voltage range.

10. *The remainder of this procedure is only for an AS/400 system that is attached to a separately derived source.*

Some examples of separately derived sources are an uninterruptible 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 uninterruptible 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 uninterruptible 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 uninterruptible power supply can be used over its maximum capacity if it has a low peak repetitive current specification, and the uninterruptible power supply is already fully loaded. Therefore, a derating factor for the uninterruptible power supply must be calculated to allow for the peak-repetitive current of the complete system. To help you determine the derating factor for an uninterruptible power supply, use the following:

Note: The peak-repetitive current is different from the “surge” current that occurs when the AS/400 system is powered on.

The derating 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 uninterruptible power supply that is divided by the RMS current rating of the uninterruptible power supply.

Note: If you do not know the crest factor of the uninterruptible power supply, assume that it is 1.414.

- RMS load current is the steady state RMS current of the AS/400 system as determined by the power profile.
- Peak load current is the steady state peak current of the AS/400 system as determined by the power profile.

For example, if the derating factor of the uninterruptible power supply is calculated to be 0.707, then the uninterruptible power supply must not be used more than 70.7% of its kVA-rated capacity. If the kVA rating of the uninterruptible 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 2 of this procedure is *critical*. If the load on any one

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phase of an uninterruptible power supply is more than the load on the other phases, the voltage on all phases may be reduced.

11. If the system is attached to an uninterruptible 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 uninterruptible power supply or motor generator. Equipment such as air conditioners, copiers, and FAX machines should not be attached to the same uninterruptible 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 uninterruptible power supply or motor generator to which the system is attached.

This ends the procedure.

INT-PIP14 Station Protectors

Station protectors must be installed on all twinaxial cables that leave the building in which the AS/400 system 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 AS/400 system.

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?

No **Yes**

↓ Perform the next INT-PIP listed in the *INT-PIP* column.

This ends the procedure.

3. You may need to install station protectors on the twinaxial cables to the failing workstations. See chapter 9, section F in the *AS/400 Technical Information Manual*, SY44-0008, for additional information on station protectors.

This ends the procedure.

INT-PIP16 Licensed Internal Code

Sometimes a dump of main storage is needed to analyze the problem. The data on the dump is analyzed at the AS/400 system factory to determine the cause of the problem and how to correct it.

1. Copy the main storage dump to tape (see "Copying a Main Storage Dump" in the *AS/400 Service Functions* information).
2. Ask your next level of support to determine if a Licensed Internal Code trouble report (LICTR) needs to be written.

This ends the procedure.

INT-PIP18 PTFs Not Installed

One or more PTFs may be available to correct this specific problem.

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

Note: Ensure that the latest IOP PTF has been installed before you exchange an IOP card.

2. Ask your next level of support for more information.

This ends the procedure.

INT-PIP20 Performance Problems

This procedure analyzes system performance problems.

1. Look at the Product Activity Log and 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?

No **Yes**

↓ Correct the hardware errors.

This ends the procedure.

2. The performance problems are not related to hardware.
3. Perform the following:
 - a. Ask the customer if they have asked software level one 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 a system engineer analyze the conditions.
 - d. Inform the customer that IBM has a Performance Tools Licensed Program Product (5728-PT1) for sale. This helps determine the areas of the system that need tuning.

This ends the procedure.

INT-PIP24 Service Processor Data Collection

The service processor reported a suspected intermittent problem. It is important that you collect data for this problem so that the problem can be corrected. This procedure tells you how to collect the data.

Note: Do not perform an IPL until you perform an IOP dump of the service processor.

To get an IOP dump of the service processor, perform the following:

1. Record the complete system reference code (SRC) (functions 11 through 13 and 20) on the Problem Summary Form (see "Appendix A. Problem Summary Form" on page 895).
2. To start an IOP dump of the service processor, do the following:
 - a. Select function 25 and press the Enter key.
 - b. Select function 26 and press the Enter key to enable functions 54 through 70.
 - c. Select function 70 (CFIOP Storage Dump) on the control panel and press the Enter key.
 - d. Wait for the completion SRC, 11 B100 8ABF, or 11 A1xx 8ABF, to appear on the control panel.

The data is now written to disk. The following steps explain how to collect the storage dump from disk.

3. Perform the following:
 - a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
 - b. Power on the system in Manual mode.

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- c. Wait for the system to complete the IPL to dedicated service tool (DST) (the control panel SRCs go beyond C6xx 4103).

Is a display shown on the console?

Yes **No**

↓ The problem is not intermittent.

If you were sent here from Chapter 2. Unit Reference Codes, return there and follow the procedure for a problem that is not intermittent.

Note: You may collect the storage dump data by performing "Low Level Debug and Data Collecting Procedures" in the *AS/400 Service Functions* information.

This ends the procedure.

4. The problem is intermittent.
Save the IOP dump to tape (see "Copying the IOP Storage Dump to Removable Media" in the *AS/400 Service Functions* information).
5. Complete the IPL.
6. Go to the "General Intermittent Problem Checklist" in the system Problem Analysis Guide (either *AS/400e server 270, and 820 Problem Analysis, Repair and Parts* or *AS/400e server 830, 840, SB2, and SB3 Problem Analysis, Repair and Parts*) to find available PTFs for this problem. Follow the steps to find and apply a program temporary fix (PTF) for this problem (see the PTF summary list to find PTFs with this SRC symptom).

Then return here and answer the following question.

Did you find and apply a PTF for this problem?

No **Yes**

↓ **This ends the procedure.**

7. Ask your next level of support for assistance and provide the following:
 - The complete SRC you recorded in this procedure
 - The IOP dump to tape you obtained in step 4 of this procedure
 - 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 (see "APAR or LICTR" in the *AS/400 Service Functions* information)

This ends the procedure.

Licensed Internal Code (LIC) Problem Isolation Procedures

Overview

This section contains the procedures necessary to isolate Licensed Internal Code reference code problems.

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 or Expansion Tower" on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

Read and understand the following service procedures before using this section:

- “Powering On and Powering Off the System or Expansion Tower” on page 868.
- IPL instructions in *AS/400 Service Functions*.

LIC-PIP1**Introduction:**

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

LIC detected an IOP programming problem. Data must be gathered 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.**

1. Is the system operational (did the SRC come from the Service Action Log, Product Activity Log, problem log, or system operator message)?

Yes No

↓ Go to step 9 of this procedure.

2. Is this a x6xx5121 SRC?

No Yes

↓ Go to step 4 of this procedure.

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 “Copying the IOP Storage Dump to Removable Media” in the *AS/400 Service Functions* information).
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.

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6. Copy the system configuration list (see “Hardware Service Manager, Printing the System Configuration List” in the *AS/400 Service Functions* information).
7. Provide the dumps to IBM 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 “Using the Service Action Log” on page 12). Use the new SRC and go to “Chapter 2. Unit Reference Codes” on page 17.
 - If there are no new SRCs in the Service Action Log, go to “BUS-PIP1 (5077)” on page 244.

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 No
↓ Go to step 15 of this procedure.
10. Complete a Problem Summary Form using the information from functions 11 through 20 on the control panel, or from the DST Main Storage Dump screen (see “Error Recovery for Dumps, Reporting the Error” in the *AS/400 Service Functions* information).
11. The system has already taken a partial main storage dump for this SRC and automatically re-IPLed to DST (see “Automatic Main Storage Dump” in the *AS/400 Service Functions* information).
12. Copy the main storage dump to tape (see “Copying a Main Storage Dump” in the *AS/400 Service Functions* information).
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 of this procedure.
14. Provide the dumps to IBM Service Support.
This ends the procedure.
15. Has the system stopped with an SRC at the control panel?
Yes No
↓ Go to step 1 of this procedure.
16. Complete a Problem Summary Form using the information from functions 11 through 20 on the control panel, or from the DST Main storage dump screen (see “Error Recovery for Dumps, Reporting the Error” in the *AS/400 Service Functions* information).
17. IPL to DST and start the Main storage dump manager service function.
18. Copy the main storage dump to tape (see “Copying a Main Storage Dump” in the *AS/400 Service Functions* information).
19. Obtain the data in steps 3, 4, 5, and 6 of this procedure.
20. Re-IPL the system.
21. Has the system stopped with an SRC at the control panel?
Yes No
↓ Provide the dumps to IBM Service Support.

This ends the procedure.

22. Use the new SRC and go to “Chapter 2. Unit Reference Codes” on page 17.

This ends the procedure.

LIC-PIP3 (503x)

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Dedicated service tools (DST) found a permanent program error, or a hardware failure occurred.

Read the “Overview” on page 322 before continuing with this procedure.

1. Does URC 50FF occur?

No Yes

↓ Go to step 3 of this procedure.

2. Perform a main storage dump, then perform an IPL by doing the following:
- Perform a main storage dump (see “Perform a Main Storage Dump to Disk” in the *AS/400 Service Functions* information).
 - Select manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).
 - When the IPL has completed, the system console should be at the DST display. If the DST display does not appear on the system console, go to “BUS-PIP1 (503x)” on page 238. Otherwise, go to step 6 of this procedure.
3. Perform a main storage dump, then perform an IPL by doing the following:
- Perform a main storage dump (see “Perform a Main Storage Dump to Disk” in the *AS/400 Service Functions* information).
 - Select manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does a display appear?

No Yes

↓ Go to step 6 of this procedure.

4. If the problem is in the Primary partition, exchange the first workstation I/O processor card on bus 1 (see “Chapter 4. Removal and Installation Procedures” on page 593). If the problem is in the secondary partition, exchange the I/O processor card for the console of the secondary partition. To locate a secondary partition’s console and workstation I/O processor, see *AS/400 Service Functions*.
5. Select manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Is the IPL or Install the System display shown?

Yes No

↓ Ask your next level of support for assistance and report the problem.

This ends the procedure.

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6. Copy the main storage dump to removable media (see “Copying a Main Storage Dump” in the *AS/400 Service Functions* information).
7. Report a Licensed Internal Code problem to your next level of support.
This ends the procedure.

LIC-PIP3 (5077)

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Dedicated service tools (DST) found a permanent program error, or a hardware failure occurred.

Read the “Overview” on page 322 before continuing with this procedure.

1. Does URC 50FF occur?
No Yes
↓ Go to step 3 of this procedure.
2. Perform a main storage dump, then perform an IPL by doing the following:
 - a. Perform a main storage dump (see “Perform a Main Storage Dump to Disk” in the *AS/400 Service Functions* information).
 - b. Select manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).
 - c. When the IPL has completed, the system console should be at the DST display. If the DST display does not appear on the system console, go to “BUS-PIP1 (5077)” on page 244. Otherwise, go to step 6 of this procedure.
3. Perform a main storage dump, then perform an IPL by doing the following:
 - a. Perform a main storage dump (see “Perform a Main Storage Dump to Disk” in the *AS/400 Service Functions* information).
 - b. Select manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does a display appear?

No Yes

↓ Go to step 6 of this procedure.

4. If the problem is in the Primary partition exchange the first workstation I/O processor card on bus 1 (see “Chapter 4. Removal and Installation Procedures” on page 593). If the problem is in the secondary partition, exchange the I/O processor card for the console of the secondary partition. To locate a secondary partition’s console and workstation I/O processor, see *AS/400 Service Functions*.
5. Select manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Is the IPL or Install the System display shown?

Yes No

↓ Ask your next level of support for assistance and report the problem.

This ends the procedure.

6. Copy the main storage dump to removable media (see “Copying a Main Storage Dump” in the *AS/400 Service Functions* information).
7. Report a Licensed Internal Code problem to your next level of support.

This ends the procedure.

LIC-PIP4 (503x)

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

The 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 “Overview” on page 322 before continuing with this procedure.

1. Select function 21 (Make DST Available) on the control panel and press the Enter key to start DST again.
Does the DST Sign On display appear?
Yes No
↓ Go to step 3 of this procedure.
2. Perform the following (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information):
 - a. Select the *Start a Service Tool* option.
 - b. Select the *Licensed Internal Code log* option.
 - c. Perform a dump of the Licensed Internal Code log to tape (see “Work with Licensed Internal Code Log” in the *AS/400 Service Functions* information).
 - d. Return here and continue with the next step of this procedure.
3. Perform a main storage dump (see “Perform a Main Storage Dump to Disk” in the *AS/400 Service Functions* information).
4. Copy the main storage dump to removable media (see “Copying a Main Storage Dump” in the *AS/400 Service Functions* information).
5. Report a Licensed Internal Code problem to your next level of support.
This ends the procedure.

LIC-PIP4 (5077)

Introduction: The 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.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

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Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 322 before continuing with this procedure.

1. Select function 21 (Make DST Available) on the control panel and press the Enter key to start DST again.

Does the DST Sign On display appear?

Yes No

↓ Go to step 3 of this procedure.

2. Use the full-authority password to sign on to DST. Perform the following (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information):
 - a. Select the *Start a Service Tool* option.
 - b. Select the *Licensed Internal Code log* option.
 - c. Perform a dump of the Licensed Internal Code log to tape (see “Work with Licensed Internal Code Log” in the *AS/400 Service Functions* information).
 - d. Return here and continue with the next step of this procedure.
3. Perform a main storage dump (see “Perform a Main Storage Dump to Disk” in the *AS/400 Service Functions* information).
4. Copy the main storage dump to removable media (see “Copying a Main Storage Dump” in the *AS/400 Service Functions* information).
5. Report a Licensed Internal Code problem to your next level of support.

This ends the procedure.

LIC-PIP7 (503x)

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

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 “Overview” on page 322 before continuing with this procedure.

1. Did a previous procedure have you power off the system then perform an IPL in Manual mode, **and** is the system in Manual mode now?

No Yes

↓ Go to step 3 of this procedure.

2. Perform the following:
 - a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Select Manual mode on the control panel (see *AS/400 Service Functions*).
 - c. Power on the system.
3. Does the SRC that sent you to this procedure appear on the control panel?

No Yes

- ↓ Use the information in the SRC to determine the card direct select address. If the SRC is B6006910, you can use characters 9-16 of the top 16 character line of function 13 (word 7) to find the direct select address in BBBBCcbb format.

BBBB Bus number

Cc Card direct select address

bb board address

Go to step 14 of this procedure.

4. Does the console display indicate a problem with missing disks?

Yes No

- ↓ Go to step 7 of this procedure.

5. Perform the following:

- a. Go to the DST main menu.
- b. On the DST sign-on display, enter the DST full authority user ID and password (see "Accessing Dedicated Service Tools" in the *AS/400 Service Functions* information).
- c. Select the Start a service tool option.
- d. Select the Hardware service manager option.
- e. Check for the SRC in the service action log (see "Using the Service Action Log" on page 12).
- f. Did you find the same SRC that sent you to this procedure?

No 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 12 of this procedure.

6. Perform the following:

- a. Return to the DST main menu.
- b. Perform an IPL and return to the Display Missing Disk Units display.
- c. Go to "LIC-PIP11" on page 337.

This ends the procedure.

7. Does the SRC that sent you to this procedure appear on the console or on the alternative console?

No Yes

- ↓ Go to step 9 of this procedure.

8. Does the IPL complete successfully to the IPL or Install the System display?

Yes No

- ↓ A different SRC occurred. Go to "Chapter 2. Unit Reference Codes" on page 17 and use the new SRC to correct the problem.

This ends the procedure.

9. 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.

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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?

No **Yes**

↓ Go to step 13.

10. Did you find a different SRC than the one that sent you to this procedure?

Yes **No**

↓ The problem appears to be intermittent. Ask your next level of support for assistance.

This ends the procedure.

11. Use the new SRC to correct the problem. See "Chapter 2. Unit Reference Codes" on page 17.

This ends the procedure.

12. 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 **Yes**

↓ Go to step 15 of this procedure.

13. Perform the following:

- 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 B600 6910, use characters 9-16 of the top 16 character line of function 13 (word 7) of the System Reference Code Data to find the card direct select address in BBBBCcbb format.

BBBB Bus number

Cc Card direct select address

bb board address

14. Use the BBBBCcbb information and refer to "Expansion Tower Locations and Addresses" on page 687 to determine the failing IOP and its location.

15. Go to "BUS-PIP5" on page 265 to isolate an I/O adapter problem on the IOP you just identified.

If that procedure fails to isolate the problem, return here and continue with the next step of this procedure.

16. Is the I/O processor card you identified in step 12 or step 14 of this procedure the CFIOP?

No **Yes**

↓ Exchange the failing CFIOP card (see "Chapter 4. Removal and Installation Procedures" on page 593).

Note: You will be prompted for the system serial number. Ignore any error messages regarding system configuration that appear during the IPL.

Go to step 19 of this procedure.

17. Perform the following:
 - 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 Yes

- ↓ Perform the following:
- a. Power off the system.
 - b. Install the IOP card you just removed.
 - c. Go to "BUS-PIP1 (503x)" on page 238

This ends the procedure.

18. Perform the following:
 - a. Power off the system.
 - b. Exchange the failing IOP card.
19. 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 Yes

- ↓ Go to step 22 of this procedure.

20. Does a different SRC appear on the control panel, on the console, or on the alternative console?

No Yes

- ↓ Go to "Chapter 2. Unit Reference Codes" on page 17 and use the new SRC to correct the problem.

This ends the procedure.

21. The IPL or Install the System display is on the console.
Check for the SRC in the service action log (see "Using the Service Action Log" on page 12).
Did you find the same SRC that sent you to this procedure?

Yes No

- ↓ Go to "BUS-PIP8" on page 294.

This ends the procedure.

22. Perform the following:
 - a. Power off the system.
 - b. Remove the IOP card you just exchanged and install the original card.
 - c. Go to "BUS-PIP1 (503x)" on page 238.

This ends the procedure.

23. 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 *AS/400 Service Functions* information:

- Copy the main storage dump from disk to tape or diskette.

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- Print the product activity log.
- Copy the IOP storage dump to removable media.

This ends the procedure.

LIC-PIP7 (5077)

Introduction: 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.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 322 before continuing with this procedure.

1. Did a previous procedure have you power off the system then perform an IPL in Manual mode, **and** is the system in Manual mode now?

No **Yes**

↓ Go to step 3 of this procedure.

2. Perform the following:
 - a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Ensure keystick is inserted and select Manual mode on the control panel.
 - c. Power on the system.
3. Does the SRC that sent you to this procedure appear on the control panel?

No **Yes**

↓ Use the information in the SRC to determine the card direct select address. If the SRC is B6006910, you can use characters 9-16 of the top 16 character line of function 13 (word 7) to find the direct select address in BBBBCcbb format.

BBBB Bus number

Cc Card direct select address

bb board address

Go to step 14 of this procedure.

4. Does the console display indicate a problem with missing disks?

Yes **No**

↓ Go to step 7 of this procedure.

5. Perform the following:
 - a. Go to the DST main menu.
 - b. On the DST sign-on display, enter the DST full authority user ID and password (see “Accessing Dedicated Service Tools” in the *AS/400 Service Functions* information).
 - c. Select the Start a service tool option.
 - d. Select the Hardware service manager option.

- e. Check for the SRC in the service action log (see “Using the Service Action Log” on page 12).
- f. Did you find the same SRC that sent you to this procedure?

No 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 12 of this procedure.

- 6. Perform the following:
 - a. Return to the DST main menu.
 - b. Perform an IPL and return to the Display Missing Disk Units display.
 - c. Go to “LIC-PIP11” on page 337.

This ends the procedure.

- 7. Does the SRC that sent you to this procedure appear on the console or on the alternative console?

No Yes

- ↓ Go to step 9 of this procedure.

- 8. Does the IPL complete successfully to the IPL or Install the System display?

Yes No

- ↓ A different SRC occurred. Go to “Chapter 2. Unit Reference Codes” on page 17 and use the new SRC to correct the problem.

This ends the procedure.

- 9. 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?

No Yes

- ↓ Go to step 13 on page 334.

- 10. Did you find a different SRC than the one that sent you to this procedure?

Yes No

- ↓ The problem appears to be intermittent. Ask your next level of support for assistance.

This ends the procedure.

- 11. Use the new SRC to correct the problem. See “Chapter 2. Unit Reference Codes” on page 17.

This ends the procedure.

- 12. 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 Yes

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↓ Go to step 15 of this procedure.

13. Perform the following:
 - 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 B600 6910, use characters 9-16 of the top 16 character line of function 13 (word 7) of the System Reference Code Data to find the card direct select address in BBBBCcbb format.

BBBB Bus number

Cc Card direct select address

bb board address

14. Use the BBBBCcbb information and refer to "Expansion Tower Locations and Addresses" on page 687 to determine the failing IOP and its location.
15. Go to "BUS-PIP5" on page 265 to isolate an I/O adapter problem on the IOP you just identified.

If that procedure fails to isolate the problem, return here and continue with the next step of this procedure.

16. Is the I/O processor card you identified in step 12 or step 14 of this procedure the CFIOIP?

No **Yes**

↓ Exchange the failing CFIOIP card (see "Chapter 4. Removal and Installation Procedures" on page 593).

Note: You will be prompted for the system serial number. Ignore any error messages regarding system configuration that appear during the IPL.

Go to step 19 of this procedure.

17. Perform the following:
 - 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 **Yes**

↓ Perform the following:

- a. Power off the system.
- b. Install the IOP card you just removed.
- c. Go to "BUS-PIP1 (5077)" on page 244

This ends the procedure.

18. Perform the following:
 - a. Power off the system.
 - b. Exchange the failing IOP card.
19. 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 **Yes**

↓ Go to step 22 of this procedure.

20. Does a different SRC appear on the control panel, on the console, or on the alternative console?

No **Yes**

↓ Go to “Chapter 2. Unit Reference Codes” on page 17 and use the new SRC to correct the problem.

This ends the procedure.

21. The IPL or Install the System display is on the console.
Check for the SRC in the Service Action Log (see “Using the Service Action Log” on page 12).
Did you find the same SRC that sent you to this procedure?

Yes **No**

↓ Go to “BUS-PIP8” on page 294.

This ends the procedure.

22. Perform the following:
- a. Power off the system.
 - b. Remove the IOP card you just exchanged and install the original card.
 - c. Go to “BUS-PIP1 (5077)” on page 244.

This ends the procedure.

23. 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 *AS/400 Service Functions* information:

- Copy the main storage dump from disk to tape or diskette.
- Print the Product Activity Log.
- Copy the IOP storage dump to removable media.

This ends the procedure.

LIC-PIP8 (503x)

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Licensed Internal Code detected an operating system program problem.

Read the “Overview” on page 322 before continuing with this procedure.

1. Select manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does the same SRC occur?

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No **Yes**

↓ Go to step 6 of this procedure.

2. Does the same URC appear on the console?

No **Yes**

↓ Go to step 5 of this procedure.

3. Does a different SRC occur, or does a different URC appear on the console?

No **Yes**

↓ Use the new SRC or reference code to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17). If the procedure for the new SRC sends you back to this procedure, go to step 5.

This ends the procedure.

4. Select the *Perform an IPL* option on the IPL or Install the System display to complete the IPL.

Is the problem intermittent?

Yes **No**

↓ **This ends the procedure.**

5. Copy the main storage dump to removable media (see “Copying a Main Storage Dump” in the *AS/400 Service Functions* information).

6. Report a Licensed Internal Code problem to your next level of support.

This ends the procedure.

LIC-PIP8 (5077)

Introduction: Licensed Internal Code detected an operating system program problem.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 322 before continuing with this procedure.

1. Select manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does the same SRC occur?

No **Yes**

↓ Go to step 6 of this procedure.

2. Does the same URC appear on the console?

No **Yes**

↓ Go to step 5 of this procedure.

3. Does a different SRC occur, or does a different URC appear on the console?

No **Yes**

↓ Use the new SRC or reference code to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17). If the procedure for the new SRC sends you back to this procedure, go to step 5.

This ends the procedure.

- Select the *Perform an IPL* option on the IPL or Install the System display to complete the IPL.

Is the problem intermittent?

Yes **No**

- ↓ If a different SRC occurs, or a different URC appears on the console, use the new SRC or reference code to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17). If the procedure for the new SRC sends you back to this procedure, go to 5.

This ends the procedure.

- Copy the main storage dump to removable media (see “Copying a Main Storage Dump” in the *AS/400 Service Functions* information).
- Report a Licensed Internal Code problem to your next level of support.

This ends the procedure.

LIC-PIP11

Introduction: This procedure isolates a system STARTUP failure in the initial program load (IPL) mode.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 322 before continuing with this procedure.

How to Find the Cause Code:

- Were you given a cause code by another procedure?

No **Yes**

- ↓ Use the cause code given by the other procedure.

Go to step 3 of this procedure.

- Look at the Data display characters for word 3. You can find these Data display characters by either:
 - Looking at the information for word 3 on the Problem Summary Form that was filled out earlier.
 - Looking at characters 9-12 of the top 16 character line of function 12 (word 3) on the control panel. These 4 characters are the cause code.
- If the **cause code** is:

0001: Disk configuration is missing.

- Select Manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does the Disk Configuration Error Report display appear?

Yes **No**

- ↓ The IPL completed successfully.

This ends the procedure.

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2. Is Missing Disk Configuration information displayed?

Yes No

↓ Go to step 1 for cause code 0002.

3. Select option 5 on the *Missing Disk Configuration* display.

Select the *Display Detailed Report* option and follow the instructions to:

- a. Select the *Work with disk units* option.
- b. Select the *Work with disk unit recovery* option.
- c. Select the *Recover Configuration* option and follow the instructions on the display.

Note: 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. See "Hardware SRC Formats" in the *AS/400 Service Functions*.

1. Did you enter this procedure because all the devices listed on the Display Missing Units display (reached from the Disk Configuration Error Report or the Disk Configuration Warning Report display) have a reference code of 0000?

No Yes

↓ Go to step 21 of this procedure.

2. Have you installed a new disk enclosure in a disk unit and not restored the data to the disk unit?

No Yes

↓ Ignore SRC A600 5090.

Continue with the disk unit exchange recovery procedure (see "Disk Service Support" in "Recovery Procedures" on page 837).

This ends the procedure.

- 3.

Use the word 1 through 9 and function 20 information recorded on the Problem Summary Form to determine the disk unit that stopped communicating with the system:

- 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) contain the disk unit type, level and model number.
- Characters 9-16 of the top 16 character line of function 13 (word 7) contain the disk unit serial number.

Note: For 9337 Disk Units, the characters 12-16 of the top 16 character line of function 13 contain the disk unit serial number.

- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contain the number of missing disk units.

Are the problem disk units 660x or 671x Disk Units?

No **Yes**

↓ Go to step 5 of this procedure.

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 11 of this procedure:

- 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.

This ends the procedure.

5. Did you enter this procedure because there was an entry in the Service Action Log which has the reference code B6005090?

Yes **No**

↓ Go to step 11 of this procedure.

6. Are customer jobs running on the system now?

Yes **No**

↓ **Attention:** Ensure that the customer is not running any jobs before continuing with this procedure.

Go to step 11 of this procedure.

7. Perform the following:

a. Select System Service Tools (SST).

b. Select the *Work with disk units* option.

c. Select the *Display disk configuration* option.

d. Select the *Display disk configuration status* option.

Are any disk units missing from the configuration?

Note: Missing disk units are indicated by an asterisk (*).

Yes **No**

↓ **This ends the procedure.**

8. Do all of the disk units that are missing from the configuration have a status of "Suspended"?

Yes **No**

↓ **Attention:** Ensure that the customer is not running any jobs before continuing with this procedure.

Go to step 11 of this procedure.

9. Use the Service Action Log to determine if there are any entries for the missing disk units (see "Using the Service Action Log" on page 12).

Are there any entries in the Service Action Log for the missing disk units that were logged since the last IPL?

Yes **No**

↓ Go to step 22 of this procedure.

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10. Use the information in the Service Action Log and go to the SRC information for the specific disk unit in "Chapter 2. Unit Reference Codes" on page 17. Perform the action indicated for the unit reference code.
This ends the procedure.
11. Select Manual mode and perform an IPL to DST (see "Dedicated Service Tools (DST)" in the *AS/400 Service Functions* information).
Does the Disk Configuration Error Report or the Disk Configuration Warning Report display appear?
Yes No
↓ The IPL completed successfully.
This ends the procedure.
12. 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 No**
↓ Go to step 17 of this procedure.
13. Select option 5. If the missing units are Device Parity Protected, do they show a status other than DPY/ACTIVE?
No Yes
↓ Use the Service Action Log to determine if there are any entries for the missing disk units or the IOA/IOP controlling them. (see "Using the Service Action Log" on page 12).
This ends the procedure.
14. Press F11, then press the Enter key to display the details.
Do all of the disk units listed on the display have a reference code of 0000?
Yes No
↓ Use the disk unit reference code shown on the display and go to the SRC information for the specific disk unit in "Chapter 2. Unit Reference Codes" on page 17. 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 Yes
↓ Go to step 21 of this procedure.
16. Use the IOP reference code shown on the display and go to "Chapter 2. Unit Reference Codes" on page 17. Perform the action indicated for the reference code.
This ends the procedure.
17. Does the following message appear in the list?
 - Unknown load-source status**Yes No**
↓ Go to step 19 of this procedure.
18. Select option 5 then press F11, then press the Enter key to display the details.

Does the *Assign Missing Load Source Disk* display appear?

No **Yes**

↓ Press the Enter key to assign the missing load-source disk unit.

This ends the procedure.

19. Does the following message appear in the list?

- Load source failure

Yes **No**

↓ The IPL completed successfully.

This ends the procedure.

20. Select option 5, then press F11, then press the Enter key to display the details.

21. 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.

22. Is the failing disk unit a 9337?

No **Yes**

↓ Go to step 27 of this procedure.

23. Is there more than one failing disk device attached to the IOA or MSIOP?

Yes **No**

↓ Go to step 25 of this procedure.

24. Are all the disk devices that are attached to the IOA or MSIOP failing?

Note: If the disk units are using mirrored protection, you may need to use *Display Disk Status* to answer the question.

No **Yes**

↓ Go to step 26 of this procedure.

25. Go to the service information for the specific disk unit listed below and perform the action indicated. Then return here and answer the following question.

- 9337 Disk Unit: go to the "Starting Problem Analysis" section of the 9337 Service Information.
- 660x, 671x Disk Units: Use SRC 3002 in "(660x, 671x, 673x) Disk Unit Reference Codes" on page 141 and exchange the FRUs shown one at a time.

Did the disk unit service information correct the problem?

No **Yes**

↓ **This ends the procedure.**

26. Exchange the IOA or MSIOP (see "Chapter 4. Removal and Installation Procedures" on page 593).

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, see "Failing Items" on page 539 to help determine parts and locations.

This ends the procedure.

27. Use Hardware Service Manager to display logical resources connected to the MSIOP (see Hardware Service Manager in the *AS/400 Service Functions*).

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28. Are all the disk devices that are attached to the MSIOP failing?

Yes No

↓ Go to step 31 of this procedure.

29. Is there more than one controller attached to the MSIOP?

Yes No

↓ Go to step 25 of this procedure.

30. Go to step 26 of this procedure.

31. Are all disk units attached to one controller missing?

Yes No

↓ Go to step 25 of this procedure.

32. Use the device documentation to correct the problem. Exchange the disk unit controller.

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. Select DST using Function 21 (see "Control Panel Functions" in the *AS/400 Service Functions* information).
2. Select the *Work with disk units* option 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 (see "Dedicated Service Tools (DST)" in the *AS/400 Service Functions* information).
 - 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.

Select Manual mode and perform an IPL to DST (see "Dedicated Service Tools (DST)" in the *AS/400 Service Functions* information).

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 correct the problem (see "Chapter 2. Unit Reference Codes" on page 17).

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.

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.

Are the disk units part of a 9337 subsystem?

No **Yes**

↓ If the protection was stopped without using the *Stop device parity protection* option of DST, use the 9337 device documentation and follow the manual process to enable device parity protection.

Select DST using Function 21 (see “Control Panel Functions” in the *AS/400 Service Functions* information).

Correct the problem by doing the following:

1. Select the *Work with disk units* option.
2. Select the *Work with disk unit recovery* option.
3. Select the *Correct device parity protection* option.
4. 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 “Hardware SRC Formats” in the *AS/400 Service Functions*).
2. See the service information for the specific storage device. Use the disk unit reference code listed below for service information entry.
660x 102E, 671x 102E (see Chapter 2. Unit Reference Codes)
9337 7xx0, 8xx0, Dxx0, Exx0 (x can be a number from 0 through 8)

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 (see “Disk Service Support” in “Recovery Procedures” on page 837).

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.

Perform the following:

1. Select DST using Function 21 (see “Control Panel Functions” in the *AS/400 Service Functions* information).
2. On the Service Tools display, select the *Start a Service Tool* option (see the *AS/400 Service Functions*).
3. Select the *Product activity log* option on the Start a Service Tool display.
4. Select the *Analyze log* option on the Product Activity Log display.
5. 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.

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6. Use the defaults on the Select Analysis Report Options display by pressing the Enter key.
7. Search the entries on the Log Analysis Report display for system reference codes associated with the missing disk units.
8. Go to "Chapter 2. Unit Reference Codes" on page 17 and use the SRC information to correct the problem.

This ends the procedure.

000B: Some system IOPs require cache storage be reclaimed.

Select DST using Function 21 (see "Control Panel Functions" in the *AS/400 Service Functions* information).

Reclaim the cache adapter card storage (see "Reclaim IOP Cache Storage" on page 892).

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 "Hardware SRC Formats" in the *AS/400 Service Functions*).
2. See the service information for the specific storage device. Use the disk unit reference code listed below for service information entry.
660x 102E, 671x 102E (see Chapter 2. Unit Reference Codes)
9337 7xx0, 8xx0, Dxx0, Exx0 (x can be a number from 0 through 8)

This ends the procedure.

000D: The system disk capacity has been exceeded.

For more information about disk capacity, see *AS/400e Handbook*, GA19-5486-18 .

This ends the procedure.

0010: The disk configuration has changed.

The operating system must be installed again and all customer data must be restored.

Select Manual mode on the control panel (see *AS/400 Service Functions*). Perform an IPL to reinstall the operating system.

Note: 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.

Select Manual mode on the control panel (see *AS/400 Service Functions*). 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 “Chapter 4. Removal and Installation Procedures” on page 593). For the location of the card, see “Expansion Tower Locations and Addresses” on page 687.

This ends the procedure.

0015: The mirrored load-source disk unit is missing from the disk configuration.

Go to step 1 for cause code 0002.

0016: A mirrored protected disk unit is missing.

Wait 6 minutes. If the same reference code appears, go to step 1 for cause code 0002.

0017: One or more disk units have a lower level of mirrored protection than originally configured.

Select Manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

The detailed display 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.

This ends the procedure.

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 “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).
3. Select the *Work with disk units* option.
4. Select the *Work with disk unit configuration* option.
5. Select the *Remove unit from configuration* option.
6. Select the disk unit you recorded earlier in this procedure.
7. 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)

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8. When the remove function is complete, select the *Add unit to configuration* option.
9. Select the disk unit you recorded earlier in this procedure.
10. Confirm the add. The disk unit is formatted during functional operation.

This ends the procedure.

001A: The loadsource disk unit data is down-level.

The loadsource disk unit is mirror protected. The system is using the loadsource disk unit that does not have the current level of data.

1. Select Manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does the Disk Configuration Error Report display appear?

Yes No

↓ The system is now using the correct loadsource.

This ends the procedure.

2. Does a *Load source failure* message appear in the list?

Yes No

↓ The system is now using the correct loadsource.

This ends the procedure.

3. Select option 5, then press F11, then press the Enter key to display details.

The loadsource type, model, and serial number information that the system needs is displayed on the console.

Is the loadsource disk unit (displayed on the console) attached to an MSIOP that cannot be used for a loadsource?

Yes No

↓ The loadsource disk unit is missing. Go to step 1 for cause code 0002.

4. Is the system configured for remote loadsource protection?

No Yes

↓ Go to “Recover Remote Load Source” on page 864.

5. Move the loadsource disk unit to the loadsource MSIOP.

This ends the procedure.

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 (see “Initial Program Load (IPL) Information” in the *AS/400 Service Functions* information) to determine the cause of the problem.

This ends the procedure.

001D:

1. Is the Disk Configuration Warning Report displayed?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

2. Select option 5 on the *Bad Load Source Configuration* message line. 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.

Go to “Disk Service Support” on page 837.

This ends the procedure.

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.

If the load-source disk unit in position 1 contains the correct level of Licensed Internal Code, perform the following:

1. Select Manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).
2. Is the Disk Configuration Warning Report displayed?

Yes No

↓ The system is now using the correct load source.

This ends the procedure.

3. 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 the Enter key.

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 (see “Restoring Licensed Internal Code” in the *AS/400 Service Functions* information).

This ends the procedure.

0020: The system appears to be a one disk unit system.

Select Manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

This ends the procedure.

0021: The system password verification failed.

Select Manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information). You will be prompted for the correct system password.

LIC PIPs

Enter the correct system password. If the correct system password is not available:

- Select the *Bypass the system password* option from the prompt.
- Have the customer contact the marketing representative immediately to order a new system password from IBM.

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.

This ends the procedure.

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.

Perform the following:

1. Select DST using Function 21 (see “Control Panel Functions” in the *AS/400 Service Functions* information).
2. On the Service Tools display, select the *Start a Service Tool* option (see the *AS/400 Service Functions*).
3. Select the *Product activity log* option on the Start a Service Tool display.
4. Select the *Analyze log* option on the Product Activity Log display.
5. 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.

6. Use the defaults on the Select Analysis Report Options display by pressing the Enter key.
7. Search the entries on the Log Analysis Report display for system reference codes associated with the missing disk units.
8. Go to “Chapter 2. Unit Reference Codes” on page 17 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.

Select Manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

You will be prompted for the correct system type or system unique ID.

This ends the procedure.

0025: Hardware Resource Information Persistence disabled.

Select Manual mode and perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

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 (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).
2. On the Service Tools display, select the *Start a Service Tool* option (see the *AS/400 Service Functions*).
3. Select the *Product activity log* option on the Start a Service Tool display.
4. Select the *Analyze log* option on the Product Activity Log display.
5. 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.

6. Use the defaults on the Select Analysis Report Options display by pressing the Enter key.
7. Search the entries on the Log Analysis Report display for system reference codes (B6xx 53xx) that are associated with the error.
8. Go to “Chapter 2. Unit Reference Codes” on page 17 and use the SRC information to correct the problem.

This ends the procedure.

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. The 4 rightmost characters of function 13 contain information regarding the install error. For more information about the install error, see the “LIC Install Debug Information” chapter in the *AS/400 Licensed Internal Code Diagnostic Aids - Volume 1*. If the customer does not require the service displays to be in the national language, you may be able to continue by doing another system IPL.

This ends the procedure.

0099: A Licensed Internal Code program error occurred.

Ask your next level of support for assistance.

This ends the procedure.

LIC-PIP13 (503x)

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

LIC PIPs

Note: Do not power off the system when performing this procedure.

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 can be found and corrected.

If the disk unit that stopped communicating with the system has mirrored protection active, normal operation of the system stops for 1 to 2 minutes. Then the system suspends mirrored protection for the disk unit that stopped communicating and continues normal operation. See "Disk Service Support" on page 837 for more information on systems with mirrored protection.

Read the "Overview" on page 322 before continuing with this procedure.

1. Was a Problem Summary Form completed for this problem?

No **Yes**

↓ Use the Problem Summary Form information and go to step 3 of this procedure.

2. Fill out a Problem Summary Form using the information from word 1 through 9 on the control panel. It is important that all the words of the SRC be written on the Problem Summary Form.
3. Recovery from a device command time out may have caused the communications loss condition (indicated by an SRC on the control panel). This communications loss condition has the following symptoms:
 - The A6xx SRC does not increment within 2 minutes.
 - The system continues to run normally after it recovers from the communications loss condition and the SRC is cleared from the control panel.

Does the communication loss condition have these symptoms?

Yes **No**

↓ Go to step 6 of this procedure.

4. 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 **No**

↓ **This ends the procedure.**

5. Print all product activity logs. Print the LIC LOGs with a major code of 1000. Provide your next level of support with this information.

This ends the procedure.

6. Are characters 7-8 of the top 16 character line of function 12 (2 rightmost characters of word 2) on the Problem Summary Form equal to 13 or 17?

Yes **No**

↓ Go to step 11 of this procedure.

7. Use the word 1 through 20 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) contain 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 9337 Disk Units, characters 4-8 of the bottom 16 character line of function 13 contain the disk unit serial number.

8. Is the disk unit a 9337?

No **Yes**

↓ Go to step 24 of this procedure.

9. Is the disk unit reference code 0000?

Yes **No**

↓ Using the information from step 7, find the table for the indicated disk unit type in "Chapter 2. Unit Reference Codes" on page 17. Perform problem analysis for the disk unit reference code.

This ends the procedure.

10. Find the table for the IOP type (characters 9-12 of the bottom 16 character line of function 13 - the 4 leftmost characters of word 9) in "Chapter 2. Unit Reference Codes" on page 17. Perform problem analysis for the unit reference code found in characters 13-16 of the bottom 16 character line of function 13 (the 4 rightmost characters of word 9).

This ends the procedure.

11. Are the characters 7-8 of the top 16 character line of function 12 (2 rightmost characters of word 2) on the Problem Summary Form equal to 27?

Yes **No**

↓ Go to step 16 of this procedure.

12. Use the word 1 through word 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) contain the 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) may contain the disk unit serial number.

Note: For 9337 Disk Units, characters 4-8 of the bottom 16 character line of function 13 (the 5 rightmost characters of word 8) contain the disk unit serial number.

- Characters 9-16 of the bottom 16 character line of function 13 (word 9) contain the disk unit reference code.

13. Is the disk unit a 9337?

LIC PIPs

No **Yes**

↓ Go to step 24 of this procedure.

14. Is the disk unit reference code 0000?

Yes **No**

↓ Using the information from step 12, find the table for the indicated disk unit type in "Chapter 2. Unit Reference Codes" on page 17. Perform problem analysis for the disk unit reference code.

This ends the procedure.

15. Find the table for the indicated disk unit type in "Chapter 2. Unit Reference Codes" on page 17.

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 PIPs that are associated with URC 3002.

This ends the procedure.

16. Are the characters 7-8 of the top 16 character line of function 12 (2 rightmost characters of word 2) on the Problem Summary Form equal to 62?

Yes **No**

↓ Use the information in characters 9-16 of the bottom 16 character line of function 13 (word 9) and go to "Chapter 2. Unit Reference Codes" on page 17. Use the information in word 9 instead of the information in word 1 for the reference code.

This ends the procedure.

17. Are characters 9-16 of the top 16 character line of function 12 (word 3) equal to 00010004?

Yes **No**

↓ Go to step 21 of this procedure.

18. Are characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) equal to 0000?

No **Yes**

↓ Go to step 22 of this procedure.

19. Disk information available in this step is:

- 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) characters contain the IOP direct select address.
- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contain the disk unit type, level, and model number.

Are characters 1-4 of the bottom 16 character line of function 13 (4 leftmost characters of word 8) 9337?

No **Yes**

↓ Go to step 24 of this procedure.

20. Find the table for the disk unit type (characters 1-4 of the bottom 16 character line of function 13 - the 4 leftmost characters of word 8) in "Chapter 2. Unit Reference Codes" on page 17 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.

21. Is word 3 equal to 0002000D?

Yes No

- ↓ Use the information in characters 9-16 of the bottom 16 character line of function 13 (word 9) and go to "Chapter 2. Unit Reference Codes" on page 17. Use the information in word 9 instead of the information in word 1 for the reference code.

Note:

- 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) characters 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.

22. Disk information available in this step is:

- Characters 1-8 of the top 16 character line of function 13 (word 6) contain the disk unit address.
- Characters 9-16 of the top 16 character line of function 13 (word 7) characters contain the IOP direct select address.
- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contain the disk unit type, level and model number.

Are characters 1-4 of the bottom 16 character line of function 13 (4 leftmost characters of word 8) 9337?

No Yes

- ↓ Go to step 24 of this procedure.

23. Find the table for the disk unit type (characters 1-4 of the bottom 16 character line of function 13 - the 4 leftmost characters of word 8) in "Chapter 2. Unit Reference Codes" on page 17 and use 3002 as the unit reference code. Exchange the FRUs for URC 3002 one at a time.

This ends the procedure.

24. The disk unit that stopped communicating with the system is a 9337 Disk Unit.
25. Locate the IOP using the IOP address (see "Expansion Tower Locations and Addresses" on page 687).

Note: If the IOP is located in a 504x rack, see *FC 504x Problem Analysis and Repair and Parts*.

Using the IOP type (identified by the label on the IOP), and the device address, find the location of the device (see "Expansion Tower Locations and Addresses" on page 687).

Does the 9337 Disk Unit Data display contain the value 9337 xxxx?

LIC PIPs

Note: xxxx can be any hexadecimal value from 0000 to FFFF.

No **Yes**

↓ Use the service information for the specific disk unit to analyze the status of the failing unit.

This ends the procedure.

26. Set the power switch on the failing 9337 disk unit to the Off position, then to the On position.

After 4 minutes, does the 9337 Data display contain the value *xxx?

Yes **No**

↓ Go to step 29 of this procedure.

27. Does the system continue normal operation in 3 to 4 minutes?

No **Yes**

↓ Go to step 33 of this procedure.

28. Go to step 30 of this procedure.

29. When the 9337 Disk Unit Data display contains the value B000, the disk unit has reached a ready status, but the system has not taken the ready status messages.

Does the 9337 Disk Unit Data display contain the value B000 in less than 4 minutes?

Yes **No**

↓ Use the service information for the specific disk unit to analyze the status of the failing unit.

This ends the procedure.

30. Perform the following:

- a. Check the cable connections between all of the units on the storage device I/O processor card that is connected to the failing unit.

Correct any loose connections and ensure that the terminating plug is installed tightly.

- b. Check the address switches on the backs of all of the units connected to the magnetic storage I/O processor card that is connected to the failing disk unit.

Notes:

- 1) If the device does not have address switches, continue with the next step of this procedure if you are servicing one of these units.
- 2) Ensure that each address switch displays the correct number. See the system configuration list. The latest level printout should be stored in the back of the *Basic System Operation, Administration, and Problem Handling* binder.
- c. If two or more address switches display the same number, change the address number of one or more units so that each address switch displays the correct number (see the system configuration list).
- d. For each unit that had its address switch changed, set the unit Power switch off, then on again.

31. Does the system continue normal operation in 3 to 4 minutes?

No **Yes**

↓ Go to step 33 of this procedure.

32. Set the Power switch on the disk unit to the Off position, then to the On position.

Does the system continue normal operation in 3 to 4 minutes?

Yes No

↓ Go to step 34 of this procedure.

33. Intermittent equipment checks may have caused this problem.

Display the system product activity log and look for entries that contain unit reference codes or IOP reference codes that may need action.

You can read a unit reference code history from the disk controller service panel.

This ends the procedure.

34. Fill out a Problem Summary Form using the information from words 1-9 on the control panel.

Are the characters 5-8 of the top 16 character line of function 11 (4 rightmost characters of word 1) on the Problem Summary Form the same as on the Problem Summary Form filled out in step 2 of this procedure?

Yes No

↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see "Chapter 2. Unit Reference Codes" on page 17).

This ends the procedure.

35. Are words 3-9 on the Problem Summary Form the same as on the Problem Summary Form filled out in step 2 of this procedure?

Yes No

↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see "Chapter 2. Unit Reference Codes" on page 17).

This ends the procedure.

36. Are characters 13-16 of the bottom 16 character line of function 13 (4 rightmost characters of word 9) on the Problem Summary Form that you filled out in step 34 of this procedure equal to 0000?

Yes No

↓ Return to "Chapter 2. Unit Reference Codes" on page 17. Analyze the problem using the data in characters 9-16 of the bottom 16 character line of function 13 (word 9) on the Problem Summary Form in place of the data in word 1, which originally sent you to this procedure.

This ends the procedure.

37. Go to the analyzing problems procedures in the service information for the specific disk unit to analyze the status of the failing unit. Then return here and answer the following question.

Did the service information for the specific disk unit correct the problem?

No Yes

↓ **This ends the procedure.**

38. A manual reset of the IOP may clear the attention SRC. Perform the steps in the following table:

LIC PIPs

Primary Partition Steps	Secondary Partition Steps
<ul style="list-style-type: none"> 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. Select Function 25 and press Enter to disable the service functions on the control panel. f. 	<ul style="list-style-type: none"> a. From the SST/DST screen select <i>Work With Partitions</i>. b. Select <i>Work With Partition Status</i>. c. Select Function 23 <i>More Options</i>. d. Select option 59 for the logical partition that you are working in. e. Select the IOP for debug. f. Select <i>Reset I/O Processor</i>. g. Return to the <i>Partition Status</i> screen.

Does an SRC occur?

Yes No

↓ **This ends the procedure.**

39. Force a dump of main storage, then perform an IPL by doing the following:
- a. Select Manual mode on the control panel.
 - b. Select function 22 (Main Storage Dump) on the control panel.
 - c. Press the Enter key to force a dump of main storage to the load-source disk unit.
 - d. When SRC A100 300x occurs, the dump is complete.
 - e. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does a different SRC occur, or does a display appear on the console showing reference codes.

No Yes

↓ Use the new SRC or the URC displayed on the console and go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

40. Does the same SRC occur?

No Yes

↓ Use the SRC information from the original failure and return to “Chapter 2. Unit Reference Codes” on page 17. Analyze the problem using the data in characters 9-16 of the bottom 16 character line of function 13 (word 9) on the Problem Summary Form in place of the data in word 1.

This ends the procedure.

41. The problem is intermittent.
- 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 “Copying a Main Storage Dump” in the *AS/400 Service Functions* information).
 - c. Provide your next level of support with this information.

This ends the procedure.

LIC-PIP13 (5077)**Introduction:**

Note: Do not power off the system when performing this procedure.

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 can be found and corrected.

If the disk unit that stopped communicating with the system has mirrored protection active, normal operation of the system stops for 1 to 2 minutes. Then the system suspends mirrored protection for the disk unit that stopped communicating and continues normal operation. See "Disk Service Support" on page 837 for more information on systems with mirrored protection.

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the "Overview" on page 322 before continuing with this procedure.

1. Was a Problem Summary Form completed for this problem?

No Yes

↓ Use the Problem Summary Form information and go to step 3 of this procedure.

2. Fill out a Problem Summary Form using the information from words 1-9 on the control panel. It is important that all the words of the SRC be written on the Problem Summary Form.

3. Recovery from a device command time out may have caused the communications loss condition (indicated by an SRC on the control panel). This communications loss condition has the following symptoms:

- The A6xx SRC does not increment within 2 minutes.
- The system continues to run normally after it recovers from the communications loss condition and the SRC is cleared from the control panel.

Does the communication loss condition have these symptoms?

Yes No

↓ Go to step 6 of this procedure.

4. 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 No

↓ **This ends the procedure.**

5. Print all Product Activity Logs. Print the LIC LOGs with a major code of 1000. Provide your next level of support with this information.

This ends the procedure.

LIC PIPs

6. Are the characters 7-8 of the top 16 character line of function 12 (2 rightmost characters of word 2) on the Problem Summary Form equal to 13 or 17?

Yes No

↓ Go to step 11 of this procedure.

7. Use the word 1-9 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) contain the unit address.
 - Characters 1-8 of the top 16 character line of function 13 (word 6) 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 9337 Disk Units, characters 4-8 of the bottom 16 character line of function 13 (the 5 rightmost characters of word 8) contain the disk unit serial number.

8. Is the disk unit a 9337?

No Yes

↓ Go to step 24 of this procedure.

9. Is the disk unit reference code 0000?

Yes No

↓ Using the information from step 7, find the table for the indicated disk unit type in "Chapter 2. Unit Reference Codes" on page 17. Perform problem analysis for the disk unit reference code.

This ends the procedure.

10. Find the table for the IOP type (characters 9-12 of the bottom 16 character line of function 13 - the 4 leftmost characters of word 9) in "Chapter 2. Unit Reference Codes" on page 17. Perform problem analysis for the unit reference code found in characters 13-16 of the bottom 16 character line of function 13 (the 4 rightmost characters of word 9).

This ends the procedure.

11. Are the characters 7-8 of the top 16 character line of function 12 (2 rightmost characters of word 2) on the Problem Summary Form equal to 27?

Yes No

↓ Go to step 16 of this procedure.

12. Use the word 1 through word 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) contain the unit address.
 - Characters 9-16 of the bottom 16 character line of function 12 (word 5) contain the disk unit type, level and model number.

- Characters 1-8 of the bottom 16 character line of function 13 (word 8) may contain the disk unit serial number.

Note: For 9337 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.

13. Is the disk unit a 9337?

No **Yes**

↓ Go to step 24 of this procedure.

14. Is the disk unit reference code 0000?

Yes **No**

↓ Using the information from step 12, find the table for the indicated disk unit type in “Chapter 2. Unit Reference Codes” on page 17. Perform problem analysis for the disk unit reference code.

This ends the procedure.

15. Find the table for the indicated disk unit type in “Chapter 2. Unit Reference Codes” on page 17.

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 PIPs that are associated with URC 3002.

This ends the procedure.

16. Are the characters 7-8 of the top 16 character line of function 12 (2 rightmost characters of word 2) on the Problem Summary Form equal to 62?

Yes **No**

↓ Use the information in characters 9-16 of the bottom 16 character line of function 13 (word 9) and go to “Chapter 2. Unit Reference Codes” on page 17. Use the information in word 9 instead of the information in word 1 for the reference code.

This ends the procedure.

17. Are characters 9-16 of the top 16 character line of function 12 equal to 00010004?

Yes **No**

↓ Go to step 21 of this procedure.

18. Are the characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) equal to 0000?

No **Yes**

↓ Go to step 22 of this procedure.

19. Disk information available in this step is:

- Characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) contain the disk unit reference code.

LIC PIPs

- Characters 1-8 of the top 16 character line of function 13 (word 6) contain 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) contain the disk unit type, level and model number.

Are characters 1-4 of the bottom 16 character line of function 13 (4 leftmost characters of word 8) 9337?

No **Yes**

↓ Go to step 24 of this procedure.

20. Find the table for the disk unit type (characters 1-4 of the bottom 16 character line of function 13 - the 4 leftmost characters of word 8) in "Chapter 2. Unit Reference Codes" on page 17 and use the 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.

21. Are characters 9-16 of the top 16 character line of function 12 equal to 0002000D?

Yes **No**

↓ Use the information in characters 9-16 of the bottom 16 character line of function 13 (word 9) and go to "Chapter 2. Unit Reference Codes" on page 17. Use the information in word 9 instead of the information in word 1 for the reference code.

Note:

- 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.

22. Disk information available in this step is:

- Characters 1-8 of the top 16 character line of function 13 (word 6) contain 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) contain the disk unit type, level and model number.

Are characters 1-4 of the bottom 16 character line of function 13 (4 leftmost characters of word 8) 9337?

No **Yes**

↓ Go to step 24 of this procedure.

23. Find the table for the disk unit type (characters 1-4 of the bottom 16 character line of function 13 - the 4 leftmost characters of word 8) in "Chapter 2. Unit Reference Codes" on page 17 and use 3002 as the unit reference code. Exchange the FRUs for URC 3002 one at a time.

This ends the procedure.

24. The disk unit that stopped communicating with the system is a 9337 Disk Unit.
25. Locate the IOP using the IOP address (see "Expansion Tower Locations and Addresses" on page 687).

Note: If the IOP is located in a 504x rack, see *FC 504x Problem Analysis and Repair and Parts*.

Using the IOP type (identified by the label on the IOP), and the device address, find the location of the device (see "Expansion Tower Locations and Addresses" on page 687).

Does the 9337 Disk Unit Data display contain the value 9337 xxxx?

Note: xxxx can be any hexadecimal value from 0000 to FFFF.

No Yes

↓ Use the service information for the specific disk unit to analyze the status of the failing unit.

This ends the procedure.

26. Set the power switch on the failing 9337 disk unit to the Off position, then to the On position.

After 4 minutes, does the 9337 Data display contain the value *xxx?

Yes No

↓ Go to step 29 of this procedure.

27. Does the system continue normal operation in 3 to 4 minutes?

No Yes

↓ Go to step 33 of this procedure.

28. Go to step 30 of this procedure.

29. When the 9337 Disk Unit Data display contains the value B000, the disk unit has reached a ready status, but the system has not taken the ready status messages.

Does the 9337 Disk Unit Data display contain the value B000 in less than 4 minutes?

Yes No

↓ Use the service information for the specific disk unit to analyze the status of the failing unit.

This ends the procedure.

30. Perform the following:
 - a. Check the cable connections between all of the units on the storage device I/O processor card that is connected to the failing unit.
Correct any loose connections and ensure that the terminating plug is installed tightly.
 - b. Check the address switches on the backs of all of the units connected to the magnetic storage I/O processor card that is connected to the failing disk unit.

Notes:

- 1) If the device does not have address switches, continue with the next step of this procedure if you are servicing one of these units.

LIC PIPs

- 2) Ensure that each address switch displays the correct number. See the system configuration list. The latest level printout should be stored in the back of the *Basic System Operation, Administration, and Problem Handling* binder.
 - c. If two or more address switches display the same number, change the address number of one or more units so that each address switch displays the correct number (see the system configuration list).
 - d. For each unit that had its address switch changed, set the unit Power switch off, then on again.
31. Does the system continue normal operation in 3 to 4 minutes?
- No Yes**
- ↓ Go to step 33 of this procedure.
32. Set the Power switch on the disk unit to the Off position, then to the On position.
- Does the system continue normal operation in 3 to 4 minutes?
- Yes No**
- ↓ Go to step 34 of this procedure.
33. Intermittent equipment checks may have caused this problem.
- Display the system Product Activity Log and look for entries that contain unit reference codes or IOP reference codes that may need action.
- You can read a unit reference code history from the disk controller service panel.
- This ends the procedure.**
34. Fill out a Problem Summary Form using the information from words 1-9 on the control panel.
- Are the characters 5-8 of the top 16 character line of function 11 (4 rightmost characters of word 1 on the Problem Summary Form the same as on the Problem Summary Form filled out in step 2 of this procedure?
- Yes No**
- ↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see "Chapter 2. Unit Reference Codes" on page 17).
- This ends the procedure.**
35. Are words 3-9 on the Problem Summary Form the same as on the Problem Summary Form filled out in step 2 of this procedure?
- Yes No**
- ↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see "Chapter 2. Unit Reference Codes" on page 17).
- This ends the procedure.**
36. Are the 4 rightmost characters in word 9 on the Problem Summary Form you filled out in step 34 of this procedure equal to 0000?
- Yes No**
- ↓ Return to "Chapter 2. Unit Reference Codes" on page 17. Analyze the problem using the data in characters 9-16 of the bottom 16 character line of function 13 (word 9) on the Problem Summary Form in place of the data in word 1, which originally sent you to this procedure.

This ends the procedure.

37. Go to the analyzing problems procedures in the service information for the specific disk unit to analyze the status of the failing unit. Then return here and answer the following question.

Did the service information for the specific disk unit correct the problem?

No Yes

↓ **This ends the procedure.**

38. A manual reset of the IOP may clear the attention SRC. Perform the steps in the following table:

Primary Partition Steps	Secondary Partition Steps
a. Select Manual mode on the control panel.	a. From the DST screen select <i>Work With Partitions</i> .
b. Select Function 25 and press Enter.	b. Select <i>Work With Partition Status</i> .
c. Select Function 26 and press Enter.	c. Select Function 23 <i>More Options</i> .
d. Select Function 67 and press Enter to reset the IOP.	d. Select option 59 for the logical partition that you are working in.
e. Select Function 25 and press Enter to disable the service functions on the control panel.	e. Select the IOP for debug.
f.	f. Select <i>Reset I/O Processor</i> .
	g. Return to the <i>Partition Status</i> screen.

Does an SRC occur?

Yes No

↓ **This ends the procedure.**

39. Force a dump of main storage, then perform an IPL by doing the following:
- Select Manual mode on the control panel.
 - Select function 22 (Main Storage Dump) on the control panel.
 - Press the Enter key to force a dump of main storage to the load-source disk unit.
 - When SRC A100 300x occurs, the dump is complete.
 - Perform an IPL to DST (see "Dedicated Service Tools (DST)" in the *AS/400 Service Functions* information).

Does a different SRC occur, or does a display appear on the console showing reference codes.

No Yes

↓ Use the new SRC or the URC displayed on the console and go to "Chapter 2. Unit Reference Codes" on page 17 to correct the problem.

This ends the procedure.

40. Does the same SRC occur?

No Yes

↓ Use the SRC information from the original failure and return to "Chapter 2. Unit Reference Codes" on page 17. Analyze the problem using the data in word 9 on the Problem Summary Form in place of the data in word 1.

This ends the procedure.

LIC PIPs

41. The problem is intermittent.
 - a. Print the system Product Activity Log for the magnetic storage subsystem and print the LICLOGs with a major code of 1000.
 - b. Copy the main storage dump to removable media (see "Copying a Main Storage Dump" in the *AS/400 Service Functions* information).
 - c. Provide your next level of support with this information.

This ends the procedure.

Logical Partition (LPAR) Problem Isolation Procedures

LPAR-PIP01

This procedure identifies some Logical Partition (LPAR) configuration conditions and their associated corrective actions.

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 No

↓ Go to step 8 on page 365 of this procedure.

2. Is the reporting partition the Primary partition?

Yes No

↓ Go to step 6 of this procedure.

3. Was the load source disk unit migrated from another partition within the same system?

Yes No

↓ The load source disk unit has not changed. Contact your next level of support.

This ends the procedure.

4. Is this load source device intended to be the load source for the Primary partition?

Yes No

↓ Power off the system. Return the original load source disk to the Primary partition and perform a system IPL.

This ends the procedure.

5. Use the "Accept load source disk unit" option to accept the new load source into the current partition.
 - a. Go to SST/DST in the current partition and select option "Work with system partitions".
 - b. From the "Work with system partitions" screen select option "Recover configuration data".
 - c. From the "Recover configuration data" screen select option "Accept load source disk unit".

This ends the procedure.

6. 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 No

↓ Contact your next level of support.

This ends the procedure.

7. Use the "Accept load source disk unit" option to accept the new load source into the current partition.
 - a. Go to SST/DST in the current partition and select option "Work with system partitions".
 - b. From the "Work with system partitions" screen select option "Recover configuration data".
 - c. From the "Recover configuration data" screen select option "Accept load source disk unit".

This ends the procedure.

8. Are there **multiple** B600 5311 SRCs logged in the same partition?

Yes No

↓ None of the conditions in this procedure have been met, call your next level of support.

This ends the procedure.

9. 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 *AS/400 Service Functions* information.

Yes No

↓ Go to step 16 on page 366 of this procedure.

10. Is the partition that is reporting the error the **Primary** partition?

Yes No

↓ Go to step 14 on page 366 of this procedure.

11. Was the load source disk unit migrated from another partition within the same system?

Yes No

↓ The load source disk unit has not changed. Contact your next level of support.

This ends the procedure.

12. Is this load source device intended to be the load source for the Primary partition?

Yes No

↓ Power off the system. Return the original load source disk to the Primary partition and perform a system IPL.

This ends the procedure.

LPAR PIPs

13. Use the *"Accept load source disk unit"* option to accept the new load source into the current partition.
 - a. Go to SST/DST in the current partition and select option *"Work with system partitions"*.
 - b. From the *"Work with system partitions"* screen select option *"Recover configuration data"*.
 - c. From the *"Recover configuration data"* screen select option *"Accept load source disk unit"*.

This ends the procedure.

14. 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 No

↓ Contact your next level of support.

This ends the procedure.

15. Use the *"Accept load source disk unit"* option to accept the new load source into the current partition.
 - a. Go to SST/DST in the current partition and select option *"Work with system partitions"*.
 - b. From the *"Work with system partitions"* screen select option *"Recover configuration data"*.
 - c. From the *"Recover configuration data"* screen select option *"Accept load source disk unit"*.

This ends the procedure.

16. 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 *AS/400 Service Functions* information.

Yes No

↓ None of the conditions in this procedure have been met, call your next level of support.

This ends the procedure.

17. Were any disk unit resources associated with the B600 5311 SRCs added to the partition, since the last IPL of this partition?

No Yes

↓ Use the *"Clear non-configured disk unit configuration data"* option to clear old configuration data from each new disk unit device.

- a. Go to SST/DST in the partition and select option *"Work with system partitions"*.
- b. From *"Work with system partitions"* screen select *"Recover configuration data"*.
- c. From the *"Recover configuration data"* screen select option *"Clear non-configured disk unit configuration data"*.
- d. Select each unit in the list which is new to the system. Press enter.
- e. Continue the system IPL.

This ends the procedure.

18. 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 Yes

↓ Go to step 21 of this procedure.

19. A scratch install was not performed.

Was the *"Clear configuration data"* option recently used to discontinue LPAR use?

Yes No

↓ The *"Clear configuration data"* option was not used. Contact your next level of support.

This ends the procedure.

20. Use the *"Clear non-configured disk unit configuration data"* option to clear old configuration data, from the old partition load source disk device(s).

- a. Go to SST/DST in the partition, select option *"Work with system partitions"*.
- b. From the *"Work with system partitions"* screen select option *"Recover configuration data"*.
- c. From the *"Recover configuration data"* screen select the option *"Clear non-configured disk unit configuration data"*.
- d. Select each former load source in the list. Press enter.
- e. Continue the system IPL.

This ends the procedure.

21. Was the load source device previously mirrored before the scratch install?

Yes No

↓ Go to step 23 of this procedure.

22. Use the *"Clear non-configured disk unit configuration data"* option. 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 that is reporting the SRC and select the *"Work with system partitions"* option .
- b. From the *"Work with system partitions"* screen select the *"Recover configuration data"* option.
- c. From the *"Recover configuration data"* screen select the *"Clear non-configured disk unit configuration data"* option.
- d. Select the former load source mirror in the list. Press enter.

23. Is the Primary partition reporting the B600 5311 error(s)?

LPAR PIPs

Yes No

↓ This ends the procedure.

24. Does the customer want multiple partitions on the system?

Yes No

↓ This ends the procedure.

25. Use the *"Recover primary partition configuration data"* option to retrieve the LPAR configuration data from other devices in the system.
- Go to SST/DST in the primary partition and select the *"Work with system partitions"* option .
 - From the *"Work with system partitions"* screen select option *"Recover configuration data"*.
 - From the *"Recover configuration data"* screen select the *"Recover primary partition configuration data"* option.
 - Verify the information that is presented on the screen. 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.

Note: The system will perform an automatic IPL during this step.

This ends the procedure.

Magnetic Storage I/O Processor (MSIOP) Problem Isolation Procedures

Overview

This section contains the procedures necessary to isolate a failure detected by the magnetic storage I/O processor (MSIOP).

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 or Expansion Tower" on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

Read and understand the following service procedures before using this section:

- “Powering On and Powering Off the System or Expansion Tower” on page 868
- “Expansion Tower Locations and Addresses” on page 687

MSIOP-PIP1

Introduction: This procedure runs the basic assurance tests (BATs) of the MSIOP card to see if the same reference code occurs. If a new reference code occurs, more analysis may be possible with the new reference code.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 368 before continuing with this procedure.

1. See “MSIOP Parts Location” on page 391 to find the MSIOP, signal cables, storage devices, and terminating plug.

Verify the following and correct if necessary before continuing with the next step of this procedure:

- All cable connections are made correctly and are tight.
- All storage devices have the correct switch address as indicated in the system configuration list.
- All storage devices are powered on and are in a ready status (see “Storage Device Ready Conditions for MSIOP Devices” on page 394).

2. Perform “MSIOP Test Procedure” on page 389. Then return here and answer the following question.

Does an SRC or reference code occur after running the MSIOP test?

Yes No

↓ Go to “MSIOP-PIP12” on page 380.

This ends the procedure.

3. Is the SRC or reference code that occurred during the MSIOP test the same SRC or reference code that sent you to this procedure?

Yes No

↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17).

This ends the procedure.

4. To isolate the failing storage device, signal cable, or terminating plug, go to “MSIOP-PIP2” on page 370, step 5.

This ends the procedure.

MSIOP-PIP2

Introduction: This procedure isolates problems on the MSIOP, storage device, signal cables, or the terminating plug. It also instructs you on how to find the MSIOP, the storage devices, signal cables, and the terminating plug. After verifying that the cables are correct, an isolation procedure is used to determine the failing part.

The isolation is performed by moving the terminating plug from the end of the storage device string toward the MSIOP, one unit at a time, until the failing unit is removed from the string. The MSIOP test is run each time the terminating plug is moved to the next unit to determine if the error occurs again.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 368 before continuing with this procedure.

1. See “MSIOP Parts Location” on page 391 to find the MSIOP, signal cables, storage devices, and terminating plug.

Verify the following and correct if necessary before continuing with the next step of this procedure:

- All cable connections are made correctly and are tight.
- All storage devices have the correct switch address as indicated in the system configuration list.
- All storage devices are powered on and are in a ready status (see “Storage Device Ready Conditions for MSIOP Devices” on page 394).

2. Perform “MSIOP Test Procedure” on page 389. Then return here and answer the following question.

Does the test run successfully (without an SRC or reference code)?

No Yes

↓ **This ends the procedure.**

3. Is the SRC or reference code that occurred during the MSIOP test the same SRC or reference code that sent you to this procedure?

Yes No

↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17).

This ends the procedure.

4. Is the terminating plug connected directly into the MSIOP card?

No Yes

↓ You have isolated the problem to either the MSIOP card (80% probability) or the terminating plug (20% probability).

This ends the procedure.

5. Disconnect the last storage device from the signal bus by doing the following:

- a. Disconnect both the terminating plug and the signal cable from the last storage device.
- b. Connect the signal cable and terminating plug together directly.

Note: If you disconnected a signal cable connection from this storage device in an earlier step, reconnect the cable now.

6. Perform “MSIOP Test Procedure” on page 389. Then return here and answer the following question.

Does the same SRC or reference code occur?

Yes No

- ↓ You have isolated the problem to the storage device you disconnected from the signal cable in step 5 of this procedure.

Perform the following:

- a. Reconnect the signal cable you disconnected in step 5 of this procedure.
 - b. Connect the terminating plug to the device it was connected to when you started this procedure.
 - c. Go to step 10 of this procedure.
7. Disconnect the last length of signal cable from the signal bus by doing the following:
 - a. Disconnect the terminating plug from the signal cable.
 - b. Reconnect the signal cable to the storage device you disconnected it from in step 5 of this procedure.
 - c. Follow the same signal cable to the next storage device (or to the MSIOP card).
 - d. Disconnect the signal cable at this connection and connect the terminating plug in its place.
 8. Perform “MSIOP Test Procedure” on page 389. Then return here and answer the following question.

Does the same SRC or reference code occur?

No Yes

- ↓ Go to step 4 of this procedure.

9. You have isolated the problem to the length of signal cable you disconnected from the signal bus in step 7 of this procedure.

Exchange the signal cable.

This ends the procedure.

10. Was the original URC 2000 or 2010?

No Yes

- ↓ Go to the service information for the specific storage device with URC FFD2.

This ends the procedure.

11. Go to the service information for the specific storage device with URC FFD5.

This ends the procedure.

MSIOP-PIP3

Introduction: This procedure isolates a fault that is causing communications problems between a storage device and the MSIOP that it is attached to.

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Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 368 before continuing with this procedure.

1. See “MSIOP Parts Location” on page 391 to find the MSIOP, signal cables, storage devices, and terminating plug.

Verify the following and correct if necessary before continuing with the next step of this procedure:

- All cable connections are made correctly and are tight.
- All storage devices have the correct switch address as indicated in the system configuration list.
- All storage devices are powered on and are in a ready status (see “Storage Device Ready Conditions for MSIOP Devices” on page 394).

2. Perform “MSIOP Test Procedure” on page 389. Then return here and answer the following question.

Is the SRC or reference code that occurred during the MSIOP test the same SRC or reference code that sent you to this procedure?

Yes **No**

- ↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17).

This ends the procedure.

3. The switch-addressed storage device is failing.
 - a. See “MSIOP Parts Location” on page 391 to find the MSIOP and the switch-addressed storage device.
 - b. Go to the service information for the specific storage device with URC FFD0.

Note: If the URC is 2030, the problem can be caused by a failure on the disk or tape where the MSIOP Licensed Internal Code is stored. If the failure was from disk, restore the Licensed Internal Code (see “Restoring Licensed Internal Code” in the *AS/400 Service Functions* information). If the failure was from tape, the tape must be exchanged with a new one.

This ends the procedure.

MSIOP-PIP4

Introduction: This procedure isolates a failing storage device attached to the MSIOP that is causing errors on the signal bus.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 368 before continuing with this procedure.

1. See “MSIOP Parts Location” on page 391 to find the MSIOP, signal cables, storage devices, and terminating plug.

Verify the following and correct if necessary before continuing with the next step of this procedure:

- All cable connections are made correctly and are tight.
- All storage devices have the correct switch address as indicated in the system configuration list.
- All storage devices are powered on and are in a ready status (see “Storage Device Ready Conditions for MSIOP Devices” on page 394).

2. Perform “MSIOP Test Procedure” on page 389. Then return here and answer the following question.

Does the test run successfully (without an SRC or reference code)?

No Yes

↓ **This ends the procedure.**

3. Power off one of the storage devices attached to the signal cable.

4. Perform “MSIOP Test Procedure” on page 389. Then return here and answer the following question.

Does an SRC or reference code occur after running the MSIOP test?

Yes No

↓ The storage device you just powered off is causing the failure.

Power on all of the storage devices attached to the signal cable. Then go to the correct storage device service information with URC FFD1.

This ends the procedure.

5. Is the SRC xxxx 1800?

No Yes

↓ The storage device you just powered off is causing the failure.

Power on all of the storage devices attached to the signal cable. Then go to the correct storage device service information with URC FFD1.

This ends the procedure.

6. Is the SRC or reference code that occurred during the MSIOP test the same SRC or reference code that sent you to this procedure?

Yes No

↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17).

Note: Leave powered off the units you have powered off in this procedure.

This ends the procedure.

7. Have you powered off all of the storage devices attached to the signal cable?

Yes No

↓ Go to step 3 of this procedure.

8. Perform the following:

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- a. Power on all of the storage devices attached to the signal cable.
- b. Find the storage device on the signal cable with the terminating plug and disconnect the terminating plug.
- c. Find the MSIOP card on the signal cable and disconnect the signal cable.
- d. Connect the terminating plug to the MSIOP card.
- e. Perform "MSIOP Test Procedure" on page 389.
- f. Return here and answer the following question.

Does the test run successfully (without an SRC or reference code)?

No **Yes**

↓ Perform the following:

- a. Disconnect the terminating plug from the MSIOP card.
- b. Reconnect the signal cable you disconnected in this step.
- c. Go to MSIOP-PIP2, step 5 on page 370 to continue analyzing the problem.

This ends the procedure.

9. The MSIOP card is the failing item.

Perform the following:

- a. Exchange the MSIOP card (see "Chapter 4. Removal and Installation Procedures" on page 593).
- b. Power on all of the storage devices attached to the MSIOP card. Go to "Verifying the Repair" on page 866.

This ends the procedure.

MSIOP-PIP5

Introduction: This procedure isolates a problem on the signal cable of an MSIOP.

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the "Overview" on page 368 before continuing with this procedure.

1. See "MSIOP Parts Location" on page 391 to find the MSIOP, signal cables, storage devices, and terminating plug.

Verify the following and correct if necessary before continuing with the next step of this procedure:

- All cable connections are made correctly and are tight.
- All storage devices have the correct switch address as indicated in the system configuration list.
- All storage devices are powered on and are in a ready status (see "Storage Device Ready Conditions for MSIOP Devices" on page 394).

2. Perform "MSIOP Test Procedure" on page 389. Then return here and answer the following question.

Does the test run successfully (without an SRC or reference code)?

No **Yes**

↓ **This ends the procedure.**

3. Disconnect the signal cable from the MSIOP card.
4. Perform "MSIOP Test Procedure" on page 389. Then return here and answer the following question.

Does the same SRC or reference code occur that occurred in step 2 of this procedure?

No **Yes**

↓ The MSIOP card is the failing item.

Perform the following:

- a. Exchange the MSIOP card (see "Chapter 4. Removal and Installation Procedures" on page 593).
- b. Reconnect the signal cable to the MSIOP card.
- c. Go to "Verifying the Repair" on page 866.

This ends the procedure.

5. Perform the following:
 - a. Reconnect the signal cable to the MSIOP card.
 - b. Go to "MSIOP-PIP2" on page 370, step 4 to continue analyzing the problem.

Note: If MSIOP-PIP2 isolates the problem to either the MSIOP card or the terminating plug, exchange the terminating plug.

This ends the procedure.

MSIOP-PIP6

Introduction: This procedure finds configuration errors of the MSIOP card and the storage devices attached to it. The locations of the MSIOP card and the storage devices are found on a Problem Summary Form or a product activity log record. Then the given list of possible problems is used to find and correct the problem.

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the "Overview" on page 368 before continuing with this procedure.

1. See "MSIOP Parts Location" on page 391 to find the MSIOP, signal cables, storage devices, and terminating plug.

Verify the following and correct if necessary before continuing with the next step of this procedure:

- All cable connections are made correctly and are tight.
- All storage devices have the correct switch address as indicated in the system configuration list.
- All storage devices are powered on and are in a ready status (see "Storage Device Ready Conditions for MSIOP Devices" on page 394).

Note: If a storage device is not powered on, go to Analyzing Power Problems in the Problem Analysis book that sent you to this book to correct the problem.

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2. Perform "MSIOP Test Procedure" on page 389. Then return here and answer the following question.

Is the SRC or reference code that occurred during the MSIOP test the same SRC or reference code that sent you to this procedure?

Yes **No**

- ↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see "Chapter 2. Unit Reference Codes" on page 17).

This ends the procedure.

3. Is the original reference code 3010?

Yes **No**

- ↓ Go to step 5 of this procedure.

4. The addressed storage device sent a response to the MSIOP that was either not expected or not valid. This usually means the device was not successful in getting its own Licensed Internal Code load.

Go to the service information for the specific storage device with URC FFD5 to continue analyzing the problem.

Note: This reference code could be the result of a configuration that is not valid. If the I/O processor number (the second digit of the unit address) is a 0 or a 1, ensure that the device is not a diskette or tape drive.

This ends the procedure.

5. This reference code indicates a configuration error. If there has been a recent change to the system configuration, review the installation procedures. Otherwise, use the table below to help isolate the problem.

Reference Code

Cause

6001 The addressed storage device has a block size that is not valid (block size must be 520 bytes).

See the following procedures:

- "9337 Procedure 4 - Problem Recovery" in the *FC 504x Problem Analysis and Repair and Parts* information

6005 More than 16 facilities have been detected by the MSIOP.

6006 The addressed storage device has a type number that is not valid, or the device needs an upgrade.

This ends the procedure.

MSIOP-PIP7

Introduction: This procedure determines why a storage device attached to an MSIOP stopped working.

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 368 before continuing with this procedure.

1. See “MSIOP Parts Location” on page 391 to find the MSIOP, signal cables, storage devices, and terminating plug.

Verify the following and correct if necessary before continuing with the next step of this procedure:

- All cable connections are made correctly and are tight.
- All storage devices have the correct switch address as indicated in the system configuration list.
- All storage devices are powered on and are in a ready status (see “Storage Device Ready Conditions for MSIOP Devices” on page 394).

2. Perform “MSIOP Test Procedure” on page 389. Then return here and answer the following question.

Is the SRC or reference code that occurred during the MSIOP test the same SRC or reference code that sent you to this procedure?

Yes **No**

- ↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17).

This ends the procedure.

3. Go to the service information for the specific storage device with URC FFD5.

This ends the procedure.

MSIOP-PIP8

Introduction: This procedure isolates a failure that occurred on the interface between the MSIOP and a storage device.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 368 before continuing with this procedure.

1. See “MSIOP Parts Location” on page 391 to find the MSIOP, signal cables, storage devices, and terminating plug.

Verify the following and correct if necessary before continuing with the next step of this procedure:

- All cable connections are made correctly and are tight.
- All storage devices have the correct switch address as indicated in the system configuration list.
- All storage devices are powered on and are in a ready status (see “Storage Device Ready Conditions for MSIOP Devices” on page 394).

2. Perform “MSIOP Test Procedure” on page 389. Then return here and answer the following question.

Is the SRC or reference code that occurred during the MSIOP test the same SRC or reference code that sent you to this procedure?

Yes **No**

MSIOP PIPs

- ↓ A new SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17).

This ends the procedure.

3. Go to the service information for the specific storage device with URC FFD3.
This ends the procedure.

MSIOP-PIP9

Introduction: This procedure gets the error data for an addressed storage device from an error detected by the MSIOP.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 368 before continuing with this procedure.

1. Go to “MSIOP Parts Location” on page 391 and determine the following information:
 - MSIOP location
 - Switch-addressed storage device location
 - Switch-addressed storage device type (on the device front panel)
 - Switch-addressed storage device model (on the device front panel)

Also, get the unit reference code (URC) from the Problem Summary Form.

Note: If the URC is not listed or is not valid for the device, use URC FFD5.

When you have the information, return here and continue with the next step of this procedure.

2. Using the unit type, unit model, and unit reference code information you found in step 1 of this procedure, go to the service information for the specific storage device to correct the problem.

This ends the procedure.

MSIOP-PIP10

Introduction: This procedure isolates a failure that occurred on the interface between the MSIOP and a storage device.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 368 before continuing with this procedure.

1. See “MSIOP Parts Location” on page 391 to find the MSIOP, signal cables, storage devices, and terminating plug.

Verify the following and correct if necessary before continuing with the next step of this procedure:

- All cable connections are made correctly and are tight.
 - All storage devices have the correct switch address as indicated in the system configuration list.
 - All storage devices are powered on and are in a ready status (see “Storage Device Ready Conditions for MSIOP Devices” on page 394).
2. Perform “MSIOP Test Procedure” on page 389. Then return here and answer the following question.

Is the SRC or reference code that occurred during the MSIOP test the same SRC or reference code that sent you to this procedure?

Yes No

- ↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17).

This ends the procedure.

3. Go to the *Analyzing Problems* manual for the storage device and perform the action indicated by URC FFF8.

This ends the procedure.

MSIOP-PIP11

Introduction: This procedure runs a MSIOP diagnostic test that checks for intermittent storage errors. The MSIOP has the ability to run an extended storage loop test and to correct problems when they are found.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 368 before continuing with this procedure.

1. Perform “MSIOP Test Procedure” on page 389. Then return here and answer the following question.

Does the test run successfully (without an SRC or reference code)?

Yes No

- ↓ There is a solid (not intermittent) failure in the MSIOP. Go to step 8 of this procedure.

2. Perform the following:

- a. From the AS/400 Main Menu, select the *Work with dedicated service tools (DST)* option.
- b. Log on the system.
- c. Select the *Work with disk units* option.
- d. Select the *Analyze disk device problem* option.

3. For this step, you need to know the address of the MSIOP to test. To get the address, see “MSIOP Parts Location” on page 391.

Select the MSIOP to be tested by doing the following:

- a. Select the *Select storage device to test* option and press the Enter key.

MSIOP PIPs

- b. Enter 1 on the line next to the MSIOP with the correct address.

Note: This selection process needs to be performed only once for this procedure, or you can wait until the next initial Licensed Internal Code load.

Did you get a message that said you attempted to select the load-source MSIOP?

No **Yes**

↓ This test cannot be run on the load-source MSIOP. Go to step 7 of this procedure.

4. Run the test on the MSIOP by doing the following:
 - a. Select the *Select and run tests* option and press the Enter key.
 - b. Select the *Controller storage test* option and press the Enter key.
 - c. Verify that the data displayed is correct and press the Enter key to start the test.

Note: Let this test run for 15 minutes or until a reference code occurs. Press the function key indicated on the display to end the test.

Does a reference code occur?

Yes **No**

↓ Go to step 7 of this procedure.

5. Is the reference code 1020 or 1030?

Yes **No**

↓ Go to step 8 of this procedure.

6. The problem was corrected. Return to normal operation.

This ends the procedure.

7. Check the reference codes in the product activity log (see the *AS/400 Service Functions* information) by doing the following:
 - a. Return to the Analyze Disk Device Problem display.
 - b. Write down the type, model, address, reference code, date, and time.

Has the original reference code at this MSIOP address occurred again in the last 24 hours?

Yes **No**

↓ The MSIOP recovered from the intermittent error.

This ends the procedure.

8. Exchange the MSIOP card (see “Chapter 4. Removal and Installation Procedures” on page 593).

Go to “Verifying the Repair” on page 866.

This ends the procedure.

MSIOP-PIP12

Introduction: This procedure isolates intermittent problems that are recorded in the product activity log. It looks for repeated errors occurring at one or more addresses of the MSIOP, storage device, or the storage I/O processor.

Note: For unit reference code (URC) 6007, a hardware or software failure can cause the errors. Software failures can occur in the storage device, the MSIOP, or in the Licensed Internal Code.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 368 before continuing with this procedure.

1. Look at the product activity log for repeated entries of SRC type 6112 with a common reference code (see “Product Activity Log” in the *AS/400 Service Functions* information).
2. Do you have repeated 6112 entries with common reference codes or common error descriptions?

Yes No

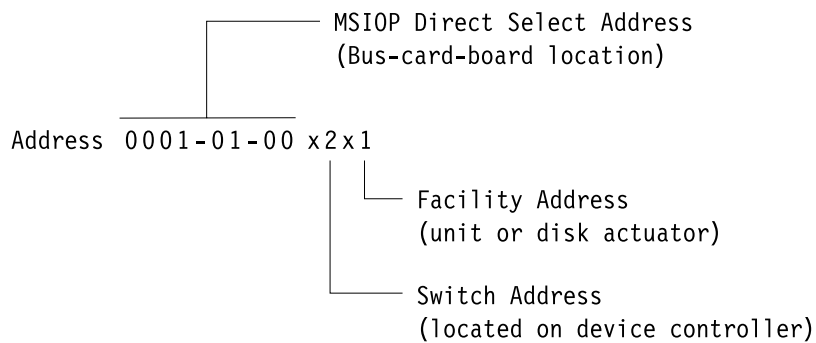
↓ Use the failing items associated with the original reference code and see “MSIOP (Type 611x) Failing Items” on page 392 to find the parts. Perform the necessary repair action and return to normal operation.

Note: For URC 6007, take no more action.

This ends the procedure.

3. Are all repeated errors occurring on the same MSIOP Direct Select Switch and Facility Address?

Example Address:



RZAG5501-1

No Yes

↓ You have isolated the problem to a single storage device. To determine the correct FRU to exchange, go to the service information for that device with URC:
 FFD3 for 9331
 FFD5 for 9347

Note: The error condition may be two storage devices responding to the same MSIOP at the same time. This condition could be caused by one of the following:

MSIOP PIPs

- A device address switch set to the wrong address
- A failing device address switch
- A failing, loose, or disconnected device address cable

This ends the procedure.

4. Are all repeated errors occurring on the same MSIOP Direct Select Addresses, and are the Switch Addresses different?

No **Yes**

- ↓ You have isolated the problem to either the MSIOP card or the attachment cables. Go to “MSIOP Parts Location” on page 391 to determine the correct FRU to exchange.

This ends the procedure.

5. Are all repeated errors occurring on the same MSIOP Direct Select Addresses and Switch Addresses, and are the Facility Addresses different?

No **Yes**

- ↓ You have isolated the problem to a device controller. Go to the service information for the specific storage device with URC FFF4 to determine the correct FRU to exchange.

This ends the procedure.

6. If the same error is occurring on different MSIOP Direct Select addresses and a common reference code is logged against different MSIOPs, this indicates a Licensed Internal Code problem or a power supply problem. Ask your next level of support for assistance.

This ends the procedure.

MSIOP-PIP13

Introduction: This procedure copies the dump to tape or diskette and asks you to send it to your next level of support.

When Licensed Internal Code errors that cannot be recovered occur, Licensed Internal Code attempts to dump the MSIOP to address 000087000000.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 368 before continuing with this procedure.

1. Access DST on the system console (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).
2. Copy the IOP dump from disk to tape or diskette. Use the instructions for the dump to tape or diskette function (see “Copying the IOP Storage Dump to Removable Media” in the *AS/400 Service Functions* information).

Note: Label the tape or diskette (for example, volid=SID87, file=DUMP).

3. Select all recent storage I/O processor product activity log entries and copy them to a diskette, tape, or printer. That is, spool the data and copy the spool file to a diskette, tape, or printer (see the *AS/400 Service Functions* information).

Note: Printer output is preferable for log data.

4. The loadable code group for the MSIOP is:
 - AJER101 for the type 6112 IOP

Ensure that the latest level of code for the MSIOP is loaded (see “Licensed Internal Code Information” in the *AS/400 Service Functions* information). Ask your next level of support for the code level.

5. For more error analysis, go to “MSIOP-PIP1” on page 369.

This ends the procedure.

MSIOP-PIP14

Introduction: This procedure isolates a failure in the MSIOP (type 650x) subsystem. This subsystem consists of:

- The MSIOP (type 650x)
- The 9337 Disk Units, the signal cables from the MSIOP to the 9337 Disk Units, and the terminating plugs on the 9337 Disk Units
- The SCSI tape units, the signal cables from the MSIOP to the tape units, and the terminating plugs on the tape units

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 368 before continuing with this procedure.

1. Use the list of “MSIOP (Type 650x) Failing Items” on page 393 to:
 - Get address information for the failing item.
 - Physically find the failing item.

Note: If the Problem Summary Form is not available, use the product activity log to gather the data. Select the entry for the reference code that sent you here and use the hexadecimal information to find the following:

- The direct select address (DSA)- BBBB-Cc-bb.
 - BBBB = hexadecimal offsets 4C and 4D.
 - Cc = hexadecimal offset 51.
 - bb = hexadecimal offset 4F.
- The unit address (UA)– hexadecimal offsets 18C through 18F.
- The device unit reference code (URC)– hexadecimal offsets 194 and 195.

See *AS/400 Service Functions* for more information on how to find address information in the product activity log.

2. Ensure that the cable connections between the MSIOP and the device are made correctly and are tight.
3. Ensure that both ends of the signal cable between the MSIOP and the device do not show any visible damage, such as bent or broken pins or a cracked connector.
4. Perform the following:
 - a. Go to “Storage Device Ready Conditions for MSIOP Devices” on page 394 and determine if there is a device ready problem.

MSIOP PIPs

- b. If necessary, correct the problem using the device service information.
- c. Return here and continue with the next step of this procedure.
5. Did you find and correct a device ready problem?
No Yes
↓ **This ends the procedure.**
6. Is the problem intermittent?
No Yes
↓ Go to “Correcting Intermittent Problems” on page 4.
This ends the procedure.
7. Exchange the FRUs in the failing item list for the reference code that sent you to this procedure (see “Chapter 4. Removal and Installation Procedures” on page 593).
8. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).
Does the IPL complete successfully?
No Yes
↓ **This ends the procedure.**
9. Go to “Starting Point For All Problems” on page 3 to correct the problem.
This ends the procedure.

MSIOP-PIP15

Introduction: This procedure isolates a failure in the SCSI bus.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

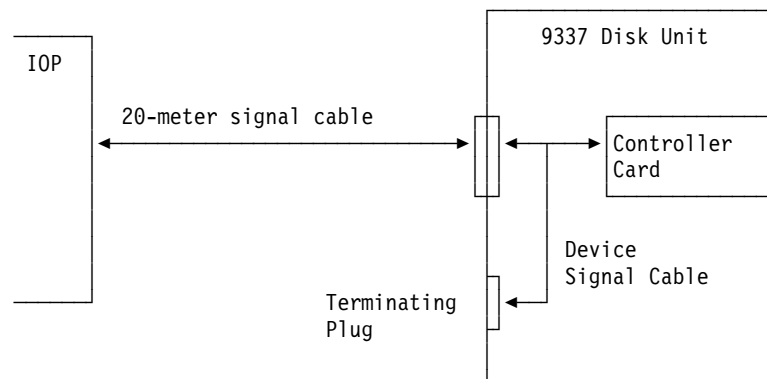
Read the “Overview” on page 368 before continuing with this procedure.

1. Were you performing an IPL from tape (type D) when the error occurred?
No Yes
↓ Go to “MSIOP-PIP17” on page 388 to continue problem isolation.
This ends the procedure.
2. Is the system available, and can you enter commands at the console?
No Yes
↓ Exchange the FRUs in the failing item list for the reference code that sent you to this procedure (see “Chapter 4. Removal and Installation Procedures” on page 593).
This ends the procedure.
3. Is the attached device a 9337 that is connected to the IOP with a **20-meter cable**?
Yes No
↓ Go to step 5 of this procedure.

4. Perform the following:
 - a. If the MSIOP is located in an I/O expansion tower, use bus level concurrent maintenance under *Hardware Service Manager* to power off the expansion tower. Otherwise, power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Disconnect the 9337 controller card (inside the 9337) from the signal cable.

Notes:

- 1) To disconnect the card, see the *9337 Disk Array Service Information*
- 2) It is easier to disconnect the card than to disconnect the cable.
- 3) See the following diagram to help understand this step.
- 4) If the signal cable is isolated as the failing item, this failing item now includes the signal cable inside the 9337.



- c. Go to step 6 of this procedure.
5. Perform the following:
 - a.

If the MSIOP is located in an I/O expansion tower, use bus level concurrent maintenance under *Hardware Service Manager* to power off the expansion tower. Otherwise, power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Disconnect the IOP signal cable from the attached device.
6. If you powered off an I/O expansion tower the power on the expansion tower. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does the Missing Disk Unit display appear on the console, and is the unit reference code 0000?

No Yes

- ↓ Exchange the FRUs in the failing item list for the reference code that sent you to this procedure (see “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

7. Does the same SRC or reference code that sent you to this procedure occur?

Yes No

- ↓ Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

8. The attached device and its terminating plug are not failing.

Perform the following:

MSIOP PIPs

- a. If the MSIOP is located in an I/O expansion tower, use bus level concurrent maintenance under *Hardware Service Manager* to power off the expansion tower. Otherwise, power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Disconnect the signal cable from the magnetic storage I/O processor (MSIOP) (type 650x).
- c.
- d. Power on the system or expansion tower that you powered off.

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

Yes **No**

↓ Exchange the signal cable.

This ends the procedure.

9. Exchange the MSIOP (type 650x) (see “Chapter 4. Removal and Installation Procedures” on page 593).

Go to “Verifying the Repair” on page 866.

This ends the procedure.

MSIOP-PIP16

Introduction: This procedure determines the device unit reference code (URC), then sends you to the reference code table in the device service information.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 368 before continuing with this procedure.

1. Were you performing an IPL from tape (type D) when the error occurred?

No **Yes**

↓ Go to the device service information to solve the problem.

2. Use the list of “MSIOP (Type 650x) Failing Items” on page 393 to:

- Get address information for the failing item.
- Physically find the failing item.

Note: If the Problem Summary Form is not available, use the product activity log to gather the data. Select the entry for the reference code that sent you here and use the hexadecimal information to find the following:

- The direct select address (DSA)- BBBB-Cc-bb.
 - BBBB = hexadecimal offsets 4C and 4D.
 - Cc = hexadecimal offset 51.
 - bb = hexadecimal offset 4F.
- The unit address (UA)– hexadecimal offsets 18C through 18F.
- The device unit reference code (URC)– hexadecimal offsets 194 and 195.

See *AS/400 Service Functions* for more information on how to find address information in the product activity log.

3. Ensure that the cable connections between the MSIOP and the device are made correctly and are tight.
4. Ensure that both ends of the signal cable between the MSIOP and the device do not show any visible damage, such as bent or broken pins or a cracked connector.
5. From step 2 of this procedure, find the type and model information and the URC for the attached storage device.

If you are using the Problem Summary Form to analyze this problem:

- Determine the storage device type and model from information on the device.
- The attached storage device URC is in word 7.

If the Problem Summary Form is not available, use the device unit reference code that you found in step 2.

Is the device URC 3020 or 3021?

Yes No

↓ Go to step 8 of this procedure.

6. A device URC of 3020 or 3021 means that a device attached to the addressed MSIOP is not given support or does not follow the system configuration rules (for example, too many devices are attached to the bus or a tape unit and a disk unit are attached to the same IOP).

Find the system configuration information from the last IPL and compare it to the present system configuration.

Note: To help in the comparison, look at the 4 leftmost characters of word 4 (the unit address of the device). Determine the physical address (see “Expansion Tower Locations and Addresses” on page 687). Find this location in the system and get the device type and model number.

Do the system configurations match?

No Yes

↓ A device on the SCSI bus may be failing. Go to the failing item list for the reference code that sent you to this procedure and exchange the FRUs listed (see “Chapter 4. Removal and Installation Procedures” on page 593). See “MSIOP Parts Location” on page 391 to find the failing item.

This ends the procedure.

7. Go to “Hardware Service Manager” in the *AS/400 Service Functions* information to correct the mismatch between the two configurations.

This ends the procedure.

8. Use the device type and model you found in step 5 of this procedure and go to the storage device service information to determine the reference code table ID. Did you find a storage device URC in step 5 of this procedure?

No Yes

↓ In the storage device service information, go to the reference code table and failing item list. Use the device URC from step 5 of this procedure to correct the problem.

This ends the procedure.

MSIOP PIPs

9. Go to the failing item list for the reference code that sent you to this procedure and exchange the FRUs listed (see "Chapter 4. Removal and Installation Procedures" on page 593).

This ends the procedure.

MSIOP-PIP17

Introduction: This procedure isolates a failure in the MSIOP (type 650x) subsystem during an IPL from tape (type D). This subsystem consists of:

- The MSIOP (type 650x)
- The tape units, the signal cables from the MSIOP to the tape units, and the terminating plugs on the tape units

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the "Overview" on page 368 before continuing with this procedure.

1. Use the list of "MSIOP (Type 650x) Failing Items" on page 393 to:
 - Get address information for the failing item.
 - Physically find the failing item.
2. Ensure that the cable connections between the MSIOP and the device are made correctly and are tight.
3. Ensure that both ends of the signal cable between the MSIOP and the device do not show any visible damage, such as bent or broken pins or a cracked connector.
4. Perform the following:
 - a. Go to "Storage Device Ready Conditions for MSIOP Devices" on page 394 and determine if there is a device ready problem.
 - b. If necessary, correct the problem using the device service information.
 - c. Return here and continue with the next step of this procedure.
5. Did you find and correct a device ready problem?

No Yes

↓ **This ends the procedure.**

6. Perform an IPL from tape by doing the following:
 - a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
 - b. Select IPL type D, In manual mode (see *AS/400 Service Functions*).
 - c. Power on the system.

Does the IPL complete successfully?

No Yes

↓ **This ends the procedure.**

7. Does the same SRC or reference code occur that sent you to this procedure?

Yes No

- ↓ Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

8. Exchange the FRUs in the failing item list for the reference code that sent you to this procedure (see “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

MSIOP Test Procedure

Introduction: This procedure runs the basic assurance tests (BATs) of the MSIOP card.

After running the test, make a note of the resulting reference code data (if any) on the Problem Summary Form or in a notebook. Then return to the problem isolation procedure step that sent you here.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

1. Does the IPL or Install the System display appear on the operator’s console, or is DST available on the console (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information)?

Yes No

- ↓ Go to step 6 of this procedure.

2. Access the Logical Hardware Resources on System Bus display:
 - a. From the IPL or Install the System display, select the *Use dedicated service tools (DST)* option.
 - b. Enter the password. You need the customer password to get to the Use Dedicated Service Tools (DST) display.
 - c. Select the *Start a Service Tool* option.
 - d. Select the *Hardware service manager* option.
 - e. Select the *Logical hardware resources (buses, IOPs, controllers,...)* option.
 - f. Select the *System bus resources* option.
3. On the Logical Hardware Resources on System Bus display, perform the following:
 - a. Change the *Subset by* field to *STG and press the Enter key.
 - b. Select the *I/O debug* option for the type 6112 IOP that has the same resource name, serial number and address as the IOP that reported the problem.

MSIOP PIPs

```

Logical Hardware Resources on System Bus

System bus(es) to work with . . . . . *ALL *ALL, 1- 7
Subset by . . . . . *STG *ALL, *STG, *WS, *CMN

Type options, press Enter.
2=Change detail 4=Remove 5=Display detail 6=I/O Debug
8=Associated packaging resource(s) 9=Resources associated with IOP

Resource
Opt Description Type-Model Status Name
- System Bus - Operational BUS01
- Multiple Function IOP * 9162-001 Operational CMB01
6 Storage IOP 6112-001 Operational SI03
- Storage IOP 6112-001 Operational SI04
- System Bus - Operational BUS02
- Storage IOP 6512-001 Operational SI01
- Storage IOP 6512-001 Operational SI02
More...

F3=Exit F5=Refresh F6=Print F9=Failed resources
F10=Non-reporting resources F11=Display serial/part numbers F12=Cancel

```

Figure 11. Example Logical Hardware Resources on System Bus Display

4. On the Select IOP Debug Function display, select the *IPL I/O processor* option and press the Enter key.

Note: Make a note of the time you select the *IPL I/O processor* option so that you can determine which product activity log entries occurred during the I/O processor IPL.

When the I/O processor completes the IPL, return to the Start a Service Tool display.

5. Look for product activity log entries that occurred during the I/O processor IPL by performing the following:
 - a. From the Start a Service Tool display, select the *Product activity log* option.
 - b. Select the *Analyze log* option.
 - c. Enter the date and time that corresponds with the I/O processor IPL.
 - d. If a new entry appears for the I/O processor IPL, write down the type, model, address, reference code, date, and time.
 - e. Return to the problem isolation procedure that sent you here.

This ends the procedure.

6. Perform an IPL by doing the following:
 - a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Power on the system in manual mode (see *AS/400 Service Functions*).

Does an SRC occur on the control panel?

No Yes

↓ Record the reference code data on the Problem Summary Form. Then return to the problem isolation procedure step that sent you here.

This ends the procedure.

7. Look at the console.

Does the Disk Configuration Error Report display or the Disk Configuration Warning Report display appear on the console?

No Yes

- ↓ Record the MSIOP reference code. Then return to the problem isolation procedure step that sent you here.

This ends the procedure.

8. Look for product activity log entries that occurred during the I/O processor IPL by performing the following:
 - a. Go to the Product Activity Log display in DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).
 - b. Select the *Analyze log* option.
 - c. Enter the date and time that corresponds with the I/O processor IPL.
 - d. If a new entry appears for the I/O processor IPL, write down the type, model, address, reference code, date, and time.
 - e. Return to the problem isolation procedure that sent you here.

This ends the procedure.

MSIOP Parts Location

Introduction: This procedure describes the following:

- Storage subsystem parts
- How to get address data from the product activity log or a Problem Summary Form
- How to use the system configuration list to physically find parts in the system

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

1. Are you working on a type 611x MSIOP?

Yes No

- ↓ Go to step 4 of this procedure.

2. Use the list of “MSIOP (Type 611x) Failing Items” on page 392 to:
 - Get address information for the failing item.
 - Physically find the failing item.

Note: If the Problem Summary Form is not available, use the product activity log to gather the data. In product activity log, go to the reference code that sent you here and use the hexadecimal information to find the following:

- The direct select address (DSA)- BBBB-Cc-bb.
 - BBBB = hexadecimal offsets 4C and 4D.
 - Cc = hexadecimal offset 51.
 - bb = hexadecimal offset 4F.
- The unit address (UA)– hexadecimal offsets 18C through 18F.
- The device unit reference code (URC)– hexadecimal offsets 194 and 195.

See *AS/400 Service Functions* for more information on how to find address information in the product activity log.

3. Return to the problem isolation procedure step that sent you here.

MSIOP PIPs

This ends the procedure.

4. You are working on a type 650x MSIOP.
Use the list of "MSIOP (Type 650x) Failing Items" on page 393 to:
 - Get address information for the failing item.
 - Physically find the failing item.

Note: If the Problem Summary Form is not available, use the product activity log to gather the data. Select the entry for the reference code that sent you here and use the hexadecimal information to find the following:

- The direct select address (DSA)- BBBB-Cc-bb.
 - BBBB = hexadecimal offsets 4C and 4D.
 - Cc = hexadecimal offset 51.
 - bb = hexadecimal offset 4F.
- The unit address (UA)– hexadecimal offsets 18C through 18F.
- The device unit reference code (URC)– hexadecimal offsets 194 and 195.

See *AS/400 Service Functions* for more information on how to find address information in the product activity log.

5. Return to the problem isolation procedure step that sent you here.
This ends the procedure.

MSIOP (Type 611x) Failing Items

Table 22. MSIOP (Type 611x) Failing Items

Item Description	Location Procedure
Magnetic storage I/O processor (MSIOP)	<ol style="list-style-type: none"> 1. Read the direct select address of the failing MSIOP from the product activity log record or from the Problem Summary Form. 2. If needed, use the system configuration list with this address to physically find the MSIOP.
Signal cables	<ol style="list-style-type: none"> 1. Read the direct select address of the failing MSIOP from the product activity log record or from the Problem Summary Form. 2. If needed, use the system configuration list with this address to physically find the MSIOP. 3. The signal cables connect the MSIOP to all the devices attached to it. You can find a list of signal cable part numbers in FI00500 in the "Failing Items" on page 539.
All attached storage devices	<ol style="list-style-type: none"> 1. Read the direct select address of the failing MSIOP from the product activity log record or from the Problem Summary Form. 2. If needed, use the system configuration list with this address to physically find the MSIOP. 3. Follow the cables from the MSIOP to find all attached storage devices. <p>Note: Any one of the storage devices attached to the MSIOP may be the failing item.</p>

Table 22. MSIOP (Type 611x) Failing Items (continued)

Item Description	Location Procedure
Switch-addressed storage devices	<ol style="list-style-type: none"> 1. Read the direct select address of the failing MSIOP from the product activity log record or from the Problem Summary Form. 2. Read the switch address of the failing storage device from the product activity log record or from the Problem Summary Form. 3. If needed, use the system configuration list with these addresses to physically find the MSIOP. 4. Follow the cables from the MSIOP to find the failing storage device with a switch address that compares to the product activity log or the Problem Summary Form. 5. More problem analysis may be possible by going to the service information for the specific storage device.
Terminating plug	<ol style="list-style-type: none"> 1. Read the direct select address of the failing MSIOP from the product activity log record or from the Problem Summary Form. 2. If needed, use the system configuration list with this address to physically find the MSIOP. 3. Follow the cables from the MSIOP to find all attached storage devices. 4. Find the last device attached to the signal cable. The terminating plug is installed on that device.

MSIOP (Type 650x) Failing Items

Table 23. MSIOP (Type 650x) Failing Items

Item Description	Location Procedure
Magnetic storage I/O processor (MSIOP)	<ol style="list-style-type: none"> 1. Read the direct select address of the failing MSIOP from the product activity log record or from the Problem Summary Form. 2. If needed, use the system configuration list with this address to physically find the MSIOP.
Signal cable	<ol style="list-style-type: none"> 1. Read the direct select address of the failing MSIOP from the product activity log record or from the Problem Summary Form. 2. If needed, use the system configuration list with this address to physically find the MSIOP. You can find the signal cable part numbers in FI00832 in the "Failing Items" on page 539. Note: For 3490 Tape Units, 35xx Tape Units, and 7208 Tape Drives, find the signal cable part numbers in FI00830.
Device	<ol style="list-style-type: none"> 1. Read the direct select address of the failing MSIOP from the product activity log record or from the Problem Summary Form. 2. If needed, use the system configuration list with this address to physically find the MSIOP. 3. Use the storage device service information to exchange the failing device.

MSIOP PIPs

Table 23. MSIOP (Type 650x) Failing Items (continued)

Item Description	Location Procedure
Device controller card	<ol style="list-style-type: none">1. Read the direct select address of the failing MSIOP from the product activity log record or from the Problem Summary Form.2. If needed, use the system configuration list with this address to physically find the MSIOP.3. Follow the cable from the MSIOP to find the attached storage device.4. The failing device controller card is installed in the device connected to the MSIOP by the cable you followed.5. Use the storage device service information to exchange the failing device controller card.
Device internal cable	<ol style="list-style-type: none">1. Read the direct select address of the failing MSIOP from the product activity log record or from the Problem Summary Form.2. If needed, use the system configuration list with this address to physically find the MSIOP.3. Follow the cable from the MSIOP to find the attached storage device.4. The failing device internal cable is installed in the device connected to the MSIOP by the cable you followed.5. Use the storage device service information to exchange the failing device internal cable.
Terminating plug	<ol style="list-style-type: none">1. Read the direct select address of the failing MSIOP from the product activity log record or from the Problem Summary Form.2. If needed, use the system configuration list with this address to physically find the MSIOP.3. Follow the cable from the MSIOP to find the attached storage device.4. The terminating plug is installed on the device connected to the MSIOP by the cable you followed.

Storage Device Ready Conditions for MSIOP Devices

Use Table 24 on page 395 to determine the ready conditions for storage devices. All the conditions listed for each device must be correct for the device to be ready.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Note: If the device is not ready, look at the Power Ready light on the frame control panel. If the device is not ready and it does not seem to be a primary power problem, use the unit reference code or other instructions in the *Action* column and go to the service information for the specific storage device.

Table 24. Storage Device Ready Conditions

Storage Device	Ready Description	Action
3490, 3570, 3590, 63A0	<ul style="list-style-type: none"> Power switch is set to the On position. Tape is loaded. Tape unit displays Ready. Tape unit SCSI address is set to 0 (zero). This setting is functionally the same as address 7. 	<p>See the tape unit operator information for instructions on how to make the tape unit ready.</p> <p>If you cannot make the tape unit ready, see the tape unit service information.</p>
7208	<ul style="list-style-type: none"> Power switch is on (pressed). Power light is on. Data cartridge is inserted. Ready light is on. System external signal cable is connected to the MSIOP and to the 7208 Tape Drive. <p>Note: 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>	<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 tape drive ready, go to "TU-PIP2" on page 500</p>
9331	<ul style="list-style-type: none"> Power switch is set to the On position. Power light is on. Unit Ready light is on. 	<p>See the <i>9331 Diskette Unit Service Information</i> for instructions on making the diskette unit ready.</p>
9337	<ul style="list-style-type: none"> Power switch is set to the On position. Unit Ready light is on. Unit Attention light is off. Device data display contains either *xxx, where x is any hexadecimal character, or B000. 	<p>Use the contents of the Data display and go to the "Analyzing Problems" section of the <i>9337 Disk Array Service Information</i></p>

Power Problem Isolation Procedures

Overview

This section contains the procedures necessary to isolate a failure in the system power.

Attention: Disconnecting or removing the type 2620 or type 2628 cryptographic I/O processor causes the loss of the master encryption key. Read "Important Cryptographic I/O Processor Information" on page 884 before disconnecting or removing the cryptographic I/O processor.

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 FRU is located, (see "Powering

Power PIPs

On and Powering Off the System or Expansion Tower” on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

DANGER

To prevent the system from powering on automatically during service procedures, select Manual or Secure mode on the system unit control panel. (RSFTD214)

POW-PIP1

This procedure isolates a power problem in the base expansion unit.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure only from the Primary partition’s console and the system control panel.

1. Is the SRC 2202, or 2302?

No **Yes**

↓ **Attention:** This part may be sensitive to electrostatic discharge (ESD). See “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899.

Go to “POW-PIP2” on page 402.

2. Perform the following:

- a. Power off the base expansion unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Disconnect the power cable.
- c. Remove the base expansion covers (see “Chapter 4. Removal and Installation Procedures” on page 593).
- d. Label and disconnect the following cables PWR1A, PWR1B, PWR1C, and PWR8 when present at the DASD and removable media devices or back

planes. (See “Expansion Tower Locations and Addresses” on page 687 for location and address information for these cables.)

- e. Install the base expansion covers (if they contain an interlock)
- f. Connect the power cable.
- g. Power on the base expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No Yes

↓ Go to step 12 of this procedure.

3. Perform the following:

- a. Power off the base expansion unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Remove the base expansion covers.
- c. Connect one of the cables that was disconnected in step 2 of this procedure to 1 backplane or device.
- d. Install the base expansion covers (if they contain an interlock)
- e. Power on the base expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No Yes

↓

Go to step 6 of this procedure.

4. Have all the cables that were disconnected in step 2 of this procedure been reconnected?

No Yes

↓ **This ends the procedure.**

5. Go to step 3 of this procedure.

6. Does the cable connect to 1 DASD or removable media device without a back plane?

No Yes

↓ Exchange the single DASD or removable media device last connected in step 3 of this procedure.

This ends the procedure.

7. Perform the following:

- a. Power off the base expansion unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Disconnect the power cable.
- c. Remove the base expansion covers.
- d. Disconnect all the DASD or removable media devices by backing them partially out of the enclosure.
- e. Install the base expansion covers (if they contain an interlock)
- f. Connect the power cable.
- g. Power on the base expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No Yes

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↓ Exchange the DASD or removable media back plane that was last connected to a cable in step 3 of this procedure.

8. Perform the following:
 - a. Power off the base expansion unit (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
 - b. Disconnect the power cable.
 - c. Remove the base expansion covers.
 - d. Connect 1 of the DASD or removable media devices that was disconnected in step 7 of this procedure.
 - e. Install the base expansion covers (if they contain an interlock)
 - f. Connect the power cable.
 - g. Power on the base expansion unit.

Does an over current SRC occur in 30 seconds?

No **Yes**

↓ Exchange the last DASD or removable media device that was connected in step 8 of this procedure.

This ends the procedure.

9. Have all the DASD or removable media devices been reconnected to the backplane you are working on?

Yes **No**

↓

Go to step 8 of this procedure.

10. Have all the back planes, DASD and removable media devices that were disconnected in step 2 of this procedure been reconnected?

No **Yes**

↓ **This ends the procedure.**

11. Go to step 3 of this procedure.

12. Perform the following:

- a. Power off the base expansion unit (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
- b. Disconnect the power cable.
- c. Remove the base expansion covers.
- d. Disconnect an air moving device from the base expansion unit power.
- e. Install the base expansion covers (if they contain an interlock)
- f. Connect the power cable.
- g. Power on the base expansion unit.

Does an overcurrent SRC occur in 30 seconds?

Yes **No**

↓ Exchange the last air moving device disconnected in this step.

13. Have all the air moving devices been disconnected in the base expansion unit power?

Yes **No**

↓ Go to step 12 of this procedure.

14. Reconnect all air moving devices and continue with step 15 of this procedure

15. **Attention:** This part may be sensitive to electrostatic discharge (ESD). See “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899.

Perform the following:

- a. Power off the base expansion unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Disconnect the power cord.
- c. Remove the base expansion covers.
- d. Remove all the cards from the base expansion unit card enclosures.
- e. Install the base expansion covers (if they contain an interlock)
- f. Connect the power cord.
- g. Power on the base expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No **Yes**

↓

Go to step 19 of this procedure.

16. Perform the following:
- a. Power off the base expansion unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Disconnect the power cord.
 - c. Remove the base expansion covers.
 - d. Install one of the cards you removed from the base expansion unit.
 - e. Install the base expansion covers (if they contain an interlock)
 - f. Connect the power cord.
 - g. Power on the base expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No **Yes**

↓

Exchange the last card you installed in this step.

This ends the procedure.

17. Have you installed all the cards in the base expansion unit card enclosures?

No **Yes**

↓ **This ends the procedure.**

18. Go to step 16 of this procedure.

19. **Attention:** The 3 connectors below should be removed from the expansion planar as a group of 3 in one step and installed as a group of 3 in one step to avoid high current damage to the pins and planar.

Perform the following:

- a. Power off the base expansion unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Disconnect the power cord.
- c. Remove the base expansion covers.
- d. Disconnect and label cables PWR3A or PWR3B when present and PWR2A or PWR2B when present.

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- e. Install the base expansion covers (if they contain an interlock)
- f. Connect the power cord.
- g. Power on the base expansion unit.

Does an overcurrent SRC occur in 30 seconds?

Yes **No**

↓ Go to step 25.

This ends the procedure.

20. Does the unit you are working on have a 480 watt power supply?

No **Yes**

↓ Go to step 29 of this procedure.

21. Perform the following:

- a. Power off the base expansion unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Remove the base expansion covers.
- c. Exchange the base expansion unit power supply 1 (P01).
- d. Install the base expansion covers (if they contain an interlock)
- e. Power on the base expansion unit.

Does an overcurrent SRC occur in 30 seconds?

Yes **No**

↓ The power supply exchanged in this step is the failing item.

This ends the procedure.

22. Is the expansion power supply unit 2 installed? (Backup power supply — not in all units.)

Yes **No**

↓ Go to step 25.

23. Perform the following:

- a. Power off the base expansion unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Remove the base expansion covers.
- c. Exchange the base expansion unit power supply 2 (P02).
- d. Install the base expansion covers (if they contain an interlock)
- e. Power on the base expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No **Yes**

↓ Go to step 27 on page 401 of this procedure.

24. The power supply you exchanged in the last step is the failing item.

This ends the procedure.

25. Perform the following:

- a. Power off the base expansion unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Remove the base expansion covers.
- c. Exchange the base expansion unit backplane.
- d. Install the base expansion covers (if they contain an interlock)

e. Power on the base expansion unit.

Does an overcurrent SRC occur in 30 seconds?

Yes No

↓ The backplane exchanged in this step is the failing item.

This ends the procedure.

26. Have all the backplanes in step 25 been exchanged?

Yes No

↓ Go to step 25.

27. Perform the following:

- a. Power off the base expansion unit (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Remove the base expansion covers.
- c. Exchange the electronics panel card. (SPNLCRD)
- d. Install the base expansion covers (if they contain an interlock)
- e. Power on the base expansion unit.

Does an overcurrent SRC occur in 30 seconds?

Yes No

↓ The electronics panel card exchanged in this step is the failing item.

This ends the procedure.

28. Exchange the power supply distribution backplane.

This ends the procedure.

29. Perform the following:

- a. Verify that the linecord is plugged into both the supply and the outlet and that there is power to the outlet.
- b. With AC applied, check the back of the supply. A single LED should be lit indicating that voltage is present.

Is the left LED lite on? (See Figure 12 on page 402).

Yes No

↓

Go to step 29c4.

c. Perform the following:

- 1) Disconnect all output cables plugged into the supply (not the AC linecord).
- 2) Using a non-conductive tool, locate the only *round* hole on the back of the supply.

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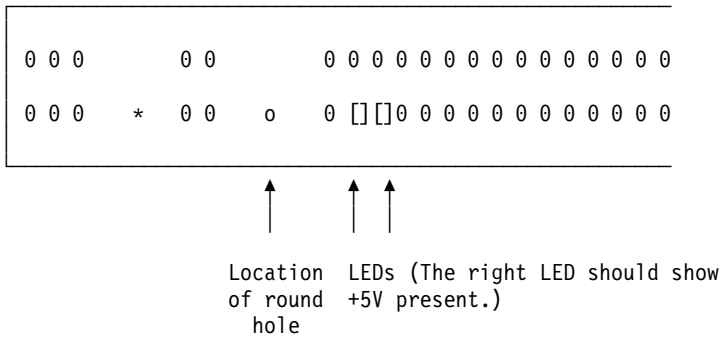


Figure 12. Round Hole Location On Back of Supply

- 3) Insert the tool into this round hole only to push the button within the supply (see Figure 12). Hold the button in. (The right LED indicates +5V present.)
While holding the button in, does the second LED light and remain lit?
No Yes
↓ Replace the control panel card (see “SPNLCRD” on page 581).
This ends the procedure.
- 4) The power supply does not power on and remain powered on. Replace the power supply, part number 21H9364.
This ends the procedure.

POW-PIP2

This procedure isolates a power problem in the internal expansion unit.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure only from the Primary partition’s console and the system control panel.

1. Is the SRC 2201, or 2301?
No Yes
↓ **Attention:** This part may be sensitive to electrostatic discharge (ESD). See “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899.
Go to “POW-PIP1” on page 396.
2. Are you working on an internal expansion unit with a SPD card enclosure?
Yes No
↓
Go to step 7.
3. Perform the following:
 - a. Power off the expansion (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Remove the internal expansion unit covers (see “Chapter 4. Removal and Installation Procedures” on page 593).

- c. Remove all the cards from the internal expansion unit card enclosures except the 2735 bus card (see "Chapter 4. Removal and Installation Procedures" on page 593).
- d. Install the internal expansion unit covers (if they contain an interlock).
- e. Power on the expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No Yes

↓ Go to step 7 of this procedure.

- 4. Perform the following:
 - a. Power off the expansion unit.
 - b. Remove the Internal expansion unit covers.
 - c. Install one of the cards you removed from the internal expansion unit.
 - d. Install the Internal expansion unit covers (if they contain an interlock).
 - e. Power on the expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No Yes

↓ Exchange the last card you installed in this step.

This ends the procedure.

- 5. Have you installed all the cards in the internal expansion unit card enclosures?

No Yes

↓ **This ends the procedure.**

- 6. Go to step 4 of this procedure.

- 7. Perform the following:
 - a. Power off the expansion unit.
 - b. Disconnect the power cord.
 - c. Remove the internal expansion unit covers.
 - d. Disconnect and label cables PWR21 and PWR22 when present at the disk unit and removable media devices.
 - e. Install the Internal expansion covers (if they contain an interlock).
 - f. Connect the power cord.
 - g. Power on the expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No Yes

↓ Go to step 16 of this procedure.

- 8. Perform the following:
 - a. Power off the expansion unit.
 - b. Remove the Internal expansion unit covers.
 - c. Connect one of the cables that was disconnected in step 7 of this procedure to 1 backplane or device.
 - d. Install the Internal expansion unit covers (if they contain an interlock).
 - e. Power on the expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No Yes

Power PIPs

↓ Go to step 11 of this procedure.

9. Have all of the cables that were disconnected in step 7 of this procedure been reconnected?

No Yes

↓ **This ends the procedure.**

10. Go to step 8 of this procedure.

11. Perform the following:

- a. Power off the expansion unit.
- b. Disconnect the power cord.
- c. Remove the internal expansion unit covers.
- d. Disconnect all disk units or removable media units by backing them out of the enclosure slightly.
- e. Install the internal expansion unit covers (if they contain an interlock).
- f. Connect the power cord.
- g. Power on the expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No Yes

↓ Exchange the disk unit or removable media backplane.

12. Perform the following:

- a. Power off the expansion unit.
- b. Disconnect the power cord.
- c. Remove the internal expansion unit covers.
- d. Connect one of the disk units or removable media units that was disconnected in step 11 of this procedure.
- e. Install the internal expansion unit covers (if they contain an interlock).
- f. Connect the power cord.
- g. Power on the expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No Yes

↓ Exchange the last disk unit or removable media unit that was connected in this step.

This ends the procedure.

13. Have all the disk units or removable media units been reconnected to the backplane you are working on?

Yes No

↓ Go to step 12 of this procedure.

14. Have all the backplanes and disk units and removable media units that were disconnected in step 7 of this procedure been reconnected?

No Yes

↓ **This ends the procedure.**

15. Go to step 8 of this procedure.

16. Perform the following:

- a. Power off the expansion unit.

- b. Disconnect the power cord.
- c. Remove the internal expansion unit covers.
- d. Disconnect an air moving device from the expansion unit power.
(Disregard air moving device errors when device is removed.)
- e. Install the internal expansion unit covers (if they contain an interlock).
- f. Connect the power cord.
- g. Power on the expansion unit.

Does an overcurrent SRC occur in 30 seconds?

Yes No

↓ Exchange the last air moving device disconnected in this step.

This ends the procedure.

17. Have all the air moving devices been disconnected in the internal expansion unit power?

Yes No

↓ Go to step 16 of this procedure.

18. Reconnect all air moving devices and go to step 19 of this procedure.

19. Are you working on an internal expansion unit with a PCI card planar?

Yes No

↓ Go to step 28 of this procedure.

20. Perform the following:

- a. Power off the expansion unit.
- b. Remove the internal expansion unit covers.
- c. Remove all the cards from the internal expansion unit PCI backplane.
- d. Install the internal expansion unit covers (if they contain an interlock).
- e. Power on the expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No Yes

↓ Go to step 24 of this procedure.

21. Perform the following:

- a. Power off the expansion unit.
- b. Remove the internal expansion unit covers.
- c. Install one of the cards you removed from the internal expansion unit PCI backplane.
- d. Install the internal expansion unit covers (if they contain an interlock).
- e. Power on the expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No Yes

↓ Exchange the last card you reinstalled in this step.

This ends the procedure.

22. Have you installed all the cards in the internal expansion unit PCI backplane?

No Yes

↓ **This ends the procedure.**

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23. Go to step 21.
24. Perform the following:
- Power off the expansion unit.
 - Remove the internal expansion unit covers.
 - Exchange the internal expansion unit power supply unit 3.
 - Install the internal expansion covers (if they contain an interlock).
 - Power on the expansion unit.
- Does an overcurrent SRC occur in 30 seconds?
- Yes No**
- ↓ The power supply exchanged in this step is the failing item.
- This ends the procedure.**
25. Is the internal expansion power supply unit 4 installed? This is the backup power supply and not used in all systems.
- Yes No**
- ↓ Go to step 27 of this procedure.
26. Perform the following:
- Power off the system.
 - Remove the internal expansion unit covers.
 - Exchange the internal expansion unit power supply 4.
 - Install the internal expansion unit covers (if they contain an interlock).
 - Power on the expansion unit.
- Does an overcurrent SRC occur in 30 seconds?
- Yes No**
- ↓ The power supply exchanged in this step is the failing item.
- This ends the procedure.**
27. Are you working on an internal expansion unit with an SPD card enclosure?
- Yes No**
- ↓ Go to step 30.
28. Perform the following:
- Power off the expansion unit.
 - Remove the internal expansion unit covers.
 - Exchange the 2735 expansion bus card.
 - Install the internal expansion covers (if they contain an interlock).
 - Power on the expansion unit.
- Does an overcurrent SRC occur in 30 seconds?
- Yes No**
- ↓ The 2735 expansion bus card exchanged in this step is the failing item.
- This ends the procedure.**
29. Perform the following:
- Power off the expansion unit.
 - Remove the Internal expansion unit covers.
 - Exchange the SPD enclosure backplane.

- d. Install the Internal expansion unit covers (if they contain an interlock).
- e. Power on the expansion unit.

Does an overcurrent SRC occur in 30 seconds?

No Yes

- ↓ The SPD enclosure backplane exchanged in this step is the failing item.

This ends the procedure.

- 30. Perform the following:
 - a. Power off the expansion unit.
 - b. Remove the internal expansion unit covers.
 - c. Exchange the internal expansion unit PCI backplane.
 - d. Install the internal expansion unit covers (if they contain an interlock).
 - e. Power on the expansion unit.

Does an overcurrent SRC occur in 30 seconds?

Yes No

- ↓ The expansion PCI backplane exchanged in this step is the failing item.

This ends the procedure.

- 31. Perform the following:
 - a. Power off the expansion unit.
 - b. Remove the base expansion unit covers.
 - c. Exchange the control panel card (SPNLCRD).
 - d. Install the base expansion unit covers (if they contain an interlock).
 - e. Power on the expansion unit.

Does an overcurrent SRC occur in 30 seconds?

Yes No

- ↓ The control panel card exchanged in this step is the failing item.

This ends the procedure.

- 32. Exchange the power supply interposer card and cable carrier assembly.

This ends the procedure.

POW-PIP3

This section contains the procedures necessary to isolate a failure in the system power.

Attention: Disconnecting or removing the cryptographic I/O processor causes the loss of the master encryption key. Read “Important Cryptographic I/O Processor Information” on page 884 before disconnecting or removing the cryptographic I/O processor.

The following safety notices apply throughout this section.

Read “Overview” on page 395 before servicing the system.

This procedure tests the battery power unit for correct operation.

Power PIPs

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure only from the Primary partition’s console and the system control panel.

1. Ensure that the battery power unit is installed and that there was no system power loss for the last 8 hours by checking the message log for CPF1816.

Note: If the message log shows that a power loss occurred in the last 8 hours, the battery may not be at full charge and the test may fail.

To check the message log, perform the following:

- a. Enter the command DSPLOG QHST
- b. Press F4 (prompt).

Note: The *time date* parameter that you use should be for the last 8-hour period.

- c. Fill in the time and date.

For the United States, the format is:

hhmmss mmddy

Note: The output may be printed (*PRINT) or displayed. The default (*) is to display.

2. Ensure that all user programs are ended.
3. Perform the following:
 - a. Ensure keystick is inserted and select Manual mode on the control panel.
 - b. Select function 21 (Make DST Available) on the control panel.
 - c. Press the Enter key.
 - d. Enter the password on the DST Sign On display. You need the customer password to get to the Use Dedicated Service Tools (DST) display.
4. Select the *Start a Service Tool* option.
5. Select the *System Power Control Network* option.
6. Press the Enter key to continue.
7. Select the *Test Battery Interface* option by entering 7 under the *OPT* column on the line for the correct unit (**not** the line for the frame).
8. Press the Enter key to confirm your selection.

Does the battery test complete with no problems found?

Yes No

↓ Exchange the following, one at a time (see “Chapter 4. Removal and Installation Procedures” on page 593):

- a. Battery power unit (see “Battery” on page 607).
- b. Battery charger unit or UPSUNIT as installed.
- c. The SPCN card (TWRCARD).
- d. Backplane.

This ends the procedure.

9. Approximately 24 hours from now, the system will perform a battery capacity test. When the battery capacity test completes successfully, the battery power unit test is complete.

This ends the procedure.

POW-PIP6

A power failure has been detected. Read the "Overview" on page 395 before continuing with this procedure.

Note:

Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

If the system has logical partitions, perform this procedure only from the Primary partition's console and the system control panel.

1. Perform the following:
 - a. Disconnect all 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 (see "Chapter 4. Removal and Installation Procedures" on page 593).
 - b. Remove and label all cards installed in the PCI card area.
 - c. Reconnect the ac power cable to the unit you are working on.
 - d. Power on the system.

Does a power reference code occur?

Yes No

↓ Go to step 12 on page 410 of this procedure.

2. Perform the following:
 - a. Power off the system.
 - b. Remove power supplies P02 and P03.
 - c. Power on the system.

Does a power reference code occur?

No Yes

↓ Go to step 5 of this procedure.

3. Perform the following:
 - a. Power off the system.
 - b. Reconnect power supply P02 removed in step 2 of this procedure.
 - c. Power on the system.

Does a power reference code occur?

No Yes

↓ Exchange the power supply P02 reconnected in this step.

This ends the procedure.

4. Exchange power supply P03.
This ends the procedure.
5. Perform the following:
 - a. Power off the system.
 - b. Remove power supply P01.
 - c. Reconnect power supply P02 or P03.
 - d. Power on the system.

Power PIPs

Does a power reference code occur?

Yes No

↓ Exchange the power supply P01.

This ends the procedure.

6. Perform the following:

- a. Remove one of the AMDs from the system that was not previously removed during this procedure. (Disregard a AMD SRC if it occurs during this step.)
- b. Power on the system.

Does a power reference code occur?

Yes No

↓ The AMD you removed in this step is the failing item.

This ends the procedure.

7. Have you removed all of the AMDs one at a time?

No Yes

↓ Install all the AMDs and continue with step 12 of this procedure.

8. Perform the following:

- a. Power off the system.
- b. Install the AMD that was removed in step 6 in the original location.
- c. Go to step 6 of this procedure.

9. Remove the power cable from 1 of the lower DASD backplanes (CCIN 5101) not previously removed and power on the system. Does a power reference code occur?

Yes No

↓ Replace the DASD backplane the power cable was removed from in this step.

10. Is a second lower DASD backplanes (CCIN 5101) installed?

No Yes

↓ Go to step 9 of this procedure.

11. Replace the following one at a time:

- DASD backplane – upper (CCIN 283C)
- Expansion backplane, (CCIN 282C) – part 87G0769
- Power distribution backplane

This ends the procedure.

12. Perform the following:

- a. Reinstall all of the cards you removed in step 1 on page 409 of this procedure.
- b. Reconnect the ac power cable to the unit you are working on.
- c. Power on the system.

Does a power reference code occur?

Yes No

↓ Go to step 15 on page 411 of this procedure.

13. Perform the following:

- a. Power off the system.
- b. Disconnect one of the cards you connected in step 12 on page 410 of this procedure.
- c. Power on the system.

Does a power reference code occur?

Yes **No**

↓ Exchange the last card you disconnected in this step (see "Chapter 4. Removal and Installation Procedures" on page 593).

14. Have you disconnected all the cards?

Yes **No**

↓ Repeat step 13 on page 410 of this procedure.

15. Perform the following:

- a. Power off the system.
- b. Reconnect all of the I/O devices (tape, diskette, or disk units) you disconnected in step 1 on page 409 of this procedure.
- c. Power on the system.

Does a power reference code occur?

Yes **No**

↓

This ends the procedure.

16. Perform the following:

- a. Power off the system.
- b. Disconnect all of the I/O devices (tape, diskette, or disk units) you connected in step 15 of this procedure.
- c. Reconnect one of the I/O devices (tape, diskette, or disk units) you disconnected in part b above.
- d. Power on the system.

Does a power reference code occur?

No **Yes**

↓ Exchange the last I/O device you reconnected in this step (see "Chapter 4. Removal and Installation Procedures" on page 593).

17. Have you reconnected all the I/O devices?

Yes **No**

↓ Repeat step 16 of this procedure, except part b.

18. **This ends the procedure.**

Operations Console Problem Isolation Procedures

Overview

This section contains the procedures necessary to isolate a failure with AS/400 Operations Console.

The following symptoms can be caused by AS/400 Operations Console failing to connect:

- One of the following SRCs

Operations Console PIPs

- A6xx 5001 or B6xx 5001
- A6xx 5004 or B6xx 5004
- A6xx 5007 or B6xx 5007
- The status in the AS/400 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.
- AS/400 Operations Console status is "Connecting remote control panel".

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 FRU is located, (see "Powering On and Powering Off the System or Expansion Tower" on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

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 or Expansion Tower" on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent the system from powering on automatically during service procedures, select Manual or Secure mode on the system unit control panel. (RSFTD214)

Operations Console-PIP1

This procedure will help isolate an Operations Console failure.

The following symptoms can be caused by AS/400 Operations Console failing to connect:

- One of the following SRCs
 - A6xx 5001 or B6xx 5001

- A6xx 5004 or B6xx 5004
- A6xx 5007 or B6xx 5007
- The status in the AS/400 Operations Console window remains "Connecting console".

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875 before continuing with this procedure. If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

1. Ensure that the 2745 IOA is installed into position C07.
2. Ensure the Operations Console cable, P/N 97H7557, is connected to the left connector on the adapter card in position C07. Push in the cable connector and tighten the thumbscrews.
3. Verify the other end of the Operations Console cable is connected to the system unit console (PC) serial port. Push in the cable connector and tighten the thumbscrews. Note: If the PC has a 9-pin connector, you need to use the 9 to 25 pin adapter, part number 46G0298, that was shipped with the system.
4. The following procedure will use the Windows application Hyperterminal to determine if there is connectivity between the system unit console (PC) and the AS/400:

a. Use one of the following paths to look for Hyperterminal:

- Start | Programs | Accessories | Hyperterminal
- Start | Programs | Communications | Hyperterminal

b. Is the Hyperterminal present?

Yes	No
-----	----

↓	Install the Hyperterminal (you will need the install media for the operating system used on the PC):
---	--

- 1) Place the install media, if CD, into the CD drive and wait for the program to begin. Then, close the window. If the program did not automatically start, or the install media is not a CD, continue with the next step.
- 2) Click Start.
- 3) Select Settings.
- 4) Click Control Panel.
- 5) Double-click Add/Remove Programs.
- 6) Click the Windows Setup tab or the Windows NT Setup tab, based on the operating system.
- 7) Select Communications.
- 8) Click Details.
- 9) Place a check mark in the box preceding Hyperterminal by clicking on the box.
- 10) Click OK.
- 11) Click Apply.
- 12) Follow the instructions in any prompts that may show up. If you are presented a window in which you might replace a newer file with an older one, click Yes to keep the newer file.
- 13) Follow one of the paths to Hyperterminal and start it.
 - Start | Programs | Accessories | Hyperterminal
 - Start | Programs | Communications | Hyperterminal

Operations Console PIPs

- c. Start the executable.
- d. Enter a name, then, click OK.
- e. Click on the drop down arrow at the end of the line for Connect using:
- f. Select the comm port being used for the console. It may be listed as COMn (where n is the communications port number) or direct to COMn. Then, click OK.
- g. In the Bits per second field, select 9600. Then, click OK.

Note: Failure to set the speed to 9600 will result in all garbage for text and you will not see the desired results of this test.

- h. The Hyperterminal window will open and should show Connected in the lower left corner of the window. You may also get garbage characters, +++ATH0, or nothing at all.
- i. Perform a Disconnect using the toolbar button. It's the one with the handset raised above the telephone.
- j. Click File | Properties.
- k. Click the Settings tab.
- l. Click the ASCII Setup button.
- m. Select the following options so they have a check mark in the preceding box:
 - Send line ends with line feeds
 - Echo typed characters locally
 - Append line feeds to incoming line ends
 - Wrap lines that exceed terminal width
- n. Click OK.
- o. Click OK.
- p. At the system's control panel, or use the remote control panel if installed with Operations Console, perform a function 25, then a function 26 to gain access to the extended (upper) functions.
- q. Perform a function 65. This may or may not result with information going to the Hyperterminal window or SRC D1008065 being displayed at the control panel.
- r. Perform a function 66. This may or may not result with information going to the Hyperterminal window or SRC D1008066 being displayed at the control panel.
- s. Using UPPERCASE, type NEGOTIATE in the Hyperterminal window. Then, press the Enter key.
- t. Wait at least 30 seconds. If no data is returned, do step 4s again.
- u. If there is full connectivity between the PC and the AS/400 a valid modem speed will be returned. If no data was returned, there is no connectivity and you should replace each of the following items, one at a time, and repeat this test:
 - Operations Console cable, P/N 97H7557
 - 2745 IOA

If replacing the IOA did not fix the problem there is probably something wrong with the PC or the Operations Console setup which will require support from someone with Operations Console software training to resolve.

Operations Console-PIP2

This problem isolation procedure will isolate a failure with the remote control panel.

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.

Note: This SRC can also show up temporarily for valid reasons. It is only a problem if the SRC remains constant.

- Remote control panel accepts mode selections, however the system does not respond.
- The remote control panel does not function.
- AS/400 Operations Console status is "Connecting remote control panel".

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875 before continuing with this procedure. If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Ensure the remote control panel cable is connected to the Debug port on the rear of the AS/400. The system end of the cable is the one with a missing pin in the cable's connector. The other end of the cable is connected to an EPP-capable parallel port on the PC. Push in the cable connector and tighten the thumbscrews at each end.

Note: EPP capability is usually a setting in the PC's BIOS (Basic Input/Output Service) and may require checking with the PC manufacturer to determine if this capability is possible and how to set it. Not all PCs have this ability.

The following procedure must be performed when Operations Console has an active connection.

1. Is the status in the AS/400 Operations Console window "Connecting console" or did you get a message indicating the connection to the LCS failed?

No **Yes**

- ↓ The remote control panel will not work until a connection to the LCS is established. Correct the problem and establish a connection. You may use "Operations Console-PIP1" on page 412 for assistance in determining if the PC and AS/400 have connectivity.

This ends the procedure.

2. Is the status in the AS/400 Operations Console window any of the following: "Connected", "Pending authorization", "Connecting remote control panel", or "Remote control panel connection to xxxxxx failed. Do you want to try again?"

No **Yes**

- ↓ Replace the remote control panel cable.

Inspect the internal cable to the Debug port for problems and replug the cable or replace if needed. **This ends the procedure.**

3. Did the remote control panel window open? Be certain to look behind any open windows or in the task bar for it.

Yes **No**

Operations Console PIPs

- ↓ Verify that AS/400 Operations Console is configured to use the remote control panel. If it is then you will require support from someone with Operations Console software training to resolve.

This ends the procedure.

4. Did the remote control panel window display any Function/Data, or either the Power or a Mode indicator green?

Yes No

- ↓ Replace the remote control panel cable.

This ends the procedure.

5. The console may not have control at this time and the remote control panel may be in read-only mode. Get control at the console and try an operation again. If the remote control panel is still unresponsive replace the remote control panel cable. You may require support from someone with Operations Console software training to resolve.

Storage Device I/O Processor (SDIOP) Problem Isolation Procedures

Overview

This section contains the procedures necessary to isolate a failure in the multiple function I/O card.

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 or Expansion Tower” on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

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

Read and understand the following service procedures before using this section:

- “Powering On and Powering Off the System or Expansion Tower” on page 868

- "Initial Program Load (IPL) Information" in the *AS/400 Service Functions* information.
- "Determining the Load Source Disk and Alternate IPL Device" in the system Problem Analysis Book.

SDIOP-PIP1

Introduction: This procedure performs 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.

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

1. Was the IPL performed from disk (Type A or Type B)?

No **Yes**

↓ Go to step 6 of this procedure.

2. 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. If the IPL media is cartridge type optical media (e.g. DVD), do not attempt to clean the media.

If the IPL media is non-cartridge type media (e.g. 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 the IPL media is tape, clean the recording head in the tape unit. Use the correct IBM Cleaning Cartridge Kit.

3. Perform a Type D IPL in Manual mode.

Does a system reference code (SRC) appear on the control panel?

Yes **No**

↓ Go to step 9 of this procedure.

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

Yes **No**

↓ A different SRC occurred. Use the new SRC to correct the problem (see "Starting Point For All Problems" on page 3).

This ends the procedure.

5. 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 "Chapter 2. Unit Reference Codes" on page 17). If the failing item list contains FI codes, see "Failing Items" on page 539 to help determine part numbers and location in the system.

This ends the procedure.

SDIOP PIPs

6. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does an SRC appear on the control panel?

No **Yes**

↓ Go to step 11 of this procedure.

7. Does the Disk Configuration Error Report display or the Disk Configuration Warning Report display appear on the console?

No **Yes**

↓ Select option 5, then press F11, then press the Enter key to display the details.

If all of the reference codes are 0000, go to “LIC-PIP11” on page 337 and use cause code 0002. If any of the reference codes are not 0000, go to step 11 of this procedure and use the reference code that is not 0000.

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

8. Look at the product activity log (see “Product Activity Log” in the *AS/400 Service Functions* information).

Is an SRC logged as a result of this IPL?

Yes **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 (see the failing item list for this reference code in “Chapter 2. Unit Reference Codes” on page 17 and “Chapter 4. Removal and Installation Procedures” on page 593). If the failing item list contains FI codes, see “Failing Items” on page 539 to help determine part numbers and location in the system.

This ends the procedure.

9. Does the Disk Configuration Error Report display or the Disk Configuration Warning Report display appear on the console?

No **Yes**

↓ Select option 5, then press F11, then press the Enter key to display the details.

If all of the reference codes are 0000, go to “LIC-PIP11” on page 337 and use cause code 0002. If any of the reference codes are not 0000, go to step 11 of this procedure 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. Look at the product activity log (see “Product Activity Log” in the *AS/400 Service Functions* information).

Is an SRC logged as a result of this IPL?

Yes **No**

↓ The problem is corrected.

This ends the procedure.

11. Record the SRC on the Problem Summary Form (see “Appendix A. Problem Summary Form” on page 895).

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

Yes **No**

- ↓ Use the new SRC or reference code to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17).

This ends the procedure.

12. Perform the following:

- a. Power off the system or expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Exchange the FRUs in the failing item list for the SRC you have now. Start with the highest probable cause of failure (see the failing item list for this reference code in “Chapter 2. Unit Reference Codes” on page 17 and “Chapter 4. Removal and Installation Procedures” on page 593). Perform steps 13 through 18 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.

13. Power on the system or the expansion tower.

Does an SRC appear on the control panel?

No **Yes**

- ↓ Go to step 16 of this procedure.

14. Does the Disk Configuration Error Report display or the Disk Configuration Warning Report display appear on the console?

No **Yes**

- ↓ Select option 5, then press F11, then press the Enter key to display the details.

If all of the reference codes are 0000, go to “LIC-PIP11” on page 337 and use cause code 0002. If any of the reference codes are not 0000, go to step 11 of this procedure 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. Look at the product activity log (see “Product Activity Log” in the *AS/400 Service Functions* information).

Is an SRC logged as a result of this IPL?

Yes **No**

- ↓ The last FRU you exchanged was failing.

Note: Before exchanging a disk unit, you should attempt to save customer data. Go to “Disk Unit” under “Chapter 4. Removal and Installation Procedures” on page 593 before exchanging a disk unit.

This ends the procedure.

SDIOP PIPs

16. Record the SRC on the Problem Summary Form (see “Appendix A. Problem Summary Form” on page 895).

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

No **Yes**

↓ The last FRU you exchanged is not the failing FRU. Go to step 12 of this procedure to continue FRU isolation.

17. 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 **No**

↓ Use the new SRC or reference code to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17).

This ends the procedure.

18. The last FRU you exchanged was failing.

Note: Before exchanging a disk unit, you should attempt to save customer data. Go to “Disk Unit” under “Chapter 4. Removal and Installation Procedures” on page 593 before exchanging a disk unit.

This ends the procedure.

SDIOP-PIP13

Introduction: This procedure isolates problems on the interface between the I/O card and the storage devices when the I/O card is the most probable failing item.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

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

URC	SCSI Bus
-----	----------

3100	0
------	---

3101	1
------	---

3102	2
------	---

1. Were you performing an IPL from removable media (IPL type D) when the error occurred?

No **Yes**

↓ Exchange the FRUs in the failing item list for the reference code that sent you to this procedure.

2. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does an SRC appear on the control panel?

No **Yes**

↓ Go to step 7 of this procedure.

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

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

Yes No

↓ Go to step 6 of this procedure.

4. On some of the displays that are listed in step 3 of this procedure, you must press F11 to display reference codes.

Are all of the reference codes 0000?

No Yes

↓ Go to “LIC-PIP11” on page 337 and use cause code 0002.

This ends the procedure.

5. Go to step 7 of this procedure and use the reference code that is not 0000.

6. Look at the product activity log (see “Product Activity Log” in the *AS/400 Service Functions* information).

Is an SRC logged as a result of this IPL?

Yes 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 “Chapter 2. Unit Reference Codes” on page 17). If the failing item list contains FI codes, see “Failing Items” on page 539 to help determine part numbers and location in the system.

This ends the procedure.

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

Yes No

↓ Record the SRC on the Problem Summary Form (see “Appendix A. Problem Summary Form” on page 895). Then go to “Chapter 2. Unit Reference Codes” on page 17 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 or Expansion Tower” on page 868).
- 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 (see “Chapter 4. Removal and Installation Procedures” on page 593). 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 Yes

↓ Go to step 16 of this procedure.

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

- Disk Configuration Error Report

SDIOP PIPs

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

Yes No

↓ Go to step 15 of this procedure.

10. Does the Display Unknown Mirrored Load-Source Status display appear on the console?

Yes No

↓ Go to step 13 of this procedure.

11. Is the reference code the same one that sent you to this procedure?

No Yes

↓ Go to step 17 of this procedure.

12. 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 or Expansion Tower" on page 868).
- b. Remove the I/O card you installed in step 8 of this procedure and install the original I/O card.

Note: Do not power on the system or the expansion tower now.

A device connected to the I/O card could be the failing item.

Go to SDIOP-PIP16, step 7 to continue isolating the problem.

This ends the procedure.

13. On some of the displays that are listed in step 9 of this procedure, you must press F11 to display reference codes.

Are all of the reference codes 0000?

No Yes

↓ Go to "LIC-PIP11" on page 337 and use cause code 0002.

This ends the procedure.

14. Go to step 16 of this procedure and use the reference code that is not 0000.

15. Look at the product activity log (see "Product Activity Log" in the *AS/400 Service Functions* information).

Is an SRC logged as a result of this IPL?

Yes No

↓ The I/O card, which you removed in step 8 of this procedure, is the failing item.

This ends the procedure.

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

Yes No

↓ Record the SRC on the Problem Summary Form (see "Appendix A.

Problem Summary Form” on page 895). Then go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

17. 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 or Expansion Tower” on page 868).
- b. Remove the I/O card you installed in step 8 of this procedure and install the original I/O card.

Note: Do not power on the system or the expansion tower now.

A device connected to the I/O card could be the failing item.

Go to SDIOP-PIP16, step 7 on page 424 to continue isolating the problem.

This ends the procedure.

SDIOP-PIP16

Introduction: This procedure isolates failing devices that are identified by FI codes FI01105, FI01106, and FI01107. In this procedure, you will remove devices that are identified by the FI code. 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.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem. See *AS/400 Service Functions* for more information on logical partitions.

1. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does an SRC appear on the control panel?

No Yes

↓ Go to step 6 of this procedure.

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

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

Note: On the Disk Configuration Error Report display, 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 No

↓ Go to step 5 of this procedure.

3. On some of the displays that are listed in step 2 of this procedure, you must press F11 to display reference codes.

Are all of the reference codes 0000?

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No Yes

↓ Go to "LIC-PIP11" on page 337 and use cause code 0002.

This ends the procedure.

4. Go to step 6 of this procedure and use the reference code that is not 0000.
5. Look at the Product Activity Log (see "Product Activity Log" in the *AS/400 Service Functions* information).

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

Yes 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 (see the failing item list for this reference code in "Chapter 2. Unit Reference Codes" on page 17). If the failing item list contains FI codes, see "Failing Items" on page 539 to help determine part numbers and location in the system.

This ends the procedure.

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

Yes No

↓ Record the SRC or reference code on the Problem Summary Form. Then go to "Chapter 2. Unit Reference Codes" on page 17 to correct the problem.

This ends the procedure.

7. Isolate the failing device by doing the following:
 - a. Power off the system or the expansion tower if it is powered on (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
 - b. Go to "Failing Items" on page 539 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 9 of this procedure.
8. Continue to isolate the possible failing items by doing the following:
 - a. Power off the system or the expansion tower (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
 - b. Disconnect the next device that is identified by FI codes FI01105, FI01106, or FI01107 in the FRU list. (See the note in step 7 of this procedure). 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.
9. Power on the system or the expansion tower.
Does an SRC appear on the control panel?

No Yes

↓ Go to step 14 of this procedure.

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

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

Note: On the Disk Configuration Error Report display, 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 **Yes**

↓ Go to step 14 of this procedure.

11. Look at the Product Activity Log (see “Product Activity Log” in the *AS/400 Service Functions* information).

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

No **Yes**

↓ Go to step 14 of this procedure.

12. 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 **Yes**

↓ Exchange the failing FRU.

Note: Before exchanging a disk drive, you should attempt to save customer data. Go to “Start Disk Service Here” on page 837 before exchanging a disk unit.

This ends the procedure.

13. Exchange the failing item and reconnect the devices you disconnected previously (see “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

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

Yes **No**

↓ Record the SRC or reference code on the Problem Summary Form. Then go to step 17 of this procedure.

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?

Yes **No**

↓ Leave the device disconnected and go to step 8 of this procedure to continue isolating the possible failing items.

16. 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 “Chapter 2. Unit Reference Codes” on page 17). If the failing item list contains FI codes, see “Failing Items” on page 539 to help determine part numbers and location in the system.

This ends the procedure.

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17. Is the SRC B1xx 4504, and have you disconnected the load-source disk unit?

Note: The load-source disk unit is disconnected by disconnecting disk unit 1.

No **Yes**

↓ Go to step 19 of this procedure.

18. Does one of the following displays appear on the console, and are all reference codes 0000?

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

Note: On the Disk Configuration Error Report display, 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 **No**

↓ A new SRC or reference code occurred. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

19. The last device you disconnected may be the failing item. Exchange the last device you disconnected (see “Chapter 4. Removal and Installation Procedures” on page 593).

Note: Before exchanging a disk drive, you should attempt to save customer data. Go to “Start Disk Service Here” on page 837 before exchanging a disk unit.

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

No **Yes**

↓ **This ends the procedure.**

20. Reconnect the devices you disconnected previously in this procedure.
21. 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 “Chapter 2. Unit Reference Codes” on page 17). Do not exchange the FRU that you exchanged in this procedure. If the failing item list contains FI codes, see “Failing Items” on page 539 to help determine part numbers and location in the system.

This ends the procedure.

SDIOP-PIP17

Introduction: This procedure isolates problems that are associated with SCSI bus configuration errors and device task initialization failures.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

1. Were you performing an IPL from removable media (IPL type D) when the error occurred?

No **Yes**

↓ Exchange the FRUs in the failing item list for the reference code that sent you to this procedure.

2. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does an SRC appear on the control panel?

No **Yes**

↓ Go to step 6 of this procedure.

3. Does the Disk Configuration Error Report display or the Disk Configuration Warning Report display appear on the console?

Yes **No**

↓ Go to step 5 of this procedure.

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 **Yes**

↓ Select option 5, then press F11, then press the Enter key to display the details.

If all of the reference codes are 0000, go to “LIC-PIP11” on page 337 and use cause code 0002. If any of the reference codes are not 0000, go to step 6 of this procedure 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. Look at the product activity log (see “Product Activity Log” in the *AS/400 Service Functions* information).

Is an SRC logged as a result of this IPL?

Yes **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 “Chapter 2. Unit Reference Codes” on page 17). If the failing item list contains FI codes, see “Failing Items” on page 539 to help determine part numbers and location in the system.

This ends the procedure.

6. Record the SRC on the Problem Summary Form (see “Appendix A. Problem Summary Form” on page 895).

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

Yes **No**

↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see “Starting Point For All Problems” on page 3).

This ends the procedure.

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7. Determine the device unit reference code (URC) from the SRC. If the Disk Configuration Error Report display or 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. (See "System Reference Code (SRC) Record" in the *AS/400 Service Functions* information).

Is the device unit reference code 3020, 3021, or 3022?

Yes **No**

↓ Go to step 9 of this procedure.

8. A unit reference code of 3020, 3021, or 3022 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 "Expansion Tower Locations and Addresses" on page 687).

- b. The unit reference code indicates the SCSI bus that has the problem:

URC SCSI Bus

3020 0

3021 1

3022 2

To find the bus and device locations, see "Expansion Tower Locations and Addresses" on page 687.

- c. 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.

If you need to perform isolation on the SCSI bus, go to "SDIOP-PIP16" on page 423.

This ends the procedure.

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

Find the device unit address from the SRC (see "SRC Address Formats" on page 878). 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?

Yes **No**

↓ Go to step 12 of this procedure.

10. Perform the following:

- a. Exchange the device.
- b. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does this correct the problem?

No **Yes**

↓ **This ends the procedure.**

11. Ask your next level of support for assistance.

This ends the procedure.

12. Perform the following:

- a. Remove the device.
- b. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does this correct the problem?

No **Yes**

↓ **This ends the procedure.**

13. Ask your next level of support for assistance.

This ends the procedure.

SDIOP-PIP18

Introduction: This procedure isolates problems that are associated with SCSI bus configuration errors and device task initialization failures.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

1. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does an SRC appear on the control panel?

No **Yes**

↓ Go to step 5 of this procedure.

2. Does the Disk Configuration Error Report display or the Disk Configuration Warning Report display appear on the console?

Yes **No**

↓ Go to step 4 of this procedure.

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 **Yes**

↓ Select option 5, then press F11, then press the Enter key to display the details.

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If all of the reference codes are 0000, go to "LIC-PIP11" on page 337 and use cause code 0002. If any of the reference codes are not 0000, go to step 5 of this procedure 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 "Product Activity Log" in the *AS/400 Service Functions* information).

Is an SRC logged as a result of this IPL?

Yes **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 "Chapter 2. Unit Reference Codes" on page 17). If the failing item list contains FI codes, see "Failing Items" on page 539 to help determine part numbers and location in the system.

This ends the procedure.

5. Record the SRC on the Problem Summary Form (see "Appendix A. Problem Summary Form" on page 895).

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

Yes **No**

- ↓ A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem (see "Starting Point For All Problems" on page 3).

This ends the procedure.

6. Determine the device unit reference code (URC) from the SRC. If the Disk Configuration Error Report display or 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. (See "Stage 1 System Reference Code (SRC) Definition" in the *AS/400 Service Functions* information).

Is the device unit reference code 3020?

Yes **No**

- ↓ Go to step 8 of this procedure.

7. 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.

Find the printout that shows the system configuration from the last IPL and compare it to the present system configuration.

Note: Use the unit address and the physical address in the SRC to help you with this comparison. If configuration is not the problem, a device on the SCSI bus may be failing. Use FI code FI00884 to help find the failing device. If you need to perform isolation on the SCSI bus, go to "SDIOP-PIP16" on page 423.

This ends the procedure.

8. 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?

Yes No

↓ Go to step 11 of this procedure.

9. Perform the following:

- a. Exchange the device.
- b. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does this correct the problem?

No Yes

↓ **This ends the procedure.**

10. Ask your next level of support for assistance.

This ends the procedure.

11. Perform the following:

- a. Remove the device.
- b. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does this correct the problem?

No Yes

↓ **This ends the procedure.**

12. Ask your next level of support for assistance.

This ends the procedure.

SDIOP-PIP19

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

This procedure isolates the problem when the I/O card reports (during the IPL) that the cache adapter card is not the one it had at the last power off.

You were sent to this procedure from URC 9010, 9011, or 9013.

1. Go to SST or DST to determine if any other SRCs have occurred at about the same time as this error. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

Have any other I/O card or device SRCs occurred at about the same time as this error?

No Yes

↓ Use the other I/O card or device SRCs to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17)

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This ends the procedure.

2. Has the I/O card, or have the devices been repaired or reconfigured recently?

Yes No

- ↓ Note any other errors that occurred at about the same time for the same I/O card. Then ask your next level of support for assistance.

This ends the procedure.

3. Find the location of the I/O card with the cache adapter card problem by performing one of the following:
- If you can enter a command at the console, access system service tools (SST) (see "System Service Tools (SST)" in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC. Press the F9 key for address information in the Product Activity Log entry for this SRC. Get the Physical location of the I/O card.
 - If you cannot enter a command at the console, perform an IPL to DST (see "Dedicated Service Tools (DST)" in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC. Press the F9 key for address information in the Product Activity Log entry for this SRC. Get the Physical location of the I/O card.

If you cannot perform a type A or B IPL, perform a type D IPL from removable media. Select the *Product Activity Log* option and display the Product Activity Log for this SRC. 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. See "Expansion Tower Locations and Addresses" on page 687 for location information. 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.

Have you determined the location of the I/O card that is reporting the problem?

Yes No

- ↓ Ask your next level of support for assistance.

This ends the procedure.

4. **Attention:** If the URC is 9010, the I/O card needs to retrieve data from the correct cache adapter card. If the correct cache adapter card is not installed, customer data will be lost.

Attention: If the URC is 9011 or 9013, the cache adapter card has data in its storage that may belong to another I/O card. Customer data from the other I/O card may be lost.

Do you want to continue with the cache adapter card that is installed now and accept the data loss?

No Yes

- ↓ Go to step 8 of this procedure.

5. The correct cache adapter card must be installed in the I/O card. Find the cache adapter card that was removed from the I/O card.

Did you find the correct cache adapter card?

Yes **No**

↓ Go to step 7 of this procedure.

6. Perform the following:
 - a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Install the correct cache adapter card that you found (see “Chapter 4. Removal and Installation Procedures” on page 593).
 - c. Select the IPL type and mode that are used by the customer (see *AS/400 Service Functions*).
 - d. Power on the system.
 - e. Go to step 9 of this procedure.

7. You may remove the cache adapter card and continue without a card temporarily. This will cause degraded performance until a card is installed.

Attention: When you install a new cache adapter card or continue without one, customer data is lost.

To continue without a cache adapter card, perform the following:

- a. Power off the system.
 - b. Remove the cache adapter card.
8. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information). If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

Attention: Continuing with this option will cause the loss of customer data. Reclaim the cache adapter card storage (see “Reclaim IOP Cache Storage” on page 892).

Note: The system operator may want to restore data from the most recent saved tape after you complete the repair.

9. Does the IPL complete successfully?

No **Yes**

↓ **This ends the procedure.**

10. Go to “Starting Point For All Problems” on page 3 to correct the problem.
This ends the procedure.

SDIOP-PIP20

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

This procedure isolates the problem when two or more devices are missing from a disk array.

You were sent to this procedure from URC 9020 or 9021.

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1. Go to SST or DST to determine if any other SRCs have occurred at about the same time as this error. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

Have any other I/O card or device SRCs occurred at about the same time as this error?

No **Yes**

- ↓ Use the other I/O card or device SRCs to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17)

This ends the procedure.

2. Has the I/O card, or have the devices been repaired or reconfigured recently?

Yes **No**

- ↓ Note any other errors that occurred at about the same time for the same I/O card. Then ask your next level of support for assistance.

This ends the procedure.

3. Display the Product Activity Log entry that is associated with this SRC by performing one of the following:

- If you can enter a command at the console, select system service tools (SST) (see “System Service Tools (SST)” in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC.
- If you cannot enter a command at the console, perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC.

If you cannot perform a type A or B IPL, perform a type D IPL from removable media. Select the *Product Activity Log* option and display the Product Activity Log for this SRC.

4. Use the Product Activity Log entry that you found in step 3 of this procedure. Find and record all the array members that have both a present address of 0 and an expected address that is not 0. For a type A or B IPL, view the “Additional Information” to see the formatted log information. For a type D IPL, see “More Information from Hexadecimal Reports” in the *AS/400 Service Functions*.

These devices are missing from the disk array.

Note: There may be multiple displays of data. Ensure that you check all displays that are associated with the error.

5. 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, continue with step 6 of this procedure.

- b. Stop the disk array that contains the missing devices.

Attention: Customer data may be lost.

If you want to continue with this repair option, go to step 8 of this procedure.

- 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 10 of this procedure.

6. Perform the following:
 - a. Install the missing devices in the correct locations in the system (see “Chapter 4. Removal and Installation Procedures” on page 593).
 - b. Power on the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).

Does the IPL complete successfully?

No **Yes**

↓ **This ends the procedure.**

7. Go to “Starting Point For All Problems” on page 3 to correct the problem.

This ends the procedure.

8. You have chosen to stop the disk array that contains the missing devices.

Attention: Customer data may be lost.

Perform the following:

- a. If you are not already using dedicated service tools, perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

- b. Select the *Work with disk units* option.

Did you get to DST with a Type D IPL?

Yes **No**

↓

- 1) Select the *Work with disk configuration* option.
- 2) Select the *Work with device parity protection* option.

Then continue with the next step of this procedure.

- c. Select the *Stop device parity protection* option.
- d. Follow the online instructions to stop device parity protection.
- e. Perform an IPL from disk.

Does the IPL complete successfully?

No **Yes**

↓ **This ends the procedure.**

9. Go to “Starting Point For All Problems” on page 3 to correct the problem.

This ends the procedure.

10. You have chosen to initialize and format the remaining members of the disk array.

Attention: Customer data will be lost.

Perform the following:

- a. If you are not already using dedicated service tools, perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

- b. Select the *Work with disk units* option.

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Did you get to DST with a Type D IPL?

Yes No

↓

- 1) Select the *Work with disk unit recovery* option.
- 2) Select the *Disk unit problem recovery procedures* option.
- 3) Select the disk units on the display you identified in step 4 of this procedure.

Then continue with the next step of this procedure.

- c. Select the *Initialize and format disk unit* option.
- d. Follow the online instructions to format and initialize the disk units.
- e. Perform an IPL from disk.

Does the IPL complete successfully?

No Yes

↓ **This ends the procedure.**

11. Go to "Starting Point For All Problems" on page 3 to correct the problem.
This ends the procedure.

SDIOP-PIP21

Introduction:

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

This procedure determines 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. The disk array is running, but it is not protected.

You were sent to this procedure from URC 9025 or 9030.

1. Find the address of the I/O card that is reporting the problem, by performing one of the following:
 - If you can enter a command at the console, access system service tools (SST) (see "System Service Tools (SST)" in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC. Press the F9 key for address information in the Product Activity Log entry for this SRC. This is the I/O card address.
 - If you cannot enter a command at the console, perform an IPL to DST (see "Dedicated Service Tools (DST)" in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC. Press the F9 key for address information in the Product Activity Log entry for this SRC. This is the I/O card address.
2. Perform the following:
 - a. Return to the SST or DST main menu.
 - b. Select the *Work with disk units* option.
 - c. Select the *Display disk configuration* option.

- d. Select the *Display disk configuration status* option.
- e. On the Display disk configuration status display, look for the devices attached to the I/O card that is identified in step 1 of this procedure.
- f. 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 the *Display Disk Unit Details* option. Then select the *Display Detailed Address* option and record the device address.
- g. See “Expansion Tower Locations and Addresses” on page 687 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 **No**

↓ Ask your next level of support for assistance.

This ends the procedure.

3. Exchange the disk unit that is causing the problem (see “Start Disk Service Here” on page 837).

This ends the procedure.

SDIOP-PIP22

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

1. Display the Product Activity Log entry that is associated with this SRC by performing one of the following:
 - If you can enter a command at the console, select system service tools (SST) (see “System Service Tools (SST)” in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC.
 - If you cannot enter a command at the console, perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC.

If you cannot perform a type A or B IPL, perform a type D IPL from removable media. Select the *Product Activity Log* option and display the Product Activity Log for this SRC.

For a type A or B IPL, view the “Additional Information” to see the formatted log information. For a type D IPL, see “More Information from Hexadecimal Reports” in the *AS/400 Service Functions*.

Record all the information in the Product Activity Log entry for this SRC.

2. 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.

SDIOP-PIP23

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

This procedure corrects the problem when the system cannot find the required cache data for the attached disk units.

Note: For some storage I/O adapters, the cache card is integrated and not removable.

You were sent to this procedure from URC 9050.

1. Have any other I/O card or device SRCs occurred at about the same time as this error?

No **Yes**

↓ Use the other I/O card or device SRCs to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17)

This ends the procedure.

2. Has the I/O card, or have the devices been repaired or reconfigured recently?

Yes **No**

↓ Note any other errors that occurred at about the same time for the same I/O card. Then ask your next level of support for assistance.

This ends the procedure.

3. Were both an I/O card **and** the cache adapter card exchanged during the last repair action or reconfiguration?

Yes **No**

↓ Go to step 7 of this procedure.

4. Can you find the original cache adapter card that was exchanged during the last repair action or reconfiguration?

Yes **No**

↓ Go to step 8 of this procedure.

5. Perform the following:

- a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Remove the cache adapter card from the I/O card and install the original cache adapter card (see “Chapter 4. Removal and Installation Procedures” on page 593).
- c. Select the IPL type and mode that are used by the customer (see *AS/400 Service Functions*).
- d. Start an IPL by powering on the system.

Does the IPL complete successfully?

Yes No

- ↓ This is a new problem. Go to “Starting Point For All Problems” on page 3.

This ends the procedure.

6. The repair action corrected the problem.

This ends the procedure.

7. Have disk units been moved from another I/O card to this I/O card?

Yes No

- ↓ Ask your next level of support for assistance.

This ends the procedure.

8. Display the Product Activity Log entry that is associated with this SRC by performing one of the following:

- If you can enter a command at the console, select system service tools (SST) (see “System Service Tools (SST)” in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC. Press the F9 key for address information in the Product Activity Log entry for this SRC. This is the I/O card address.
- If you cannot enter a command at the console, perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC. Press the F9 key for address information in the Product Activity Log entry for this SRC. This is the I/O card address.

If you cannot perform a type A or B IPL, perform a type D IPL from removable media. Select the *Product Activity Log* option and display the Product Activity Log for this SRC. 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.

For a type A or B IPL, view the “Additional Information” to see the formatted log information. For a type D IPL, see “More Information from Hexadecimal Reports” in the *AS/400 Service Functions*.

Record the addresses that are not 0000 0000 for all devices listed.

Note: There may be multiple displays of data. Ensure that you check all displays that are associated with the error.

9. See “Expansion Tower Locations and Addresses” on page 687 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 disk units with the problem?

Yes No

- ↓ Ask your next level of support for assistance.

This ends the procedure.

10. There are three possible ways to correct the problem:
 - Physically remove the disk units you identified in step 8 of this procedure and return them to their original location.
If you want to continue with this repair option, continue with step 11 of this procedure.
 - Initialize and format the disk units you identified in step 8 of this procedure.
Attention: Customer data will be lost.
If you want to continue with this repair option, go to step 12 of this procedure.
 - Perform an IPL to DST and perform the Reclaim Cache Storage procedure.
Attention: Customer data will be lost.
If you want to continue with this repair option, go to step 13 of this procedure.
11. You have chosen to remove the problem disk units.
Perform the following:
 - a. Physically remove the problem disk units and return them to their original location.

Note: The Product Activity Log I/O processor and cache adapter card information fields identify the type, serial number of the original I/O card, and cache adapter card to which the disk units should be returned.
 - b. Select the IPL type and mode that are used by the customer.
 - c. Power on the system.
 - d. Go to step 14 of this procedure.
12. You have chosen to initialize and format the disk units you identified in step 8 of this procedure.
Attention: Customer data will be lost.
Perform the following:
 - a. If you are not already using dedicated service tools, perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information). If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Select the *Work with disk units* option.
Did you get to DST with a Type D IPL?
Yes No
↓
 - 1) Select the *Work with disk unit recovery* option.
 - 2) Select the *Disk unit problem recovery procedures* option.
 - 3) Select the disk units on the display that you identified in step 8 of this procedure.
 Then continue with the next step of this procedure.
 - c. Select the *Initialize and format disk unit* option.
 - d. Follow the online instructions to format and initialize the disk units.
 - e. Perform an IPL from disk.

- f. Go to step 14 of this procedure.
13. You have chosen to perform an IPL to DST and perform the Reclaim Cache Storage procedure.
 Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information). If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 Reclaim the cache adapter card storage (see “Reclaim IOP Cache Storage” on page 892).
- Note:** The system operator may want to restore data from the most recent saved tape after you complete the repair.
14. Does the IPL complete successfully?
- No Yes**
- ↓ **This ends the procedure.**
15. Go to “Starting Point For All Problems” on page 3 to correct the problem.
This ends the procedure.

SDIOP-PIP25

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

This procedure isolates 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. Have any other I/O card or device SRCs occurred at about the same time as this error?
No Yes
 ↓ Use the other I/O card or device SRCs to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17).
This ends the procedure.
2. Has the I/O card, or have the devices been repaired or reconfigured recently?
Yes No
 ↓ Note any other errors that occurred at about the same time for the same I/O card. Then ask your next level of support for assistance.
This ends the procedure.
3. Display the Product Activity Log entry that is associated with this SRC by performing one of the following:
 - If you can enter a command at the console, select system service tools (SST) (see “System Service Tools (SST)” in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC. Press the F9 key for address information in the Product Activity Log entry for this SRC. This is the I/O card address.

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- If you cannot enter a command at the console, perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC. Press the F9 key for address information in the Product Activity Log entry for this SRC. This is the I/O card address.

If you cannot perform a type A or B IPL, perform a type D IPL from removable media. Select the *Product Activity Log* option and display the Product Activity Log for this SRC. 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.

4. For a type A or B IPL, view the “Additional Information” to see the formatted log information. For a type D IPL, see “More Information from Hexadecimal Reports” in the *AS/400 Service Functions*.

Record the addresses that are not 0000 0000 for all devices listed.

Note: There may be multiple displays of data. Ensure that you check all displays that are associated with the error.

See “Expansion Tower Locations and Addresses” on page 687 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?

Yes **No**

↓ Ask your next level of support for assistance.

This ends the procedure.

5. Have one or more devices been moved to this I/O card from another I/O card?

Yes **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 876.

Yes **No**

↓ Either change the I/O card mode or remove the devices from the I/O card (see “Start Disk Service Here” on page 837).

Note: You can remove disk units with out installing other disk units and the system will continue to operate.

This ends the procedure.

7. Do you want to continue using these devices with this I/O card?

Yes No

↓ Remove the devices from the I/O card (see “Start Disk Service Here” on page 837).

Note: You can remove disk units without installing another disk unit, and the system will continue to operate.

This ends the procedure.

8. Initialize and format the disk units.

Attention: Data on the disk unit will be lost.

Perform the following:

- a. Access SST or DST(see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

- b. Select the *Work with disk units* option.

Did you get to DST with a Type D IPL?

Yes No

↓ Select the *Work with disk unit recovery* option.

Then continue with the next step of this procedure.

- c. Select the *Initialize and format disk unit* option 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.
- d. The disk unit is now ready to be added to the system configuration.

This ends the procedure.

SDIOP-PIP26

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

This procedure corrects 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. Have any other I/O card or device SRCs occurred at about the same time as this error?

No Yes

↓ Use the other I/O card or device SRCs to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17).

This ends the procedure.

2. Has the I/O card, or have the devices been repaired or reconfigured recently?

Yes No

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- ↓ Note any other errors that occurred at about the same time for the same I/O card. Then ask your next level of support for assistance.

This ends the procedure.

3. Display the Product Activity Log entry that is associated with this SRC by performing one of the following:
 - If you can enter a command at the console, select system service tools (SST) (see “System Service Tools (SST)” in the *AS/400 Service Functions* information). Select the *Product Activity Log* option and display the Product Activity Log entry for this SRC. Press the F9 key for address information in the Product Activity Log entry for this SRC. This is the I/O card address.
 - If you cannot enter a command at the console, perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC. Press the F9 key for address information in the Product Activity Log entry for this SRC. This is the I/O card address.

If you cannot perform a type A or B IPL, perform a type D IPL from removable media. Select the *Product Activity Log* option and display the Product Activity Log for this SRC. 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.

4. For a type A or B IPL, view the “Additional Information” to see the formatted log information. For a type D IPL, see “More Information from Hexadecimal Reports” in the *AS/400 Service Functions*.

Record the addresses that are not 0000 0000 for all devices listed.

Note: There may be multiple displays of data. Ensure that you check all displays that are associated with the error.

See “Expansion Tower Locations and Addresses” on page 687 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?

Yes No

- ↓ Ask your next level of support for assistance.

This ends the procedure.

5. Have one or more devices been moved to this I/O card from another I/O card?

Yes No

- ↓ Ask your next level of support for assistance.

This ends the procedure.

6. Do you want to continue using these devices with this I/O card?

Yes No

- ↓ Remove the devices from the I/O card (see “Start Disk Service Here” on page 837).

Note: You can remove disk units without installing another disk unit, and the system will continue to operate.

This ends the procedure.

7. Initialize and format the disk units.

Attention: Data on the disk unit will be lost.

Perform the following:

- a. Access SST or DST.
- b. Select the *Work with disk units* option.
Did you get to DST with a Type D IPL?

Yes No

- ↓ Select the *Work with disk unit recovery* option.

Then continue with the next step of this procedure.

- c. Select the *Initialize and format disk unit* option 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.
- d. The disk unit is now ready to be added to the system configuration.

This ends the procedure.

SDIOP-PIP27

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

You were sent to this procedure with a unit reference code of 9051.

Note: For some storage I/O adapters, the cache card is integrated and not removable.

I/O card cache data exists for a missing or failed device. The possible causes are:

- 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.

Note: Any Function 08 power down (including from a D-IPL) is an Abnormal power off!

Perform the following:

1. Display the Product Activity Log entry for URC 9051 by performing one of the following:
 - If you can enter a command at the console, access system service tools (SST) (see "System Service Tools (SST)" in the *AS/400 Service Functions* information). Select the Product Activity Log option and display the Product Activity Log entry for this SRC. Press the F9 key for address information in the Product Activity Log entry for this SRC. This is the I/O card address.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media. Select the Product Activity Log option and display the Product Activity Log for this SRC. 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.

For a type A or B IPL, view the "Additional Information" to see the formatted log information. For a type D IPL, see "More Information from Hexadecimal Reports" in the *AS/400 Service Functions* information.

Record the device types and serial numbers for those devices that show a unit address of 0000 0000.

Note: There may be multiple displays of data. Ensure that you check all displays that are associated with the error.

See "Expansion Tower Locations and Addresses" on page 687 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.

2. If the devices from step 1 of this procedure have never been installed on this system, go to step 3 of this procedure. If the devices are not in the current system disk configuration, go to step 5 of this procedure. Otherwise, the devices are part of the system disk configuration; go to step 7 of this procedure.
3. If this I/O card and cache card were moved from a different system, go to step 4 of this procedure. Otherwise, the cache card was shipped to the customer without first being cleared. Make a note of both the serial number and the customer number, and the device types and their serial numbers. These were found in step 1 of this procedure. Then inform your next level of support. Then, go to step 6 of this procedure to clear the cache card and correct the URC 9051 problem.
4. You should 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.

5. 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, or they were removed after an abnormal power off, or they have failed. Go to step 6 of this procedure to clear the cache card and correct the URC 9051 problem.
6. 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 “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).
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 “Reclaim IOP Cache Storage” on page 892).
7. If this I/O card and cache card were moved from a different location on this system, go to step 4 of this procedure. If the devices from step 1 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 3 of this procedure. (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, go to step 8 of this procedure.
8. 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. This 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.

SDIOP-PIP28

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

You were sent to this procedure with a unit reference code of 9052.

Either cache data exists for a device that has been modified, or the cache card failed during system operation and became operational at the next system IPL.

1. Has a device currently under this storage I/O adapter been moved from a different I/O card?

No **Yes**

↓ **Attention:** Customer data may be lost.

Ask your next level of support for assistance.

This ends the procedure.

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2. The cache card failed during system operation and became available at the next IPL. Perform the following:
 - a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Remove the cache card.
 - c. Power on and IPL the system to DST.

If the problem is corrected, exchange the failing cache card (see “Chapter 4. Removal and Installation Procedures” on page 593).

Note: Disk units attached to the I/O card will continue to operate in degraded mode until the cache card is exchanged.

This ends the procedure.

SDIOP-PIP29

Introduction: The cache card is missing or failed.

You were sent to this procedure from URC 9012.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

1. Find the location of the I/O card with the cache adapter card problem by performing one of the following:
 - If you can enter a command at the console, access system service tools (SST) (see “System Service Tools (SST)” in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC. Press the F9 key for address information in the Product Activity Log entry for this SRC. Get the Physical location of the I/O card.
 - If you cannot enter a command at the console, perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information). Select the *Product activity log* option and display the Product Activity Log entry for this SRC. Press the F9 key for address information in the Product Activity Log entry for this SRC. Get the Physical location of the I/O card.
- If you cannot perform a type A or B IPL, perform a type D IPL from removable media. Select the *Product Activity Log* option and display the Product Activity Log for this SRC. 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. See “Expansion Tower Locations and Addresses” on page 687 for location information. 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.

Have you determined the location of the I/O card that is reporting the problem?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

2. The correct cache adapter card must be installed in the I/O card. Find the cache adapter card that was removed from the I/O card.

Attention: The I/O card needs to retrieve data from the correct cache adapter card. If the correct cache adapter card is not installed, customer data will be lost.

Did you find the correct cache adapter card?

Yes No

↓ Go to step 4 of this procedure.

3. Perform the following:

- a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Install the correct cache adapter card you found in step 2 (see “Chapter 4. Removal and Installation Procedures” on page 593).
- c. Select the IPL type and mode that are used by the customer (see *AS/400 Service Functions*).
- d. Power on the system.
- e. Go to step 5 of this procedure.

4. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information). If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

Attention: Continuing with this option will cause the loss of customer data. Reclaim the cache adapter card storage (see “Reclaim IOP Cache Storage” on page 892).

Note: The system operator may want to restore data from the most recent saved tape after you complete the repair.

5. Does the IPL complete successfully?

No Yes

↓ **This ends the procedure.**

6. Go to “Starting Point For All Problems” on page 3 to correct the problem.

This ends the procedure.

SDIOP-PIP30

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

This procedure corrects 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.

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1. Did you just exchange the storage I/O adapter as a result of a failure?
Yes No
↓ Go to “SDIOP-PIP23” on page 438.
This ends the procedure.
2. You have just exchanged a storage I/O adapter.
Attention: Customer data may be lost.
Perform the following:
 - a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Replace the new cache directory card with the original cache directory card from the failed storage I/O adapter (see “Cache Directory Card, For Type 2740, 2748” on page 624).
 - c. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information). If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

Note: This IPL will result in a 9010 URC. Ignore this and continue with the next steps.
3. Reclaim the cache storage (see “Reclaim IOP Cache Storage” on page 892).

Note: The system operator may want to restore data from the most recent saved tape after you complete the repair.
4. Does the IPL complete successfully?
Yes No
↓ Go to “Starting Point For All Problems” on page 3 to correct the problem.
This ends the procedure.
5. Before completing this service action, perform the following:
 - a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Replace the cache directory card from the failed storage I/O adapter with the cache directory card that came with the replacement storage I/O adapter that you exchanged in step 2b. (See “Cache Directory Card, For Type 2740, 2748” on page 624.)
 - c. Select the IPL type and mode that are used by the customer (see *AS/400 Service Functions*).
 - d. Power on the system.
6. Does the IPL complete successfully?
No Yes
↓ **This ends the procedure.**
7. Go to “Starting Point For All Problems” on page 3 to correct the problem.
This ends the procedure.

SDIOP-PIP31

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Introduction: Cache data associated with the attached devices cannot be found.

You were sent to this procedure from URC 9010.

1. Did you just exchange the storage I/O adapter as a result of a failure?

Yes **No**

↓ Go to step 6 of this procedure.

2. Reclaim the cache storage (see "Reclaim IOP Cache Storage" on page 892).

Note: 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?

Yes **No**

↓ Go to "Starting Point For All Problems" on page 3 to correct the problem.

This ends the procedure.

4. Before completing this service action, perform the following:

- a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
- b. Replace the cache directory card from the failed storage I/O adapter with the cache directory card that came with the replacement storage I/O adapter (see "Cache Directory Card, For Type 2740, 2748" on page 624).
- c. Select the IPL type and mode that are used by the customer (see *AS/400 Service Functions*).
- d. Power on the system.

5. Does the IPL complete successfully?

No **Yes**

↓ **This ends the procedure.**

6. Have the I/O cards been moved or reconfigured recently?

Yes **No**

↓ Go to step 9 of this procedure.

7. Perform the following:

- a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
- b. Restore all I/O cards to their original position.
- c. Select the IPL type and mode that are used by the customer (see *AS/400 Service Functions*).
- d. Power on the system.

8. Does the IPL complete successfully?

No **Yes**

↓ **This ends the procedure.**

9. Has the system been powered off for several days?

Yes **No**

SDIOP PIPs

↓ Ask your next level of support for assistance.

This ends the procedure.

10. The cache battery pack may be depleted. Do NOT replace the I/O adapter or the cache battery pack.

Reclaim the cache storage (see "Reclaim IOP Cache Storage" on page 892).

Note: The system operator may want to restore data from the most recent saved tape after you complete the repair.

11. Does the IPL complete successfully?

No Yes

↓ **This ends the procedure.**

12. Ask your next level of support for assistance.

This ends the procedure.

SDIOP-PIP32

Introduction:

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

You were sent to this procedure from 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. Did you just exchange the storage I/O adapter as a result of a failure?

Yes No

↓ Go to step 5 of this procedure.

2. You have just exchanged a storage I/O adapter.

Reclaim the cache storage (see "Reclaim IOP Cache Storage" on page 892).

3. Does the IPL complete successfully?

No Yes

↓ **This ends the procedure.**

4. Go to "Starting Point For All Problems" on page 3 to correct the problem.

This ends the procedure.

5. Have the I/O cards been moved or reconfigured recently?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

6. Perform the following:

- a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).

- b. Restore all I/O cards to their original position.

- c. Select the IPL type and mode that are used by the customer (see *AS/400 Service Functions*).
 - d. Power on the system.
7. Does the IPL complete successfully?
- No Yes**
- ↓ **This ends the procedure.**
8. Ask your next level of support for assistance.
- This ends the procedure.**

Storage Device I/O Card FRU Locations

Use Table 25 to find FRU locations. If only a type number is listed, go to the “Type, Model, and Part Number List” on page 750 to determine the part number. If the failing item is an FI code, see “Failing Items” on page 539.

Note: See “Expansion Tower Locations and Addresses” on page 687 to help find FRUs that are not in this table.

Table 25. Storage Device I/O card FRU Locations

FRU Description	Location Procedure
• Diskette adapter (type 6146 or type 6147)	Use the location information in the Service Action Log if it is available. If the location is not available, find the address. See “SRC Address Formats” on page 878. Use the address to find the location. See “Expansion Tower Locations and Addresses” on page 687.
Terminating plug	See “DEVTERM” on page 568 for more information. Also see “Expansion Tower Locations and Addresses” on page 687.

System Power Control Network (SPCN) Problem Isolation Procedures

Overview

This section contains the procedures necessary to isolate a failure in the system power control network (SPCN).

Attention: Disconnecting or removing the type 2620 or type 2628 cryptographic I/O processor causes the loss of the master encryption key. Read “Important Cryptographic I/O Processor Information” on page 884 before disconnecting or removing the cryptographic I/O processor.

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 FRU is located, (see “Powering On and Powering Off the System or Expansion Tower” on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

SPCN-PIP1 (FC 507x, 508x)

Introduction: This procedure isolates regulator problems in the expansion unit.

Read the “Overview” on page 453 before continuing with this procedure.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure only from the Primary partition’s console and the system control panel.

Procedure:

1. Perform the following:
 - a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Power on the system.

Does the same SRC that sent you to this procedure occur?

Yes No

↓ A different SRC or reference code occurred. Use the new SRC or reference code and go to “Starting Point For All Problems” on page 3.

This ends the procedure.

2. Perform the following:
 - a. Power off the system.
 - b. Do not remove the card enclosure AMD assembly.

Attention: To prevent overheating problems, do not remove any card completely from the card enclosure unless you install an airflow card in its place.
 - c. Disconnect all the cards (except the regulators) in the expansion card enclosure by sliding them partially out of the card enclosure.
 - d. Power on the system.

Does a regulator overcurrent SRC occur?

No Yes

↓ Go to step 6 of this procedure.

3. Perform the following:

- a. Power off the system.
- b. Connect one of the cards you disconnected in step 2 of this procedure.
- c. Power on the system.

Does a regulator fault SRC occur?

No **Yes**

- ↓ Exchange the regulator indicated by the SRC (see “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

4. Does a regulator SRC occur?

Yes **No**

- ↓ Repeat steps 3 and 4 of this procedure until you determine the failing card.

This ends the procedure.

5. Exchange the last card you reconnected in step 3 of this procedure (see “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

6. Perform the following:

- a. Power off the system.
- b. Remove all except one of the regulators.
- c. Power on the system.

Does the remaining regulator report an SRC?

Yes **No**

- ↓ Go to step 9 of this procedure.

7. Perform the following:

- a. Power off the system.
- b. Remove the remaining regulator and install one of the regulators you removed in step 6 of this procedure.
- c. Power on the system.

Does a regulator fault SRC occur?

Yes **No**

- ↓ Exchange the regulator you removed in this step.

This ends the procedure.

8. Exchange the following FRUs in the failing unit one at a time:

- a. AC module
- b. Card enclosure

Note: Exchange all the failing items for the SRC that sent you here before exchanging the card enclosure.

This ends the procedure.

9. Perform the following:

- a. Power off the system.
- b. Install one of the regulators that was disconnected in step 6 of this procedure.

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c. Power on the system.

Does a regulator fault SRC occur?

No **Yes**

↓ Exchange the regulator you just installed.

This ends the procedure.

10. Have all of the regulators that were removed in step 8 of this procedure been installed?

No **Yes**

↓ **This ends the procedure.**

11. Go to step 9 of this procedure.

SPCN-PIP10

Introduction: A power supply is failing on a expansion. A power supply with a blinking light (led) or unlit led in a powered on system is an indication of a failure.

Read the "Overview" on page 453 before continuing with this procedure.

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure only from the Primary partition's console and the system control panel.

1. Perform the following:

a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).

b. Power on the system.

Does the same SRC that sent you to this procedure occur?

Yes **No**

↓ A different SRC occurred. Use the new SRC and go to "Chapter 2. Unit Reference Codes" on page 17.

This ends the procedure.

2. Does a 1xxx 7404 SRC occur?

No **Yes**

↓ Go to step 21 on page 459 of this procedure.

3. Power off the system and disconnect the ac power cable.

4. Remove the covers. See "FC 5065 and FC 5066" on page 639.

5. Is the SRC on a FC 5065 expansion tower?

No **Yes**

↓ Go to step 28 on page 460.

6. Perform the following:

a. Disconnect all 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 (see "Removable Media — Dedicated and Concurrent" on page 666).

- b. Disconnect all cards (except regulators) from the front and rear by sliding them partially out of the card enclosure.
- c. Disconnect the feature power supplies (if installed) from the unit you are working on (see "FC 5065 or FC 5066" on page 663).
- d. Disconnect all battery power units by sliding them partially out of the enclosure. (1xxx A300 SRC will appear, disregard it during this procedure).
- e. Disconnect the disk expansion unit power cable (if installed) at the top of the card enclosure.
- f. Reconnect the ac power cable to the unit you are working on.
- g. Power on the system.

Does a power reference code occur?

No Yes

- ↓ Exchange the following, one at a time, until the problem is resolved:
 - a. AC module.
 - b. Regulators in the card enclosure.
 - c. Card enclosure AMD assembly.
 - d. Control panel.
 - e. Control panel cable.
 - f. Card enclosure.

This ends the procedure.

7. Were feature power supplies removed in step 6 on page 456 ?

Yes No

- ↓ Go to step 10 of this procedure. (Refer to "FC 5065, FC 5066 – Expansion Tower" on page 705.)

8. Perform the following:

- a. Power off the system.
- b. Disconnect the ac power cable to the unit you are working on.
- c. Reconnect one feature power supply (see "FC 5065 or FC 5066" on page 663).
- d. Reconnect the ac power cable to the unit you are working on.
- e. Power on the system.

Does a power reference code occur?

No Yes

- ↓ Exchange the last feature power supply you reconnected in this step (see "FC 5065 or FC 5066" on page 663).

This ends the procedure.

9. Have you reconnected all the feature power supplies?

Yes No

- ↓ Repeat step 8 of this procedure.

10. Perform the following:

- a. Power off the system.
- b. Disconnect the ac power cable to the unit you are working on.

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- c. Connect one battery power unit (see "Battery" on page 607).
- d. Connect the ac power cable to the unit you are working on.
- e. Power on the system.

Does a power reference code occur?

No **Yes**

- ↓ Exchange the last battery charger unit you connected in this step (see "Battery" on page 607).

This ends the procedure.

11. Have you reconnected all the battery power units?

Yes **No**

- ↓ Go to step 10 on page 457 of this procedure.

12. Perform the following:

- a. Power off the system.
- b. Reconnect all of the I/O devices (tape, diskette, or disk units) you disconnected in step 6 of this procedure.
- c. Power on the system.

Does a power reference code occur?

Yes **No**

- ↓ Go to 15.

13. Perform the following:

- a. Power off the system.
- b. Disconnect all of the I/O devices (tape, diskette, or disk units) you connected in step 12 of this procedure.
- c. Reconnect one of the I/O devices (tape, diskette, or disk units) you disconnected in 13b.
- d. Power on the system.

Does a power reference code occur?

No **Yes**

- ↓ Exchange the last I/O device you reconnected in this step (see "Removable Media — Dedicated and Concurrent" on page 666).

14. Have you reconnected all the I/O devices?

Yes **No**

- ↓ Repeat 13 except for 13b.

15. Is the storage expansion unit installed?

Yes **No**

- ↓ **This ends the procedure.**

16. Perform the following:

- a. Power off the system.
- b. Reconnect the storage expansion unit power cable (PWR20X) at the top of the card enclosure.
- c. Install the AMD.
- d. Power on the system.

Does a power reference code occur?

Yes No

↓ **This ends the procedure.**

17. Perform the following:

- a. Power off the system.
- b. Disconnect all the disk units by sliding them partially out of the storage expansion unit.
- c. Power on the system.

Does a power reference code occur?

No Yes

↓ Exchange the following, one at a time, (see “Chapter 4. Removal and Installation Procedures” on page 593.):

- a. Storage expansion unit adapter.
- b. Storage expansion unit power cable.

This ends the procedure.

18. Perform the following:

- a. Power off the system.
- b. Connect one disk unit you disconnected in step 17 of this procedure.
- c. Power on the system.

Does a power reference code occur?

No Yes

↓ Exchange the tray assembly of the last disk unit you connected in this step (see “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

19. 19. Have you reconnected all the disk units in the storage expansion unit?

Yes No

↓ Repeat 18.

20. **This ends the procedure.**

21. 21. Are feature power supplies installed?

Yes No

↓ Go to step 25 on page 460 of this procedure.

22. Perform the following:

- a. Power off the system.
- b. Remove the feature power supplies.
- c. Power on the system.

Does a 1xxx 7404 SRC occur?

No Yes

↓ Go to 25 on page 460.

23. Perform the following:

- a. Power off the system.
- b. Reconnect 1 of the feature power supplies removed in step 22 of this procedure.
- c. Power on the system.

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Does a 1xxx 7404 SRC occur?

No **Yes**

↓ Exchange the feature power supply reconnected in this step.

This ends the procedure.

24. Exchange the following one at a time:
 - a. Second feature power supply (if installed).
 - b. ACMODUL
 - c. BACKPLN

This ends the procedure.

25. Perform the following:
 - a. Power off the system.
 - b. Remove the battery charger units.
 - c. Power on the system.

Does a 1xxx 7404 SRC occur?

No **Yes**

↓ Go to step 27 of this procedure.

26. Perform the following:
 - a. Power off the system.
 - b. Install one of the battery charger units removed in step 25 of this procedure.
 - c. Power on the system.

Does a 1xxx 7404 SRC occur?

No **Yes**

↓ Exchange the battery charger unit installed in this step.

27. Exchange the following one at a time:
 - a. Second battery charger unit (if installed)
 - b. ACMODUL
 - c. BACKPLN

This ends the procedure.

28. Perform the following:
 - a. Disconnect all 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 (see Chapter 6, "Removal and Installation Procedures" in topic 2.1).
 - b. Remove and label all cards that are installed in the PCI card area.
 - c. Reconnect the ac power cable to the unit you are working on.
 - d. Power on the system.

Does a power reference code occur?

Yes **No**

↓ Go to step 37 on page 461 of this procedure.

29. Perform the following:
 - a. Power off the system.
 - b. Remove power supplies P02 and P03.
 - c. Power on the system.

Does a power reference code occur?

No **Yes**

↓ Go to step 32 of this procedure.

30. Perform the following:

- a. Power off the system.
- b. Reconnect power supply P02 removed in step 29 on page 460 of this procedure.
- c. Power on the system.

Does a power reference code occur?

No **Yes**

↓ Exchange the power supply P02 reconnected in this step.

This ends the procedure.

31. Exchange power supply P03.

This ends the procedure.

32. Perform the following:

- a. Power off the system.
- b. Remove power supply P01.
- c. Reconnect power supply P02 or P03.
- d. Power on the system.

Does a power reference code occur?

Yes **No**

↓ Exchange the power supply P01.

This ends the procedure.

33. Perform the following:

- a. Remove one of the AMDs from the system that was not previously removed during this procedure. (Disregard a AMD SRC if it occurs during this step.)
- b. Power on the system.

Does a power reference code occur?

Yes **No**

↓ The AMD you removed in this step is the failing item.

This ends the procedure.

34. Have you removed all of the AMDs one at a time?

No **Yes**

↓ Install all the AMDs and continue with step 35 of this procedure.

35. Perform the following:

- a. Power off the system.
- b. Install the AMD that was removed in step 33 in the original location.
- c. Go to step 33 of this procedure.

36. Replace BACKPLN.

This ends the procedure.

37. Perform the following:

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- a. Power off the system.
- b. Reconnect all cards that you removed in step 28 on page 460.
- c. Reconnect the ac power cable to the unit you are working on.
- d. Power on the system.

Does a power reference code occur?

Yes **No**

↓ Go to step 40 of this procedure.

38. Perform the following:

- a. Power off the system.
- b. Disconnect one of the cards you connected in step 37 on page 461 of this procedure.
- c. Power on the system.

Does a power reference code occur?

Yes **No**

↓ Exchange the last card you disconnected in this step.

This ends the procedure.

39. Have you disconnected all the cards?

Yes **No**

↓ Repeat step 38 of this procedure.

40. Perform the following:

- a. Power off the system.
- b. Reconnect all of the I/O devices (tape, diskette, or disk units) you disconnected in step 28 on page 460 of this procedure.
- c. Power on the system.

Does a power reference code occur?

Yes **No**

↓

This ends the procedure.

41. Perform the following:

- a. Power off the system.
- b. Disconnect all of the I/O devices (tape, diskette, or disk units) you connected in step 40 of this procedure.
- c. Reconnect one of the I/O devices (tape, diskette, or disk units) you connected in this step 41b of this procedure.
- d. Power on the system.

Does a power reference code occur?

No **Yes**

Exchange the last I/O device you reconnected in this step.

This ends the procedure.

42. Have you reconnected all the I/O devices?

Yes **No**

↓ Repeat step 41 of this procedure, except for step 41b.

43. Replace BACKPLN.

This ends the procedure.

SPCN-PIP20

Introduction: This procedure verifies that the lights and display on the System Unit and all attached Expansion Units are operating correctly:

- System Unit
- FC 503x System Unit Expansion
- FC 505x Storage Expansion Unit
- FC 506x PCI Expansion Frame
- FC 507x System Unit Expansion
- FC 508x Storage Expansion Tower

Read the “Overview” on page 453 before continuing with this procedure.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure only from the Primary partition’s console and the system control panel.

Procedure:

1. Perform the following:
 - a. Select function 04 (Lamp Test) on the control panel (see *AS/400 Service Functions*).
 - b. Press the Enter key.
2. Look at the display panels on the System Unit and all attached Expansion Units.

Note: The SPCN lamp test is active for only 25 seconds after you press the Enter key.

Are all of the following lights on for the System Unit and all attached Expansion Units?

- Power-on light.
- Attention light.
- A five-by-seven dot pattern for the 8 or 32-character display as installed.

No **Yes**

↓ These control panel lights are working correctly.

This ends the procedure.

3. Exchange the following FRUs in the failing unit one at a time (see “Chapter 4. Removal and Installation Procedures” on page 593):
 - a. Control panel (CTLPNL)
 - b. Tower card (TWRCARD)
 - c. Control panel cable

This ends the procedure.

SPCN-PIP21 (503x)

Introduction: This procedure verifies that the Remote Control Panel is operating correctly.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure only from the Primary partition’s console and the system control panel.

Procedure:

1. Select function 04 (Lamp Test) on the control panel by clicking on the↑ until 04 appears, then click on Enter.
2. Look at the display panels on the System Unit.

Are all of the following lights on?

- Power-on light
- Attention light
- Manual light
- Normal light
- Auto light
- Secure light
- The 8-character display segments

No Yes

↓ The control panel lights are working correctly.

This ends the procedure.

3. Exchange the following FRU in the failing unit
 - Remote Control Panel cable – 97H7591
 - Operations Console Configuration cable — 97H7557

This ends the procedure.

SPCN-PIP21 (5077)

Introduction: This procedure verifies that the Remote Control Panel is operating correctly.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure only from the Primary partition’s console and the system control panel.

Procedure:

1. Select function 04 (Lamp Test) on the control panel by clicking on the↑ until 04 appears, then click on Enter.
2. Look at the display panels on the System Unit.

Are all of the following lights on?

- Power-on light

- Attention light
- Manual light
- Normal light
- Auto light
- Secure light
- The 8-character display segments

No Yes

↓ The control panel lights are working correctly.

This ends the procedure.

3. Exchange the following FRU in the failing unit
 - Remote Control Panel cable – 97H7584
 - Operations Console Configuration cable — 97H7556

This ends the procedure.

Tape I/O Processor Problem Isolation Procedures

Overview

This section contains the procedures necessary to isolate a failure that the tape I/O processor (TIOP) has detected during an alternate IPL.

The System/370-type sequences are specifically for the 3422/3430 and 3480/3490 Tape Units. Therefore, the attachment of other System/370 devices is not valid.

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 or Expansion Tower” on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

Read and understand the following service procedures before using this section:

- “Powering On and Powering Off the System or Expansion Tower” on page 868

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- “Cards” on page 615

TIOP-PIP1 (503x)

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

This procedure isolates problems on the System/370 interface for the tape I/O processor (TIOP). It explains how to find the TIOP, the I/O device, System/370 interface cables, and terminating plugs. After you verify that the cables are correct, use an isolation procedure to find the failing part.

Read the “Overview” on page 465 before continuing with this procedure.

1. See “Tape I/O Processor Failing Items” on page 494 to find the TIOP, interface adapter cable, System/370 interface cables, I/O devices, and terminating plugs. Verify the following, and correct if necessary before continuing with the next step of this procedure:

- Ensure that all cable connections are correct and are tight.
- Ensure that there are no pushed-back or damaged pins on the interface cable connectors, adapter cable connectors, terminating plugs, or device connectors.
- Ensure that the Bus and Tag cables are in the correct location, between the Interface Adapter cable box and the I/O device control unit. The Bus cable goes to Bus-in, and the Tag cable goes to Tag-in. The dark-colored connectors attach to the light-colored connectors.
- Ensure that the Bus terminating plug is in the Bus-Out location in the device control unit. Ensure that the Tag terminating plug is in the Tag-Out location in the device control unit.

Note: The 3490E Model Cxx has only one terminating plug.

- Ensure that all I/O devices have the correct address, as indicated in the system configuration list.
- Ensure that all I/O devices are powered on. The I/O device should be ready for use and either enabled or online. If necessary, see the service information for the specific I/O device.
- Set the service switches on the device to the Off or Normal position if they are not already set.

2. Perform the following:

- a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Power on the system in manual mode (see *AS/400 Service Functions*).

Does the IPL complete successfully?

No **Yes**

↓ **This ends the procedure.**

3. Perform the “System/370 Interface Cable Wrap Test (503x)” on page 470. Then return here and answer the following question.

Did you find and correct a problem?

No Yes

↓ **This ends the procedure.**

4. Go to the service information for the specific tape unit and perform the procedures for an interface or channel problem. After completing the tape unit procedures, return to this step and answer the following question.

Did you find and correct a problem?

No Yes

↓ **This ends the procedure.**

5. Exchange the Bus terminating plug and Tag terminating plug in the I/O device control unit.
6. Perform the following:
 - a. Power off the system.
 - b. Power on the system in manual mode

Does the IPL complete successfully?

No Yes

↓ **This ends the procedure.**

7. Exchange the TIOP card (see “Chapter 4. Removal and Installation Procedures” on page 593).

Does the IPL complete successfully?

No Yes

↓ **This ends the procedure.**

8. Ask your next level of support for assistance.
This ends the procedure.

TIOP-PIP1 (5077)

This procedure isolates problems on the System/370 interface for the tape I/O processor (TIOP). It explains how to find the TIOP, the I/O device, System/370 interface cables, and terminating plugs. After you verify that the cables are correct, use an isolation procedure to find the failing part.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 465 before continuing with this procedure.

1. See “Tape I/O Processor Failing Items” on page 494 to find the TIOP, interface adapter cable, System/370 interface cables, I/O devices, and terminating plugs. Verify the following and correct if necessary before continuing with the next step of this procedure:
 - Ensure that all cable connections are correct and are tight.
 - Ensure that there are no pushed-back or damaged pins on the interface cable connectors, adapter cable connectors, terminating plugs, or device connectors.

Tape IOP PIPs

- Ensure that the Bus and Tag cables are in the correct location. They should be between the Interface Adapter cable box and the I/O device control unit. The Bus cable goes to Bus-In, and the Tag cable goes to Tag-In. The dark-colored connectors should be attached to the light-colored connectors.
- The Bus terminating plug should be in the Bus-Out location in the device control unit. The Tag terminating plug should be in the Tag-Out location in the device control unit.

Note: The 3490E Model Cxx has only one terminating plug.

- Ensure that all I/O devices have the correct address, as indicated in the system configuration list.
 - Ensure that all I/O devices are powered on and that the I/O device is ready and either enabled or online. If necessary, see the service information for the specific I/O device.
 - Ensure that the service switches on the device are set to the Off or Normal position.
2. Perform the following:
 - a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
 - b. Power on the system in manual mode (see *AS/400 Service Functions*).

Does the IPL complete successfully?

No Yes

↓ **This ends the procedure.**

3. Perform the "System/370 Interface Cable Wrap Test (5077)" on page 482. Then return here and answer the following question.

Did you find and correct a problem?

No Yes

↓ **This ends the procedure.**

4. Go to the service information for the specific tape unit and perform the procedures for an interface or channel problem. After completing the tape unit procedures, return to this step and answer the following question.

Did you find and correct a problem?

No Yes

↓ **This ends the procedure.**

5. Exchange the Bus terminating plug and the Tag terminating plug in the I/O device control unit.

6. Perform the following:

- a. Power off the system.
- b. Power on the system in manual mode

Does the IPL complete successfully?

No Yes

↓ **This ends the procedure.**

7. Exchange the TIOP card (see "Chapter 4. Removal and Installation Procedures" on page 593).

Does the IPL complete successfully?

No Yes

↓ **This ends the procedure.**

8. Ask your next level of support for assistance.

This ends the procedure.

TIOP-PIP5 (503x)

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

This procedure isolates the cause of an assign command failure.

Read the “Overview” on page 465 before continuing with this procedure.

1. Ask the system operator if the tape subsystem is shared with other systems.

Is the tape subsystem shared with other systems?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

2. Ask the system operator if another system was controlling the tape subsystem when the SRC that sent you here occurred.

Was another system controlling the tape subsystem when the SRC that sent you here occurred?

No Yes

↓ Wait for the other system to finish using the tape subsystem. Then ask the system operator to vary off the tape drive on the other system.

This ends the procedure.

3. Ask your next level of support for assistance.

This ends the procedure.

TIOP-PIP5 (5077)

This procedure isolates the cause of an assign command failure.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 465 before continuing with this procedure.

1. Ask the system operator if the tape subsystem is shared with other systems.

Is the tape subsystem shared with other systems?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

Tape IOP PIPs

2. Ask the system operator if another system was controlling the tape subsystem when the SRC that sent you here occurred.

Was another system controlling the tape subsystem when the SRC that sent you here occurred?

No **Yes**

- ↓ Wait for the other system to finish using the tape subsystem. Then ask the system operator to vary off the tape drive on the other system.

This ends the procedure.

3. Ask your next level of support for assistance.

This ends the procedure.

System/370 Interface Cable Wrap Test (503x)

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

This procedure determines if the tape I/O processor (TIOP) card or one of the cables that connects the TIOP to the tape device is failing. If a cable is failing, perform further analysis to find the failing signal lines. You may repair or exchange a failing cable.

Notes:

1. To perform this procedure, the tape unit must be the alternate IPL device.
2. To perform this procedure, you need one or both of the following:
 - Channel wrap block 1 (part 62X3403)
 - Channel wrap block 2 (part 6473051)

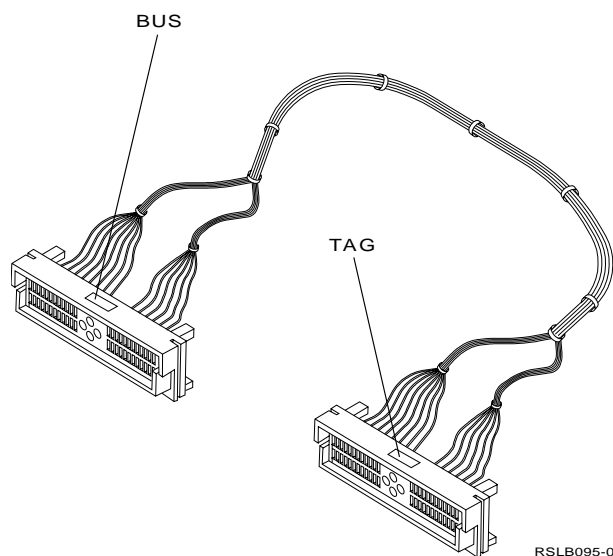
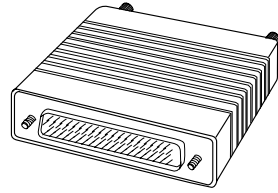


Figure 13. Channel Wrap Block 1, part 62X3403



RV2A368-0

Figure 14. Channel Wrap Block 2, part 6473051

These channel wrap blocks are stored with the system tools.

The tape subsystem configuration of the system determines the channel wrap blocks you need.

1. Is a 3490 Model Cxx Tape Unit connected to the system?

No **Yes**

↓ Go to step 27 of this procedure.

2. The tape subsystem cables connect as shown in Figure 15.

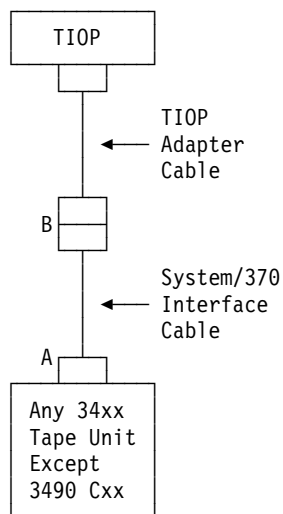


Figure 15. Tape Subsystem Cable Connections

Perform the following:

- a. Disconnect the System/370 interface cable from the I/O device control unit (at **A** in Figure 15).
 - b. Connect channel wrap block 1, part 62X3403, to the end of the System/370 interface cable (Bus to Bus and Tag to Tag). The channel wrap block 1 is stored with the system tools.
3. Perform the following:
 - a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Select IPL type D in manual mode (see *AS/400 Service Functions*).
 - c. Power on the system.

Does a TIOP reference code occur?

Tape IOP PIPs

Note: This may take up to 5 minutes.

No **Yes**

↓ Go to step 6 of this procedure.

4. Does a different reference code occur?

Yes **No**

↓ Ask your next level of support for assistance.

This ends the procedure.

5. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

6. Read the TIOP unit reference code (4 rightmost characters).

Does TIOP unit reference code 3100 occur (word 1 SRC 26xx 3100)?

No **Yes**

↓ This is the normal reference code when the channel wrap block is connected and the cable string is not failing. The tape unit may be causing the problem.

Perform the following:

- a. Disconnect the channel wrap block from the device end of the System/370 interface cable.
- b. Reconnect the cable to the I/O device control unit.
- c. Return to the procedure that sent you here.

This ends the procedure.

7. Does TIOP reference code 3090 occur?

No **Yes**

↓ Go to step 10 of this procedure.

8. Does a different reference code occur?

Yes **No**

↓ Ask your next level of support for assistance.

This ends the procedure.

9. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

10. The wrap test detected a cable failure or TIOP card failure.

Perform the following:

- a. Disconnect channel wrap block 1 from the end of the System/370 interface cable.
- b. Disconnect the TIOP adapter cable from the System/370 interface cable (at **B** in Figure 15 on page 471).
- c. Connect channel wrap block 1 to the end of the TIOP adapter cable.

11. Perform the following:

- a. Power off the system.
- b. Select IPL type D in manual mode.
- c. Power on the system.

Does a TIOP reference code occur?

Note: This may take up to 5 minutes.

No Yes

↓ Go to step 14 of this procedure.

12. Does a different reference code occur?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

13. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

14. Read the TIOP unit reference code (4 rightmost characters).

Does TIOP unit reference code 3100 occur (word 1 SRC 26xx 3100)?

No Yes

↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The System/370 interface cable (the one you disconnected from the cable string in step 10 of this procedure) is the failing item. Go to step 61 of this procedure.

15. Does TIOP reference code 3090 occur again?

No Yes

↓ Go to step 18 of this procedure.

16. Does a different reference code occur?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

17. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

18. You have isolated the problem to either the TIOP adapter cable or the TIOP card.

Perform the following:

- a. Power off the system.
- b. Exchange the TIOP card (see “Chapter 4. Removal and Installation Procedures” on page 593).
- c. Select IPL type D in manual mode.
- d. Power on the system.

Does TIOP reference code 3090 occur again?

No Yes

↓ Go to step 22 of this procedure.

19. Does TIOP unit reference code 3100 occur?

No Yes

↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The failing item is the TIOP card, which you exchanged in step 18 of this procedure.

Perform the following:

Tape IOP PIPs

- a. Disconnect the channel wrap block from the end of the TIOP adapter cable.
- b. Reconnect the TIOP adapter cable to the System/370 interface cable.
- c. Reconnect the System/370 interface cable to the I/O device control unit.
- d. Return to the procedure that sent you here.

This ends the procedure.

20. Does a different reference code occur?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

21. Go to "Chapter 2. Unit Reference Codes" on page 17 to correct the problem.

This ends the procedure.

22. Perform the following:

- a. Disconnect the channel wrap block from the end of the TIOP adapter cable.
- b. Exchange the TIOP adapter cable that is connected to the TIOP card.

23. Perform the following:

- a. Power off the system.
- b. Select IPL type D in manual mode.
- c. Power on the system.

Does TIOP reference code 3090 occur again?

No Yes

↓ Ask your next level of support for assistance.

This ends the procedure.

24. Does TIOP unit reference code 3100 occur?

No Yes

↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The failing item is the TIOP adapter cable, which you exchanged in step 22 of this procedure.

Perform the following:

- a. Reconnect the TIOP adapter cable to the System/370 interface cable.
- b. Reconnect the System/370 interface cable to the I/O device control unit.
- c. Return to the procedure that sent you here.

This ends the procedure.

25. Does a different reference code occur?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

26. Go to "Chapter 2. Unit Reference Codes" on page 17 to correct the problem.

This ends the procedure.

27. You are here because a 3490 Model Cxx is connected to the system.
Is a System/370 interface cable connected in the cable string between the TIOP and the 3490 Model Cxx?

Yes No

↓ Go to step 66 of this procedure.

28. The tape subsystem cables connect as shown in Figure 16.

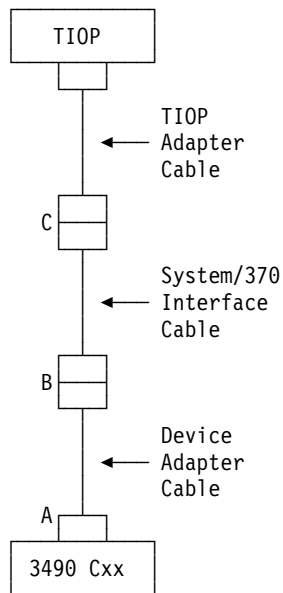


Figure 16. Tape Subsystem Cable Connections

Perform the following:

- a. Disconnect the device adapter cable from the I/O device control unit (at **A** in Figure 16).
 - b. Connect channel wrap block 2, part 6473051, to the device end of the device adapter cable. The channel wrap block 2 is stored with the system tools.
29. Perform the following:
- a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
 - b. Select IPL type D in manual mode (see *AS/400 Service Functions*).
 - c. Power on the system.

Does a TIOP reference code occur?

Note: This may take up to 5 minutes.

No Yes

↓ Go to step 32 of this procedure.

30. Does a different reference code occur?

Yes No

↓ Ask your next level of support for assistance.

Tape IOP PIPs

This ends the procedure.

31. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

32. Read the TIOP unit reference code (4 rightmost characters).

Does TIOP unit reference code 3100 occur (word 1 SRC 26xx 3100)?

No Yes

- ↓ This is the normal reference code when the channel wrap block is connected and the cable string is not failing. The tape unit may be causing the problem.

Perform the following:

- a. Disconnect the channel wrap block from the device end of the device adapter cable.
- b. Reconnect the cable to the I/O device control unit.
- c. Return to the procedure that sent you here.

This ends the procedure.

33. Does TIOP reference code 3090 occur?

No Yes

- ↓ Go to step 36 of this procedure.

34. Does a different reference code occur?

Yes No

- ↓ Ask your next level of support for assistance.

This ends the procedure.

35. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

36. The wrap test detected a cable failure or TIOP card failure.

Perform the following:

- a. Disconnect channel wrap block 2 from the end of the device adapter cable.
- b. Disconnect the System/370 interface cable from the device adapter cable (at **B** in Figure 16 on page 475).
- c. Connect channel wrap block 1 (part 62X3403) to the end of the System/370 interface cable (Bus to Bus and Tag to Tag).

37. Perform the following:

- a. Power off the system.
- b. Select IPL type D in manual mode.
- c. Power on the system.

Does a TIOP reference code occur?

Note: This may take up to 5 minutes.

No Yes

- ↓ Go to step 40 of this procedure.

38. Does a different reference code occur?

Yes No

- ↓ Ask your next level of support for assistance.

This ends the procedure.

39. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

40. Read the TIOP unit reference code (4 rightmost characters).

Does TIOP unit reference code 3100 occur (word 1 SRC 26xx 3100)?

No Yes

- ↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The failing item is the device adapter cable, which you disconnected from the cable string in step 36 of this procedure.

Perform the following:

- a. Exchange the device adapter cable.
- b. Disconnect the channel wrap block from the end of the System/370 interface cable.
- c. Reconnect the System/370 interface cable to the device adapter cable.
- d. Reconnect the device adapter cable to the I/O device control unit.
- e. Return to the procedure that sent you here.

This ends the procedure.

41. Does TIOP reference code 3090 still occur?

No Yes

- ↓ Go to step 44 of this procedure.

42. Does a different reference code occur?

Yes No

- ↓ Ask your next level of support for assistance.

This ends the procedure.

43. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

44. You have isolated the problem to one of the remaining cables or to the TIOP card.

Perform the following:

- a. Disconnect channel wrap block 1 from the end of the System/370 interface cable.
- b. Disconnect the TIOP adapter cable from the System/370 interface cable (at **C** in Figure 16 on page 475).
- c. Connect channel wrap block 1 to the end of the TIOP adapter cable (Bus to Bus and Tag to Tag).

45. Perform the following:

- a. Power off the system.
- b. Select IPL type D in manual mode.
- c. Power on the system.

Does a TIOP reference code occur?

Note: This may take up to 5 minutes.

No Yes

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- ↓ Go to step 48 of this procedure.
46. Does a different reference code occur?
Yes No
↓ Ask your next level of support for assistance.
This ends the procedure.
47. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.
This ends the procedure.
48. Read the TIOP unit reference code (4 rightmost characters).
Does TIOP unit reference code 3100 occur (word 1 SRC 26xx 3100)?
No Yes
↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The System/370 interface cable (the one you disconnected from the cable string in step 44 of this procedure) is the failing item. Go to step 61 of this procedure.
49. Does TIOP reference code 3090 occur again?
No Yes
↓ Go to step 52 of this procedure.
50. Does a different reference code occur?
Yes No
↓ Ask your next level of support for assistance.
This ends the procedure.
51. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.
This ends the procedure.
52. You have isolated the problem to the TIOP adapter cable or the TIOP card.
Perform the following:
a. Power off the system.
b. Exchange the TIOP card (see “Chapter 4. Removal and Installation Procedures” on page 593).
c. Select IPL type D in manual mode.
d. Power on the system.
Does TIOP reference code 3090 still occur?
No Yes
↓ Go to step 56 of this procedure.
53. Does TIOP unit reference code 3100 occur?
No Yes
↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The failing item is the TIOP card, which you exchanged in step 52 of this procedure.
Perform the following:
a. Disconnect the channel wrap block from the end of the TIOP adapter cable.
b. Reconnect the TIOP adapter cable to the System/370 interface cable.

- c. Reconnect the System/370 interface cable to the I/O device control unit.
- d. Return to the procedure that sent you here.

This ends the procedure.

54. Does a different reference code occur?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

55. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

56. Exchange the TIOP adapter cable that is connected to the TIOP card.

57. Perform the following:

- a. Power off the system.
- b. Select IPL type D in manual mode.
- c. Power on the system.

Does TIOP reference code 3090 still occur?

No Yes

↓ Ask your next level of support for assistance.

This ends the procedure.

58. Does TIOP unit reference code 3100 occur?

No Yes

↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The failing item is the TIOP adapter cable, which you exchanged in step 56 of this procedure.

Perform the following:

- a. Reconnect the TIOP adapter cable to the System/370 interface cable.
- b. Reconnect the System/370 interface cable to the I/O device control unit.
- c. Return to the procedure that sent you here.

This ends the procedure.

59. Does a different reference code occur?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

60. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

61. Use Channel wrap block 1 and a multimeter to perform a continuity check on the System/370 interface cable. This procedure is used to find any open or short circuits.

62. Repair the cable if possible.

Does the open or short circuit condition in the cable still exist after you repaired it?

Tape IOP PIPs

Yes No

↓ Exchange the cable. Then go to step 64 of this procedure.

63. Connect the cables to their original locations (Bus to Bus and Tag to Tag).

64. Perform the following:

- a. Power off the system.
- b. Select IPL type D in manual mode.
- c. Power on the system.

Does the IPL complete successfully?

No Yes

↓ **This ends the procedure.**

65. Ask your next level of support for assistance.

This ends the procedure.

66. You are here because an internal channel cable connects TIOP to the 3490 Model Cxx.

The tape subsystem cables connect as shown in Figure 17.

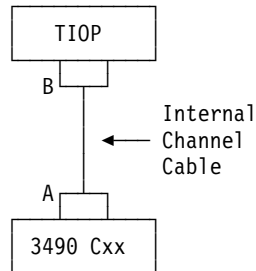


Figure 17. Tape Subsystem Cable Connections

Perform the following:

- a. Disconnect the internal channel cable from the I/O device control unit (at **A** in Figure 17).
- b. Connect channel wrap block 2, part 6473051, to the device end of the internal channel cable. The channel wrap block 2 is stored with the system tools.

67. Perform the following:

- a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
- b. Select IPL type D in manual mode (see *AS/400 Service Functions*).
- c. Power on the system.

Does a TIOP reference code occur?

Note: This may take up to 5 minutes.

No Yes

↓ Go to step 70 of this procedure.

68. Does a different reference code occur?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

69. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

70. Read the TIOP unit reference code (4 rightmost characters).

Does TIOP unit reference code 3100 occur (word 1 SRC 26xx 3100)?

No Yes

- ↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. You do not have to perform further analysis.

Perform the following:

- a. Disconnect the channel wrap block from the device end of the internal channel cable.
- b. Reconnect the cable to the I/O device control unit.
- c. Return to the procedure that sent you here.

This ends the procedure.

71. Does TIOP reference code 3090 occur?

No Yes

- ↓ Go to step 74 of this procedure.

72. Does a different reference code occur?

Yes No

- ↓ Ask your next level of support for assistance.

This ends the procedure.

73. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

74. The wrap test detected an internal channel cable failure or TIOP card failure.

Perform the following:

- a. Disconnect channel wrap block 2 from the end of the internal channel cable.
- b. Disconnect the internal channel cable from the TIOP card (at **B** in Figure 17 on page 480).
- c. Connect channel wrap block 2 to the TIOP card (at **B** in Figure 20 on page 492).

75. Perform the following:

- a. Power off the system.
- b. Select IPL type D in manual mode.
- c. Power on the system.

Does TIOP reference code 3090 occur again?

No Yes

- ↓ The failing item is the TIOP card.

Perform the following:

- a. Disconnect channel wrap block 2 from the TIOP card.
- b. Exchange the TIOP card (see “Chapter 4. Removal and Installation Procedures” on page 593).

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- c. Reconnect the internal channel cable to the TIOP card (at **B** in Figure 20 on page 492).
- d. Reconnect the internal channel cable to the I/O device control unit (at **A** in Figure 20 on page 492).
- e. Return to the procedure that sent you here.

This ends the procedure.

76. Does TIOP unit reference code 3100 occur?

No **Yes**

- ↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The failing item is the internal channel cable, which you disconnected from the TIOP card in step 74 of this procedure.

Perform the following:

- a. Disconnect channel wrap block 2 from the TIOP card.
- b. Exchange the internal channel cable.
- c. Return to the procedure that sent you here.

This ends the procedure.

77. Does a different reference code occur?

Yes **No**

- ↓ Ask your next level of support for assistance.

This ends the procedure.

78. Go to "Chapter 2. Unit Reference Codes" on page 17 to correct the problem.

This ends the procedure.

System/370 Interface Cable Wrap Test (5077)

This procedure determines if the tape I/O processor (TIOP) card or one of the cables that connects the TIOP to the tape device is failing. If a cable is failing, perform another analysis to find the failing signal lines. You may repair or exchange a failing cable.

Notes:

1. To perform this procedure, the tape unit must be the alternate IPL device.
2. To perform this procedure, you need one or both of the following:

- Channel wrap block 1 (part 62X3403)
- Channel wrap block 2 (part 6473051)

See "Channel Wrap Block 1" on page 891 and "Channel Wrap Block 2" on page 891.

These channel wrap blocks are stored with the system tools.

The tape subsystem configuration of the system determines the channel wrap blocks you need.

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

1. Is a 3490 Model Cxx Tape Unit connected to the system?

No **Yes**

↓ Go to step 27 of this procedure.

2. The tape subsystem cables are connected as shown in Figure 18.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

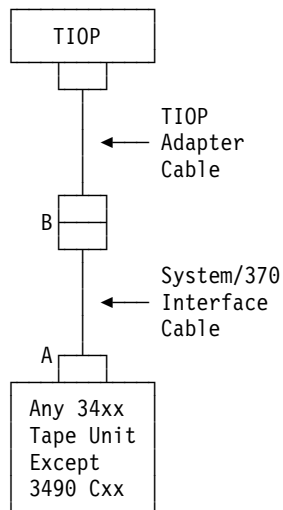


Figure 18. Tape Subsystem Cable Connections

Perform the following:

- a. Disconnect the System/370 interface cable from the I/O device control unit (at **A** in Figure 18).
 - b. Connect channel wrap block 1, part 62X3403, to the end of the System/370 interface cable (Bus to Bus and Tag to Tag). The channel wrap block 1 is stored with the system tools.
3. Perform the following:
 - a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Select IPL type D in manual mode (see *AS/400 Service Functions*).
 - c. Power on the system.

Does a TIOP reference code occur?

Note: This may take up to 5 minutes.

No **Yes**

↓ Go to step 6 of this procedure.

4. Does a different reference code occur?

Yes **No**

↓ Ask your next level of support for assistance.

This ends the procedure.

5. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

Tape IOP PIPs

This ends the procedure.

6. Read the TIOP unit reference code (4 rightmost characters).

Does TIOP unit reference code 3100 occur (word 1 SRC 26xx 3100)?

No **Yes**

↓ This is the normal reference code when the channel wrap block is connected and the cable string is not failing. The tape unit may be causing the problem.

Perform the following:

- a. Disconnect the channel wrap block from the device end of the System/370 interface cable.
- b. Reconnect the cable to the I/O device control unit.
- c. Return to the procedure that sent you here.

This ends the procedure.

7. Does TIOP reference code 3090 occur?

No **Yes**

↓ Go to step 10 of this procedure.

8. Does a different reference code occur?

Yes **No**

↓ Ask your next level of support for assistance.

This ends the procedure.

9. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

10. The wrap test detected a cable failure or TIOP card failure.

Perform the following:

- a. Disconnect channel wrap block 1 from the end of the System/370 interface cable.
- b. Disconnect the TIOP adapter cable from the System/370 interface cable (at **B** in Figure 18 on page 483).
- c. Connect channel wrap block 1 to the end of the TIOP adapter cable.

11. Perform the following:

- a. Power off the system.
- b. Select IPL type D in manual mode.
- c. Power on the system.

Does a TIOP reference code occur?

Note: This may take up to 5 minutes.

No **Yes**

↓ Go to step 14 of this procedure.

12. Does a different reference code occur?

Yes **No**

↓ Ask your next level of support for assistance.

This ends the procedure.

13. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

14. Read the TIOP unit reference code (4 rightmost characters).

Does TIOP unit reference code 3100 occur (word 1 SRC 26xx 3100)?

No Yes

↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The System/370 interface cable (the one you disconnected from the cable string in step 10 of this procedure) is the failing item. Go to step 61 of this procedure.

15. Does TIOP reference code 3090 occur again?

No Yes

↓ Go to step 18 of this procedure.

16. Does a different reference code occur?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

17. Go to "Chapter 2. Unit Reference Codes" on page 17 to correct the problem.

This ends the procedure.

18. You have isolated the problem to either the TIOP adapter cable or the TIOP card.

Perform the following:

- a. Power off the system.
- b. Exchange the TIOP card (see "Chapter 4. Removal and Installation Procedures" on page 593).
- c. Select IPL type D in manual mode.
- d. Power on the system.

Does TIOP reference code 3090 occur again?

No Yes

↓ Go to step 22 of this procedure.

19. Does TIOP unit reference code 3100 occur?

No Yes

↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The failing item is the TIOP card, which you exchanged in step 18 of this procedure.

Perform the following:

- a. Disconnect the channel wrap block from the end of the TIOP adapter cable.
- b. Reconnect the TIOP adapter cable to the System/370 interface cable.
- c. Reconnect the System/370 interface cable to the I/O device control unit.
- d. Return to the procedure that sent you here.

This ends the procedure.

20. Does a different reference code occur?

Yes No

Tape IOP PIPs

↓ Ask your next level of support for assistance.

This ends the procedure.

21. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

22. Perform the following:

a. Disconnect the channel wrap block from the end of the TIOP adapter cable.

b. Exchange the TIOP adapter cable that is connected to the TIOP card.

23. Perform the following:

a. Power off the system.

b. Select IPL type D in manual mode.

c. Power on the system.

Does TIOP reference code 3090 occur again?

No Yes

↓ Ask your next level of support for assistance.

This ends the procedure.

24. Does TIOP unit reference code 3100 occur?

No Yes

↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The failing item is the TIOP adapter cable, which you exchanged in step 22 of this procedure.

Perform the following:

a. Reconnect the TIOP adapter cable to the System/370 interface cable.

b. Reconnect the System/370 interface cable to the I/O device control unit.

c. Return to the procedure that sent you here.

This ends the procedure.

25. Does a different reference code occur?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

26. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

27. You are here because a 3490 Model Cxx is connected to the system.

Is a System/370 interface cable connected in the cable string between the TIOP and the 3490 Model Cxx?

Yes No

↓ Go to step 66 of this procedure.

28. The tape subsystem cables are connected as shown in Figure 19 on page 487.

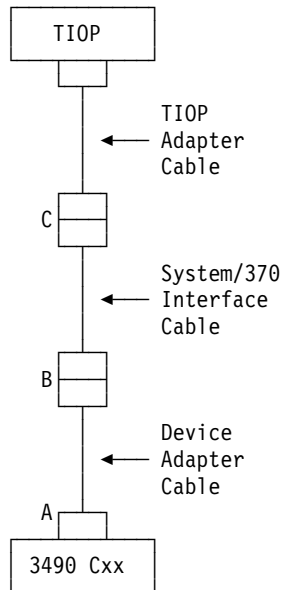


Figure 19. Tape Subsystem Cable Connections

Perform the following:

- a. Disconnect the device adapter cable from the I/O device control unit (at A in Figure 19).
 - b. Connect channel wrap block 2, part 6473051, to the device end of the device adapter cable. The channel wrap block is stored with the system tools.
29. Perform the following:
- a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
 - b. Select IPL type D in manual mode (see *AS/400 Service Functions*).
 - c. Power on the system.

Does a TIOP reference code occur?

Note: This may take up to 5 minutes.

No Yes

↓ Go to step 32 of this procedure.

30. Does a different reference code occur?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

31. Go to "Chapter 2. Unit Reference Codes" on page 17 to correct the problem.

This ends the procedure.

32. Read the TIOP unit reference code (4 rightmost characters).

Does TIOP unit reference code 3100 occur (word 1 SRC 26xx 3100)?

No Yes

Tape IOP PIPs

- ↓ This is the normal reference code when the channel wrap block is connected and the cable string is not failing. The tape unit may be causing the problem.

Perform the following:

- a. Disconnect the channel wrap block from the device end of the device adapter cable.
- b. Reconnect the cable to the I/O device control unit.
- c. Return to the procedure that sent you here.

This ends the procedure.

33. Does TIOP reference code 3090 occur?

No Yes

- ↓ Go to step 36 of this procedure.

34. Does a different reference code occur?

Yes No

- ↓ Ask your next level of support for assistance.

This ends the procedure.

35. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

36. The wrap test detected a cable failure or a TIOP card failure.

Perform the following:

- a. Disconnect channel wrap block 2 from the end of the device adapter cable.
- b. Disconnect the System/370 interface cable from the device adapter cable (at **B** in Figure 19 on page 487).
- c. Connect channel wrap block 1 (part 62X3403) to the end of the System/370 interface cable (Bus to Bus and Tag to Tag).

37. Perform the following:

- a. Power off the system.
- b. Select IPL type D in manual mode.
- c. Power on the system.

Does a TIOP reference code occur?

Note: This may take up to 5 minutes.

No Yes

- ↓ Go to step 40 of this procedure.

38. Does a different reference code occur?

Yes No

- ↓ Ask your next level of support for assistance.

This ends the procedure.

39. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

40. Read the TIOP unit reference code (4 rightmost characters).

Does TIOP unit reference code 3100 occur (word 1 SRC 26xx 3100)?

No Yes

- ↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The failing item is the device adapter cable, which you disconnected from the cable string in step 36 of this procedure.

Perform the following:

- a. Exchange the device adapter cable.
- b. Disconnect the channel wrap block from the end of the System/370 interface cable.
- c. Reconnect the System/370 interface cable to the device adapter cable.
- d. Reconnect the device adapter cable to the I/O device control unit.
- e. Return to the procedure that sent you here.

This ends the procedure.

41. Does TIOP reference code 3090 still occur?

No Yes

- ↓ Go to step 44 of this procedure.

42. Does a different reference code occur?

Yes No

- ↓ Ask your next level of support for assistance.

This ends the procedure.

43. Go to "Chapter 2. Unit Reference Codes" on page 17 to correct the problem.

This ends the procedure.

44. You have isolated the problem to one of the remaining cables or to the TIOP card.

Perform the following:

- a. Disconnect channel wrap block 1 from the end of the System/370 interface cable.
- b. Disconnect the TIOP adapter cable from the System/370 interface cable (at C in Figure 19 on page 487).
- c. Connect channel wrap block 1 to the end of the TIOP adapter cable (Bus to Bus and Tag to Tag).

45. Perform the following:

- a. Power off the system.
- b. Select IPL type D in manual mode.
- c. Power on the system.

Does a TIOP reference code occur?

Note: This may take up to 5 minutes.

No Yes

- ↓ Go to step 48 of this procedure.

46. Does a different reference code occur?

Yes No

- ↓ Ask your next level of support for assistance.

This ends the procedure.

Tape IOP PIPs

47. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.
This ends the procedure.
48. Read the TIOP unit reference code (4 rightmost characters).
Does TIOP unit reference code 3100 occur (word 1 SRC 26xx 3100)?
- No Yes**
- ↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The System/370 interface cable (the one you disconnected from the cable string in step 44 of this procedure) is the failing item. Go to step 61 of this procedure.
49. Does TIOP reference code 3090 occur again?
- No Yes**
- ↓ Go to step 52 of this procedure.
50. Does a different reference code occur?
- Yes No**
- ↓ Ask your next level of support for assistance.
This ends the procedure.
51. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.
This ends the procedure.
52. You have isolated the problem to the TIOP adapter cable or the TIOP card.
Perform the following:
- Power off the system.
 - Exchange the TIOP card (see “Chapter 4. Removal and Installation Procedures” on page 593).
 - Select IPL type D in manual mode.
 - Power on the system.
- Does TIOP reference code 3090 still occur?
- No Yes**
- ↓ Go to step 56 of this procedure.
53. Does TIOP unit reference code 3100 occur?
- No Yes**
- ↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The failing item is the TIOP card, which you exchanged in step 52 of this procedure.
- Perform the following:
- Disconnect the channel wrap block from the end of the TIOP adapter cable.
 - Reconnect the TIOP adapter cable to the System/370 interface cable.
 - Reconnect the System/370 interface cable to the I/O device control unit.
 - Return to the procedure that sent you here.
- This ends the procedure.**
54. Does a different reference code occur?
- Yes No**

↓ Ask your next level of support for assistance.

This ends the procedure.

55. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

56. Exchange the TIOP adapter cable that is connected to the TIOP card.

57. Perform the following:

- a. Power off the system.
- b. Select IPL type D in manual mode.
- c. Power on the system.

Does TIOP reference code 3090 still occur?

No Yes

↓ Ask your next level of support for assistance.

This ends the procedure.

58. Does TIOP unit reference code 3100 occur?

No Yes

↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The failing item is the TIOP adapter cable, which you exchanged in step 56 of this procedure.

Perform the following:

- a. Reconnect the TIOP adapter cable to the System/370 interface cable.
- b. Reconnect the System/370 interface cable to the I/O device control unit.
- c. Return to the procedure that sent you here.

This ends the procedure.

59. Does a different reference code occur?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

60. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

61. Use channel wrap block 1, and a multimeter to perform a continuity check on the System/370 interface cable. This check is used to find any open or short circuits.

62. Repair the cable if possible.

Does the open or short circuit condition in the cable still exist after you repaired it?

Yes No

↓ Exchange the cable. Then go to step 64 of this procedure.

63. Connect the cables to their original locations (Bus to Bus and Tag to Tag).

64. Perform the following:

- a. Power off the system.
- b. Select IPL type D in manual mode.

Tape IOP PIPs

c. Power on the system.

Does the IPL complete successfully?

No **Yes**

↓ **This ends the procedure.**

65. Ask your next level of support for assistance.

This ends the procedure.

66. You are here because an internal channel cable is connected between the TIOP and the 3490 Model Cxx.

The tape subsystem cables are connected as shown in Figure 20.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

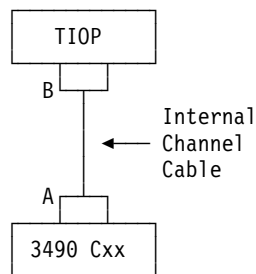


Figure 20. Tape Subsystem Cable Connections

Perform the following:

- a. Disconnect the internal channel cable from the I/O device control unit (at **A** in Figure 20).
- b. Connect channel wrap block 2, part 6473051, to the device end of the internal channel cable. The channel wrap block is stored with the system tools.

67. Perform the following:

- a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
- b. Select IPL type D in manual mode (see *AS/400 Service Functions*).
- c. Power on the system.

Does a TIOP reference code occur?

Note: This may take up to 5 minutes.

No **Yes**

↓ Go to step 70 of this procedure.

68. Does a different reference code occur?

Yes **No**

↓ Ask your next level of support for assistance.

This ends the procedure.

69. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

70. Read the TIOP unit reference code (4 rightmost characters).

Does TIOP unit reference code 3100 occur (word 1 SRC 26xx 3100)?

No Yes

↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. You do not need to perform further analysis.

Perform the following:

- a. Disconnect the channel wrap block from the device end of the internal channel cable.
- b. Reconnect the cable to the I/O device control unit.
- c. Return to the procedure that sent you here.

This ends the procedure.

71. Does TIOP reference code 3090 occur?

No Yes

↓ Go to step 74 of this procedure.

72. Does a different reference code occur?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

73. Go to “Chapter 2. Unit Reference Codes” on page 17 to correct the problem.

This ends the procedure.

74. The wrap test detected an internal channel cable failure or TIOP card failure.

Perform the following:

- a. Disconnect channel wrap block 2 from the end of the internal channel cable.
- b. Disconnect the internal channel cable from the TIOP card (at **B** in Figure 20 on page 492).
- c. Connect channel wrap block 2 to the TIOP card (at **B** in Figure 20 on page 492).

75. Perform the following:

- a. Power off the system.
- b. Select IPL type D in manual mode.
- c. Power on the system.

Does TIOP reference code 3090 occur again?

No Yes

↓ The failing item is the TIOP card.

Perform the following:

- a. Disconnect channel wrap block 2 from the TIOP card.
- b. Exchange the TIOP card (see “Chapter 4. Removal and Installation Procedures” on page 593).
- c. Reconnect the internal channel cable to the TIOP card (at **B** in Figure 20 on page 492).
- d. Reconnect the internal channel cable to the I/O device control unit (at **A** in Figure 20 on page 492).

Tape IOP PIPs

e. Return to the procedure that sent you here.

This ends the procedure.

76. Does TIOP unit reference code 3100 occur?

No Yes

↓ This is the normal code when the channel wrap block is connected and the cable string is not failing. The failing item is the internal channel cable, which you disconnected from the TIOP card in step 74 of this procedure.

Perform the following:

- a. Disconnect channel wrap block 2 from the TIOP card.
- b. Exchange the internal channel cable.
- c. Return to the procedure that sent you here.

This ends the procedure.

77. Does a different reference code occur?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

78. Go to "Chapter 2. Unit Reference Codes" on page 17 to correct the problem.

This ends the procedure.

Tape I/O Processor Failing Items

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Item Description

Tape I/O processor

Location Procedure

1. Read the address of the failing TIOP from the product activity log record or from the Problem Summary Form (see "Problem Summary Form Content (Example)" on page 496).
2. If needed, use the system configuration list with this address to physically find the TIOP card.

Bus and Tag terminating plugs

1. Read the address of the failing TIOP from the product activity log record or from the Problem Summary Form (see "Problem Summary Form Content (Example)" on page 496).
2. If needed, use the system configuration list with this address to physically find the I/O devices attached to the TIOP.
3. Find the control unit device attached to the interface cable. The Bus and Tag terminating plugs are in that control unit.

Item Description

Interface cables

Location Procedure

1. Read the address of the failing TIOP from the product activity log record or from the Problem Summary Form (see "Problem Summary Form Content (Example)" on page 496).
2. If needed, use the system configuration list with this address to physically find the I/O devices attached to the TIOP.
3. The interface cables connect the TIOP to the device control unit. The failing item number for FI00850 is in "Failing Items" on page 539.

Attached I/O devices

1. Read the address of the failing TIOP from the product activity log record or from the Problem Summary Form (see "Problem Summary Form Content (Example)" on page 496).
2. If needed, use the system configuration list with this address to physically find the I/O devices attached to the TIOP.

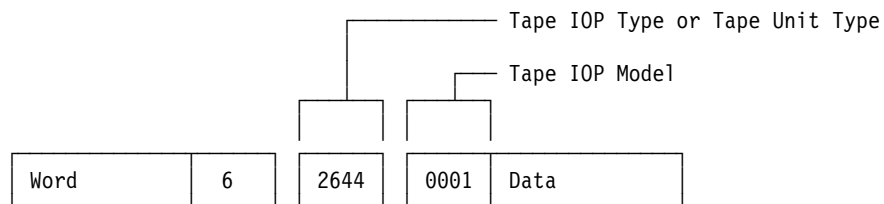
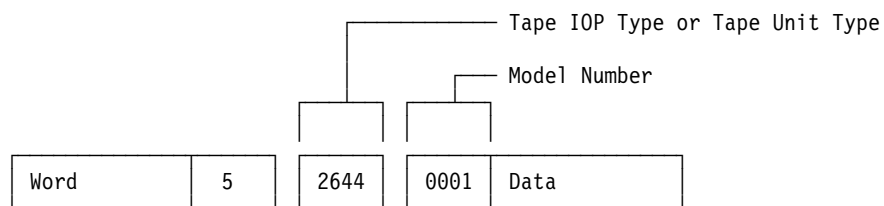
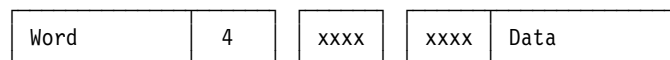
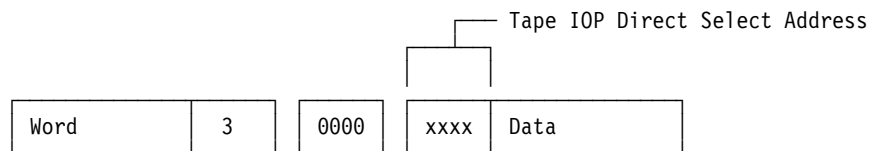
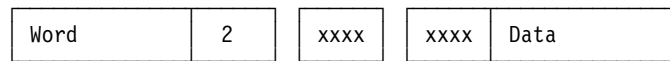
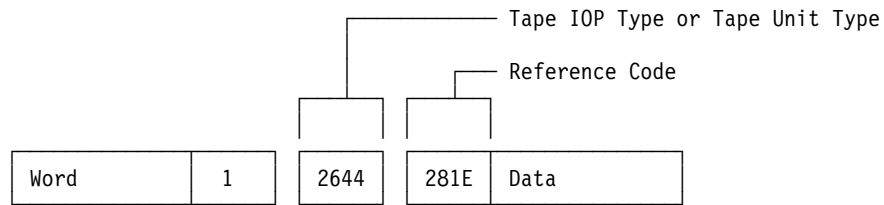
Note: Any one of the I/O devices attached to the TIOP may be the failing item.

Tape I/O processor card to cable adapter for the System/370 interface cable

1. Read the address of the failing TIOP from the product activity log record or from the Problem Summary Form (see "Problem Summary Form Content (Example)" on page 496).
2. Read the address of the failing I/O device from the product activity log record or from the Problem Summary Form.
3. If needed, use the system configuration list with this address to physically find the TIOP card.
4. The cable adapter connects the TIOP card to the System/370 interface cables.

Tape IOP PIPs

Problem Summary Form Content (Example)



To display device sense data (if available):

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, select these functions from the system control panel, they are not available from the *partition status* screen.

1. Select function 25 (Service Switch 1).
2. Select function 26 (Service Switch 2).
3. Select function 55.
4. Select function 5515.
5. Record the data that is displayed from function 5515 (first control unit error code).
6. Select function 5516.
7. Record the data that is displayed from function 5516 (second and third control unit error codes).

8. Select function 5518.
9. Record the data that is displayed from function 5518 (drive error codes).

Note: See “Expansion Tower Locations and Addresses” on page 687 for information on direct select address and unit address.

Tape Unit Problem Isolation Procedures

Overview

This section 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; this includes its electronic parts and status indicators
- An internal tape drive; this includes its tray, power regulator, and AMDs
- An external tape drive; this includes 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, this document uses the terms *tape drive* and *enclosure* to indicate a more specific meaning.

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 or Expansion Tower” on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

Read and understand the following service procedures before using this section:

- “Powering On and Powering Off the System or Expansion Tower” on page 868
- “Initial Program Load (IPL) Information” in the *AS/400 Service Functions* information

TU-PIP1

Introduction:

Tape Unit PIPs

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

This procedure isolates tape unit power problems.

Read the “Overview” on page 497 before continuing with this procedure.

1. Is the tape unit in an external enclosure, and does the tape unit enclosure have a Power switch?

Yes **No**

↓ Go to “TU-PIP3” on page 502.

This ends the procedure.

2. Is the tape unit powered on?

Yes **No**

↓ Go to step 10 of this procedure.

3. Press the Unload switch on the front of the tape unit.

Is a data cartridge or a tape reel present?

Yes **No**

↓ Go to step 5 of this procedure.

4. Attempt to remove the data cartridge or tape reel from the tape unit.

Can you remove the data cartridge or tape reel?

Yes **No**

↓ The tape unit is the failing part.

Go to “TU-PIP3” on page 502.

Note: If the tape unit is an 8-mm tape drive, perform the following:

- a. Go to “Tape Cartridge – Manual Removal (FC 507x/508x)” on page 674.
- b. Go to “TU-PIP3” on page 502.

This ends the procedure.

5. Is the tape unit installed in an FC 5032 Removable Storage Unit?

No **Yes**

↓ Go to “TU-PIP5” on page 510.

This ends the procedure.

6. Are you working on an 8-mm tape drive?

Yes **No**

↓ Go to step 8 of this procedure.

7. Is the system powered on?

Yes **No**

↓ The 8-mm tape drive cannot operate if the system is powered off and the external I/O signal cable is connected.

Perform the following:

- a. Disconnect the external I/O signal cable from the 8-mm tape drive.
- b. Continue with the next step of this procedure.

8. Is the tape unit Power light on?

Yes No

↓ Perform the following:

- a. Ensure that the power cable connects tightly to the power cable connector at the back of the tape unit.
- b. Ensure that the power cable connects to a power outlet that has the correct voltage.
- c. Go to step 10 of this procedure.

9. Set the tape unit Power switch to the Power Off position (see Table 26).

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Table 26. Power Off and Power On Positions of Tape Unit Power Switches

Operation	Power Switch Type	Toggle
		Push In/Out
Power Off	Down	Out
Power On	Up	In

10. Set the tape unit Power switch to the Power On position (see Table 26).

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 Yes

↓ Perform the following:

- a. Go to the service information for the specific tape device to correct the power problem.
- b. When you have corrected the power problem, go to “TU-PIP3” on page 502.

This ends the procedure.

11. The tape unit 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 Yes

↓ Go to “TU-PIP3” on page 502.

This ends the procedure.

12. Go to the service information for the specific tape device to correct the problem. Then go to “TU-PIP3” on page 502.

This ends the procedure.

Tape Unit PIPs

TU-PIP2

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

This procedure performs the 8-mm tape drive read self-test and hardware self-test. The write test is performed in “TU-PIP3” on page 502.

Read the “Overview” on page 497 before continuing with this procedure.

1. Press the Unload switch on the front of the 8-mm tape drive.

Is a data cartridge present?

Yes **No**

↓ Go to step 3 of this procedure.

2. Attempt to remove the data cartridge.

Can you remove the data cartridge?

Yes **No**

↓ The tape drive is the failing part.

Go to “Tape Cartridge – Manual Removal (FC 507x/508x)” on page 674. After removing the data cartridge, exchange the tape drive (see Removable Media in “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

3. Clean the tape drive by using the cleaning cartridge (part 16G8467).

Note: 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 **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 8-mm tape drive.

Go to “TU-PIP3” on page 502.

This ends the procedure.

4. Is the Disturbance light blinking?

No **Yes**

↓

- If the 8-mm tape drive is a type 6390, the possible failing part is the 6390 Tape Drive.

- If the 8-mm tape drive is a type 7208, the possible failing parts are:
 - a. 7208 Tape Drive
 - b. Power supply
 - c. AMD

Go to “TU-PIP3” on page 502.

This ends the procedure.

5. The 8-mm tape drive read self-test and hardware self-test can take up to 5 minutes to run.

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 Yes

↓ Go to step 9 of this procedure.

6. Does the tape drive eject the diagnostic cartridge?

Yes No

↓ The tape drive is the failing part.

Go to “Tape Cartridge – Manual Removal (FC 507x/508x)” on page 674. After removing the diagnostic cartridge, exchange the tape drive (see Removable Media in “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

7. Is the Disturbance light blinking approximately four times per second?

No 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 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 8-mm tape drive.

Go to “TU-PIP3” on page 502.

This ends the procedure.

8. The Disturbance light is blinking approximately once per second.
 - If the 8-mm tape drive is a type 6390, the possible failing part is the 6390 Tape Drive.
 - If the 8-mm tape drive is a type 7208, the possible failing parts are:
 - a. 7208 Tape Drive
 - b. Power supply

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c. AMD

Go to "TU-PIP3".

This ends the procedure.

9. 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 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 8-mm tape drive is a type 6390, the possible failing part is the 6390 Tape Drive.
- If the 8-mm tape drive is a type 7208, the possible failing parts are:
 - a. 7208 Tape Drive
 - b. Power supply
 - c. AMD

Go to "TU-PIP3".

This ends the procedure.

10. The read self-test and hardware self-test ended successfully.
Was the user's original tape identified as the probable cause of failure?

Yes No

↓ Go to "TU-PIP3".

This ends the procedure.

11. 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 "TU-PIP3".

This ends the procedure.

TU-PIP3

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

When you are directed to this procedure, you may need to exchange a failing part. You determined the failing part 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: Sometimes, the AS/400 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.

Read the “Overview” on page 497 before continuing with this procedure.

1. Do you need to exchange a possible failing device?

No **Yes**

↓ Perform the following:

For an internal tape unit, go to Removable Media “Chapter 4. Removal and Installation Procedures” on page 593.

For an external tape unit, go to the removal and installation procedures in the device service information.

2. Do you need to exchange the tape unit I/O processor?

No **Yes**

↓ Exchange the tape unit I/O processor (see “Chapter 4. Removal and Installation Procedures” on page 593). When you have completed the removal and installation procedure, continue with the next step of this procedure.

3. Are you working with a tape unit in the system unit or in an expansion unit?

Yes **No**

↓ Go to step 5 of this procedure.

4. Is the system available, and can you enter commands on the command line?

No **Yes**

↓ Go to step 12 of this procedure.

5. Display the selected IPL type (see *AS/400 Service Functions*).

Is the displayed IPL type D?

No **Yes**

↓ Go to step 8 of this procedure.

6. Do you want to perform an alternate IPL (type D)?

No **Yes**

↓ Go to step 8 of this procedure.

7. Perform an IPL from disk by doing the following:

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- a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
 - b. Select IPL type A in manual mode.
 - c. Power on the system.
 - d. Go to step 10 of this procedure.
8. Place the first tape of the latest set of SAVSYS tapes or SAVSTG tapes, or the first IBM Software Distribution tape in the alternate IPL tape drive. The tape drive automatically becomes ready for the IPL operation (this may take several minutes).

Note: Do not use the Model-Unique Licensed Internal Code tape.

9. 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.
10. The IPL may take one or more hours to complete.
Does an unexpected SRC appear on the control panel, and is the System Attention light on?
- No Yes**
- ↓ Go to step 13 of this procedure.
11. Does the IPL complete successfully?
- Yes No**
- ↓ Go to "Starting Point For All Problems" on page 3 to continue analyzing the problem.

This ends the procedure.

12. 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 Yes

↓ **This ends the procedure.**

13. Record the SRC on the Problem Summary Form (see "Appendix A. Problem Summary Form" on page 895).

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

Yes No

↓ A different SRC occurred. Use the new SRC to correct the problem (see "Chapter 2. Unit Reference Codes" on page 17).

This ends the procedure.

14. 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.

TU-PIP4

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Use this procedure to reset an IOP and its attached tape units.

Note: If disk units are attached to an IOP, you must power off the system, then power it on to reset the IOP.

1. Is the tape unit powered on?

No **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.

2. 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 8-mm 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.

3. Did you press the Unload switch in step 1 of this procedure?

Yes **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.

4. Can you enter commands on the command line?

Yes **No**

↓ Go to step 12 of this procedure.

5. Has the tape unit operated correctly since it was installed?

Note: If you do not know, continue with the next step of this procedure.

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Yes **No**

↓ Go to step 12 of this procedure.

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 step 7 of this procedure. You may continue without a name.

Does the I/O processor give support to only one tape unit?

Note: If you do not know, continue with the next step of this procedure.

No **Yes**

↓ Perform the following:

- a. Enter

```
WRKCFGSTS *DEV *TAP ASTLVL(*INTERMED)
```

(the Work with Configuration Status command) on the command line.

- b. You must complete all parts of this step before you press the Enter key.

Note: If the device is not varied off, select the *Vary off* option before continuing.

- c. Select the *Vary on* option for the failing tape unit.

- d. Enter

```
RESET(*YES)
```

(the Reset command) on the command line.

- e. Press the Enter key.

This ends the procedure.

7. Steps 7 and 8 of this procedure determine 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 12 of this procedure.
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 of this procedure?

No **Yes**

↓ Perform the following:

- a. Select the *Work with resources* option 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. Go to step 9 of this procedure.
8. Perform the following:
- Select the *Work with resources* option for each storage resource IOP (CMB01, SIO1, and SIO2 are examples of storage resource IOPs).
 - Find the Configuration Description name of the tape unit you are attempting to use. Record the Configuration Description names of all tape units that the I/O processor gives support to.
 - Record whether the I/O processor for the tape unit also gives support to any disk unit resources.
9. Does the I/O processor give support to any disk unit resources?
- No Yes**
- ↓ The *Reset* option is not available. Go to step 12 of this procedure.
10. Does the I/O processor give support to only one tape unit?
- No Yes**
- ↓ Perform the following:
- Select the *Work with configuration description* option and press the Enter key.
 - Select the *Work with status* option and press the Enter key.
 - You must complete the remaining parts of this step before you press the Enter key.
- Note:** If the device is not varied off, select the *Vary off* option before continuing.
- Select the *Vary on* option for the failing tape unit.
 - Enter
RESET(*YES)
- (the Reset command) on the command line.
- Press the Enter key.
- This ends the procedure.**
11. Perform the following:
- Enter
WRKCFGSTS *DEV *TAP ASTLVL(*INTERMED)
- (the Work with Configuration Status command) on the command line.
- Select the *Vary off* option for the failing tape unit and associated devices (the devices you identified in step 7 or 8 of this procedure). Press the Enter key.
 - You must complete the remaining parts of this step before you press the Enter key.
 - Select the *Vary on* option for the failing tape unit.
 - Enter
RESET(*YES)
- (the Reset command) on the command line.
- Press the Enter key.

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- g. Select the *Vary on* option for the associated devices (tape units) you identified in step 7 or 8 of this procedure. It is not necessary to use the *Reset* option again.

Does a system message indicate that the vary on operation failed?

Yes **No**

↓ **This ends the procedure.**

12. The *Reset* option 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.

13. Is the tape device you are working on an 8-mm tape drive?

Yes **No**

↓ Go to step 15 of this procedure.

14. Verify the following on the 8-mm 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 8-mm tape drive. The 8-mm tape drive does not need and must not have an external terminating plug.

Is the 8-mm tape drive Power light on, and is the Disturbance light off?

Yes **No**

↓ Go to "TU-PIP2" on page 500 to correct the problem.

This ends the procedure.

15. Is a data cartridge or a tape reel installed in the tape device?

No **Yes**

↓ Remove the data cartridge or tape reel. Then continue with the next step of this procedure.

16. Can you enter commands on the command line?

Yes **No**

↓ Perform the following:

- a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
- b. Power on the system.

The system performs an IPL and resets all devices. If the tape device responds to SCSI address 7, the AS/400 system configures the tape device.

This ends the procedure.

17. Verify that automatic configuration is On by entering
DPSYSVAL QAUTOCFG

(the Display System Value command) on the command line.

Is the *Autoconfigure device* option set to 1?

Yes **No**

↓ Perform the following:

- a. Press the Enter key 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 23 of this procedure,

- c. Continue with the next step of this procedure.

18. Perform the following:

- a. Enter
STRSST

(the Start SST command) on the command line.

- b. Select the *Start a Service Tool* option.
- c. Select the *Hardware Service Manager* option.
- d. Select the *Logical Hardware Resources* option.
- e. Select the *System Bus Resources* option.

The Logical Hardware Resources on System Bus display shows all of the IOPs.

- f. Find the IOP you want to reset.

Note: 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 **Yes**

↓ Disk units are attached to the IOP.

Perform the following:

- a. Press F3 until the Exit System Service Tools display appears.
- b. Press the Enter key.
- c. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
- d. Power on the system.

The system performs an IPL and resets all devices.

This ends the procedure.

19. Perform the following:

- a. Select the *I/O debug* option.

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- b. Select the *IPL the I/O processor* option.
 - c. When the IOP reset is complete, continue with the next step of this procedure.
20. Perform the following:
- a. Press F12 to return to the Logical Hardware Resources on System Bus display.
 - b. Select the *Resources associated with IOP* option for the IOP you reset.

Did the IOP detect the tape unit?

Yes **No**

↓ The IOP did not detect the tape unit.

Ensure that the tape unit is powered on and that the signal cables are connected correctly. If you find and correct a power problem or a signal cable problem, return to step 18 of this procedure.

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 18 of this procedure.

If not, ask your next level of support for assistance.

This ends the procedure.

21. Press F3 until the Exit System Service Tools display appears. Then press the Enter key.
22. Was automatic configuration Off before you performed step 17 of this procedure?

Yes **No**

↓ **This ends the procedure.**

23. Enter

```
CHGSYSVAL QAUTOCFG '0'
```

(the Change System Value command) on the command line to reset QAUTOCFG to its initial value.

This ends the procedure.

TU-PIP5

Introduction: This procedure isolates Field Replacable Units when the failing tape unit is installed in the FC 5032 Removable Storage Unit and is being used for an alternate IPL operation. For this operation, install the failing tape unit in position 1 or 3 of the FC 5032 Removable Storage Unit.

Note: The DSE module (differential to single-ended module) internal to the FC 5032 Removable Storage Unit terminates each external signal cable. No terminating plug is required. The DSE module converts two external differential signal I/O buses to four internal tape unit single-ended (SE) I/O buses. The DSE module connects Tape units as follows:

- Tape units in the top 5032 locations (positions 1 and 2) use the top external cable connector.
- Tape units in the bottom 5032 locations (positions 3 and 4) use the bottom external cable connector.

Each 1/4-inch tape unit has a terminating plug that terminates the internal single-ended I/O bus.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 497 before continuing with this procedure.

1. Is the Power On switch on the FC 5032 Removable Storage Unit set to the Power On position?

Yes No

- ↓ Set the Power On switch on the FC 5032 Removable Storage Unit to the Power On position.

This ends the procedure.

2. Is a data cartridge installed in the tape unit?

No Yes

- ↓ Remove the data cartridge. Then continue with the next step of this procedure.

3. Is the Power On light (green) on the front of the FC 5032 Removable Storage Unit on?

No Yes

- ↓ Go to step 7 of this procedure.

4. Perform the following:

- a. Set the Power On switch on the FC 5032 Removable Storage Unit to the Power Off position.
- b. Ensure that the tape unit power cable is connected correctly at the back of the tape unit and at the frame power control compartment (PCC).
- c. Ensure that the PCC circuit breaker for the tape unit power cable is set to the I (on) position.
- d. Set the Power On switch on the FC 5032 Removable Storage Unit to the Power On position.

5. Look at the display on the FC 5032 Removable Storage Unit control panel.

The display may be blank, or it may have system power control network (SPCN) status codes in the following form:

- 1RRN rrrr - Power fault (where RR is the frame number, N is the port number, and rrrr is a SPCN reference code)

If this is the case, return to the Starting point for all problems in the system book that sent you here (either *AS/400e server 270, and 820 Problem Analysis, Repair and Parts* or *AS/400e server 830, 840, SB2, and SB3 Problem Analysis, Repair and Parts*) and work the SPCN SRC.

This ends the procedure.

6. Is the Power On light (green) on the front of the FC 5032 Removable Storage Unit on?

Yes No

Tape Unit PIPs

↓ Go to “Starting Point For All Problems” on page 3 to correct the problem.

This ends the procedure.

7. Is the tape indicator light on the front of the tape unit on?

No Yes

↓ The tape unit is failing. Exchange this tape unit (see Removable Media in “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

8. Insert the test data cartridge into the failing tape unit.

Does the tape indicator light (green) on the front of the tape unit go on for approximately 1 minute, then go off?

No Yes

↓ This tape unit is not failing.

If this is your first time through this procedure, go to step 13 of this procedure.

If this is your second time through this procedure, go to step 11 of this procedure.

If this is your third time through this procedure, go to step 12 of this procedure.

9. Perform the following:

a. Set the Power On switch on the FC 5032 Removable Storage Unit to the Power Off position.

b. Reseat the following:

- The tray for the failing tape unit
- The external signal cable at the FC 5032 Removable Storage Unit and at the I/O processor.

c. Set the Power On switch on the FC 5032 Removable Storage Unit to the Power On position.

Does the tape indicator light (green) on the front of the tape unit go on for approximately 1 minute, then go off?

No Yes

↓ You corrected the problem by reseating the items in this step.

This ends the procedure.

10. Insert a test data cartridge (part 21F8586) into the tape unit to the right of the tape unit you are using.

Note: A tape unit to the right of the tape unit being used may be causing the failure. The signal control lines from the left and right tape units are common at the FC 5032 DSE module internal I/O bus. A tape unit above or below the tape unit being used is *not* a probable cause of failure. (It is attached to a different internal DSE I/O bus.)

Does the tape indicator light (green) on the front of the tape unit to the right go on for approximately 1 minute, then go off?

Yes No

↓ Go to step 12 of this procedure.

11. Exchange the following field replaceable units one at a time until you have corrected the problem:
 - a. Failing tape unit - 96%
 - b. External signal cable - 1%
 - c. DSE module - 1%
 - d. If a tape unit is installed to the right of the tape unit in use, exchange that tape unit - 1%
 - e. Cable carrier - 1%

Note: After exchanging each field replaceable unit, perform the following:

- a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
- b. Select IPL type D in manual mode (see *AS/400 Service Functions*).
- c. Power on the system.
- d. Select the first tape of the latest set of SAVSYS tapes, SAVSTG tapes, or the first IBM Software Distribution tape. Place it in the tape unit that is located in the system unit. The tape unit automatically becomes ready for the IPL operation (this may take several minutes).

This ends the procedure.

12. Exchange the following field replaceable units one at a time until you have corrected the problem:
 - a. I/O processor - 91%
 - b. DSE module - 4%
 - c. Cable carrier - 4%
 - d. External signal cable - 1%

Note: After exchanging each field replaceable unit, perform the following:

- a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
- b. Select IPL type D in manual mode (see *AS/400 Service Functions*).
- c. Power on the system.
- d. Select the first tape of the latest set of SAVSYS tapes, SAVSTG tapes, or the first IBM Software Distribution tape. Place it in the tape unit that is located in the system unit. The tape unit automatically becomes ready for the IPL operation (this may take several minutes).

This ends the procedure.

13. Perform the following:
 - a. Remove the test data cartridge from the tape unit.
 - b. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
 - c. Select IPL type D in manual mode (see *AS/400 Service Functions*).
 - d. Select the first tape of the latest set of SAVSYS tapes, SAVSTG tapes, or the first IBM Software Distribution tape. Place it in the tape unit that is located in the system unit. The tape unit automatically becomes ready for the IPL operation (this may take several minutes).

Note: Do not use the Model-Unique Licensed Internal Code tape.

Tape Unit PIPs

e. Power on the system.

This ends the procedure.

TU-PIP6

Introduction: This procedure isolates 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.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 497 before continuing with this procedure.

1. Is the device that you are using for alternate installation defined as the alternate installation device?

Yes No

↓ Correct the alternate installation device information and retry the alternate installation.

This ends the procedure.

2. Is the alternate installation device ready?

Yes No

↓ Make the alternate installation device ready and retry the alternate installation.

This ends the procedure.

3. Is there installation media in the alternate installation device?

Yes No

↓ Load the correct media and retry the alternate installation.

This ends the procedure.

4. Is the alternate installation device an external device?

Yes No

↓ Go to 11 of this procedure.

5. Is the alternate installation device powered on?

Yes No

↓ Go to step 8 of this procedure.

6. 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 **No**

↓ Correct the problem and retry the alternate installation.

This ends the procedure.

7. Go to step 11 of this procedure.

8. 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 **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.

9. 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 **Yes**

↓ Retry the alternate installation.

This ends the procedure.

10. Go to the service information for the specific alternate installation device to correct the problem. Then retry the alternate installation.

This ends the procedure.

11. Was a device error recorded in the Product Activity Log?

No **Yes**

↓ See "Chapter 2. Unit Reference Codes" on page 17 to correct the problem.

This ends the procedure.

12. Contact your next level of support.

Tape Device Ready Conditions

Introduction:

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Tape Unit PIPs

All the conditions that are listed for the device must be correct for the device to be ready.

Note: If the device is not ready, use the *Action* column or other instructions and go to the service information for the specific tape device.

Table 27. Tape Device Ready Conditions

Storage Device	Ready Description	Action
2440	<ul style="list-style-type: none"> • Power switch is set to the On position. • Power light is on. • Tape is loaded. • Status display shows A 0. • Online light is on. 	See the <i>IBM 2440 Magnetic Tape Subsystem Operator's Manual G571-0149</i> , for instructions on making the tape unit ready. If you cannot make the tape unit ready, go to the "MAPs" section of the <i>IBM 2440 Magnetic Tape Subsystem Service Guide , G571-0166</i> .
3422/3430	<ul style="list-style-type: none"> • Power switch is set to the On position. • Power light is on. • Enable/Disable switch is set to the Enable position. • Tape is loaded. • Ready light is on. 	See the <i>3422 Magnetic Tape Subsystem Operator's Guide , SA32-0090</i> , or <i>3430 Magnetic Tape Subsystem Operator's Guide , SA32-0079</i> , for instructions on making the tape unit ready.
3480/3490	<ul style="list-style-type: none"> • Power switch is set to the On position. • Power light is on. • DC Power light is on. • Control unit Online switch is set to the Online position. • Control unit Normal/Test switch is set to the Normal position. • Control unit channel Enable/Disable switch is set to the Enable position. • Tape unit Online/Offline switch is set to the Online position. • Tape is loaded. • Tape unit displays Ready U or Ready F. 	See the <i>3480 Magnetic Tape Subsystem Operator's Guide , SA32-0066</i> , or <i>3490 Magnetic Tape Subsystem Operator's Guide , SA32-0124</i> , for instructions on making the tape unit ready.

Table 27. Tape Device Ready Conditions (continued)

Storage Device	Ready Description	Action
7208	<ul style="list-style-type: none"> • Power switch is on (pressed). • Power light is on. • Data cartridge is inserted. • Ready light is on. • System external signal cable is connected to the type 2621 I/O processor and to the 7208 Tape Drive. <p>Note: 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 "TU-PIP2" on page 500.
9348	<ul style="list-style-type: none"> • Power switch is set to the On position. • Power light is on. • Tape is loaded. • Status display shows 00 A002. • Online light is on. 	See the <i>9348 Customer Information manual, SA21-9567</i> , 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, SY31-0697</i> .

Twinaxial Workstation I/O Processor Problem Isolation Procedures

This section contains the procedures to isolate a failure which has been detected by the twinaxial workstation I/O processor.

Note: If you are using a personal computer, an emulation program must be installed and working.

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 or Expansion Tower" on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

To prevent a possible electrical shock when adding or removing any devices to or from the system, ensure that the power cords for those devices are unplugged before the signal cables are connected or disconnected. If possible, disconnect all power cords from the existing system before you add or remove a device. (RSFTD203)

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DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent a possible electrical shock, do not use the port tester during electrical storms. (RSFTD006)

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

Attention: When instructed, remove and connect cables carefully. You may damage the connectors if you use too much force.

Read and understand the following service procedures before using this section:

- “Powering On and Powering Off the System or Expansion Tower” on page 868
- “Determining a Primary or Alternative Console” in the *AS/400 Service Functions* information

TWSC-PIP1 (503x)

Introduction: The workstation IOP detected an error. 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.

Note: If you are using a Remote Operations Console, use “Operations Console-PIP1” on page 412 before using this procedure.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

1. Are you using a workstation adapter console?

Note: A personal computer (used as a console) that is attached to the AS/400 system by using a console cable feature is known as a workstation adapter console. The cable (part number 46G0450, 46G0479, or 44H7504) connects the serial port on the personal computer to a communications I/O adapter on the AS/400 system.

No Yes

↓ Go to “WSAC-PIP1” on page 537.

This ends the procedure.

2. Is the device you are attempting to repair a personal computer (PC)?

No Yes

↓ PC emulation programs operate and report system-to-PC communications problems differently. See the PC emulation information for details on error identification.

Go to step 3 of this procedure.

3. Perform the following:

- 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” in the *AS/400 Service Functions* information.
- 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).

Note: The cursor position can assist in problem analysis.

- The cursor in the upper left corner indicates a communication problem between the workstation IOP and the operating system. Perform the following to assist in problem analysis:
 - Verify that all current PTFs are loaded.
 - Ask your next level of support for assistance.
- The cursor in the upper right corner indicates a communication problem between the workstation IOP and the device.
 - Continue to the next step of this procedure to analyze the problem.

4. Is the system powered off?

Yes No

↓ Go to step 7 on page 520 of this procedure.

5. Perform the following:

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- a. Power on the system in Manual mode (see *AS/400 Service Functions*).
- 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 **Yes**

↓ If you disconnected any devices after the console in step 3 on page 519 of this procedure, 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 8 on page 521 of this procedure.
- 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.

6. Does the same reference code that sent you to this procedure appear on the control panel?

Yes **No**

↓ Go to "Starting Point For All Problems" on page 3 for this new problem.

This ends the procedure.

7. Perform the following to make DST available:
 - a. Ensure that Manual mode on the control panel is selected (see *AS/400 Service Functions*).
 - 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 **Yes**

↓ If you disconnected any devices after the console in step 3 on page 519 of this procedure, 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, go to step 8 on page 521 of this procedure.
- e. If no reference code appears, repeat steps a through d of this step until you have checked all devices disconnected previously.

Continue to perform the initial program load (IPL).

This ends the procedure.

8. 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 No

↓ Go to step 11 of this procedure.

9. 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?

No Yes

↓ Continue to perform the IPL.

This ends the procedure.

10. Does the same reference code appear on the control panel?

Yes No

↓ Go to "Starting Point For All Problems" on page 3 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 Yes

↓ Go to step 15 on page 522 of this procedure.

12. Does the system have an alternative console on a second workstation IOP?

Yes No

↓ Go to step 14 on page 522 of this procedure.

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

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- c. Cables
- d. Workstation IOA for the console
- e. Tower Card (see “FC 5033, FC 5034, and FC 5035 Tower Card” on page 597.)

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:

- 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.
- If you have another working display, you can exchange the console 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. Workstation IOA
 - c. Tower Card (see “FC 5033, FC 5034, and FC 5035 Tower Card” on page 597)
 - d. 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?

No Yes

↓ Go to step 18 of this procedure.

16. Check or exchange the cables from the system to the failing display.

Did this correct the problem?

Yes No

↓ Go to step 12 on page 521 of this procedure.

17. You corrected the problem.

This ends the procedure.

18. **DANGER**

To prevent a possible electrical shock, do not use the port tester during electrical storms. (RSFTD006)

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.
19. Find the input cable to the failing console or port.
Is the failing console or the failing port attached to a protocol converter?
- | No | Yes |
|----|--|
| ↓ | <p>Perform the following:</p> <ul style="list-style-type: none"> a. Disconnect the cable that comes from the system at the protocol converter. b. Connect the port tester to the cable. c. Go to step 21 of this procedure. |
20. Perform the following:
- a. Disconnect the input cable from the failing console.
 - b. Connect the port tester to the input cable.
21. 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.
Press and hold the test switch on the port tester for 15 seconds and observe the lights.
- If the port tester has three lights, do the following:**
- If only the top (green) light is on, go to step 31 on page 525 of this procedure.
 - If both the top (green) and center (yellow) lights are on, go to step 23 of this procedure.
- 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 24 on page 524 of this procedure.
 - If all lights are off, go to step 25 on page 524 of this procedure.
 - If all lights are on, go to step 22 of this procedure.
- If the port tester has two lights, do the following:**
- If only the top (green) light is on, go to step 31 on page 525 of this procedure.
 - If only the bottom (yellow) light is on, go to step 24 on page 524 of this procedure.
 - If both lights are off, go to step 25 on page 524 of this procedure.
 - If both lights are on, continue with the next step of this procedure.
22. 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 21 of this procedure.
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 18 on page 522 of this procedure.
23. 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 *Port Tester Use* information.

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This ends the procedure.

24. The cable network is bad. The wires in the cable between the console and the twinaxial workstation attachment are reversed. Go to step 30 of this procedure.
25. 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.
26. Press and hold the test switch on the port tester for 15 seconds and observe the lights.

If the port tester has three lights, do the following:

- If both the top (green) and center (yellow) lights are on, continue with step 27 of this procedure.

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 27 of this procedure.
- If all lights are off, continue with step 27 of this procedure.
- If only the top (green) light is on, go to step 29 of this procedure.
- If all lights are on, go to step 28 of this procedure.

If the port tester has two lights, do the following:

- If only the top (green) light is on, go to step 29 of this procedure.
- If only the bottom (yellow) light is on, continue with step 27 of this procedure.
- If both lights are off, continue with step 27 of this procedure.
- If both lights are on, go to step 28 of this procedure.

27. 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) Tower Card (see "FC 5033, FC 5034, and FC 5035 Tower Card" on page 597)
 - b. Power on the system to perform an IPL.

This ends the procedure.

28. 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 26 of this procedure. 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 25 of this procedure.
29. The cable to the workstation is the failing item. Continue with the next step of this procedure.
30. Cable maintenance is a customer responsibility. See the information that is listed below for more information on correcting cable problems.

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- If the IBM cable system is being used to attach the workstation, see the following information:
 - *IBM Cabling System Planning and Installation Guide*, GA27-3361
 - *Using the IBM Cabling System with Communication Products*, GA27-3620
 - *IBM Cabling System Problem Determination Guide for Twinaxial Applications*, GA21-9491
- If the telephone twisted-pair cable is being used to attach the console, see:
 - *IBM 5299 Model 3 Terminal Multiconnector and IBM Twinaxial to Twisted-pair Adapter Planning, Installation, and Problem Analysis Guide*, GA27-3749
- If a twinaxial cable is being used to attach the console, see:
 - *IBM 5250 Information Display System Planning and Site Preparation Guide*, GA21-9337
 - *Twinaxial Cabling Troubleshooting Guide*, SY31-0703
- If a link protocol converter is being used to attach the console, see the link protocol converter service information for problem analysis.
- The cable must be repaired or exchanged.

Then power on the system to perform an IPL.

This ends the procedure.

31. 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.
 - 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.
 - Exchange the following parts:
 - a. Console
 - b. Twinaxial workstation IOA
 - c. Tower Card (see “FC 5033, FC 5034, and FC 5035 Tower Card” on page 597)
 - d. Cables
 - 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.
 - 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 “LIC-PIP3 (5077)” on page 326.
 - The problem may be caused by devices that are attached after the console on port 0.

This ends the procedure.

TWSC-PIP1 (5077)

The workstation IOP detected an error. 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.

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- The Remote Operations Console is not working.

Note: If you are using a Remote Operations Console, use “Operations Console-PIP1” on page 412 before using this procedure.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

1. Are you using a workstation adapter console?

Note: A personal computer (used as a console) that is attached to the AS/400 system using a console cable feature is known as a workstation adapter console. The cable (P/N 46G0450, 46G0479, or 44H7504) connects the serial port on the personal computer to a communications I/O adapter on the AS/400 system.

No Yes

↓ Go to “WSAC-PIP1” on page 537.

This ends the procedure.

2. Is the device you are attempting to repair a personal computer (PC)?

No Yes

↓ PC emulation programs operate and report system-to-PC communications problems differently. See the PC emulation information for details on error identification.

Go to step 3 of this procedure.

3. Perform the following:

- 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” in the *AS/400 Service Functions* information.
- 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).

Note: The cursor position can assist in problem analysis.

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- The cursor in the upper left corner indicates a communication problem between the workstation IOP and the operating system. Perform the following to assist in problem analysis:
 - Verify that all current PTFs are loaded.
 - Ask your next level of support for assistance.
 - The cursor in the upper right corner indicates a communication problem between the workstation IOP and the device.
 - Continue to the next step of this procedure to analyze the problem.
4. Is the system powered off?
- Yes No**
- ↓ Go to step 7 of this procedure.
5. Perform the following:
- a. Power on the system in Manual mode (see *AS/400 Service Functions*).
 - 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 Yes

- ↓ If you disconnected any devices after the console in step 3 of this procedure, 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 8 of this procedure.
- 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.

6. Does the same reference code that sent you to this procedure appear on the control panel?

Yes No

- ↓ Go to “Starting Point For All Problems” on page 3 for this new problem.

This ends the procedure.

7. Perform the following to make DST available:
- a. Ensure that Manual mode on the control panel is selected (see *AS/400 Service Functions*).
 - 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 Yes

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↓ If you disconnected any devices after the console in step 3 of this procedure, 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, go to step 8 of this procedure.
- e. If no reference code appears, repeat steps a through d of this step until you have checked all devices disconnected previously.

Continue to perform the initial program load (IPL).

This ends the procedure.

8. 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 **No**

↓ Go to step 11 of this procedure.

9. 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?

No **Yes**

↓ Continue to perform the IPL.

This ends the procedure.

10. Does the same reference code appear on the control panel?

Yes **No**

↓ Go to "Starting Point For All Problems" on page 3 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 **Yes**

↓ Go to step 15 of this procedure.

12. Does the system have an alternative console on a second workstation IOP?

Yes **No**

↓ Go to step 14 of this procedure.

13. There is either a Licensed Internal Code problem or 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. BACKPL2 (see “Parts Assemblies” on page 761)

This ends the procedure.

14. The console, cables, or the workstation IOP card are 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:

- 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.
- If you have another working display, you can exchange the console 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. Workstation IOA
 - c. BACKPL2 (see “Parts Assemblies” on page 761)
 - d. 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?

No Yes

↓ Go to step 18 of this procedure.

16. Check or exchange the cables from the system to the failing display. Did this correct the problem?

Yes No

↓ Go to step 12 of this procedure.

17. You corrected the problem.

This ends the procedure.

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18. DANGER

To prevent a possible electrical shock, do not use the port tester during electrical storms. (RSFTD006)

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.

19. Find the input cable to the failing console or port.

Is the failing console or the failing port attached to a protocol converter?

No 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. Go to step 21 of this procedure.

20. Perform the following:

- a. Disconnect the input cable from the failing console.
- b. Connect the port tester to the input cable.

21. 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.

Press and hold the test switch on the port tester for 15 seconds and observe the lights.

If the port tester has three lights, do the following:

- If only the top (green) light is on, go to step 31 of this procedure.
- If both the top (green) and center (yellow) lights are on, go to step 23 of this procedure.

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 24 of this procedure.
- If all lights are off, go to step 25 of this procedure.
- If all lights are on, go to step 22 of this procedure.

If the port tester has two lights, do the following:

- If only the top (green) light is on, go to step 31 of this procedure.
- If only the bottom (yellow) light is on, go to step 24 of this procedure.
- If both lights are off, go to step 25 of this procedure.
- If both lights are on, continue with the next step of this procedure.

22. 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 21 of this procedure.

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 18 of this procedure.

23. 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 *Port Tester Use* information.

This ends the procedure.

24. The cable network is bad. The wires in the cable between the console and the twinaxial workstation attachment are reversed. Go to step 30 of this procedure.
25. Perform the following:
- Find the twinaxial workstation attachment to which the failing console is attached.
 - Disconnect the cable from port 0 on that twinaxial workstation attachment.
 - Connect the port tester to port 0 on the attachment.
 - Set the selector switch on the port tester to the left (1) position.
26. Press and hold the test switch on the port tester for 15 seconds and observe the lights.

If the port tester has three lights, do the following:

- If both the top (green) and center (yellow) lights are on, continue with step 27 of this procedure.

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 27 of this procedure.
- If all lights are off, continue with step 27 of this procedure.
- If only the top (green) light is on, go to step 29 of this procedure.
- If all lights are on, go to step 28 of this procedure.

If the port tester has two lights, do the following:

- If only the top (green) light is on, go to step 29 of this procedure.
- If only the bottom (yellow) light is on, continue with step 27 of this procedure.
- If both lights are off, continue with step 27 of this procedure.
- If both lights are on, go to step 28 of this procedure.

27. The test indicated that there was no signal from the system. Reconnect the cable you disconnected and perform the following:
- Exchange the following parts:
 - Twinaxial workstation IOA card
 - BACKPL2 (see "Parts Assemblies" on page 761)
 - Power on the system to perform an IPL.

This ends the procedure.

28. The tester is in the self-test mode. Check the position of the selector switch.

Twinaxial Workstation PIPs

If the selector switch is not in the left (1) position, set the switch to the left (1) position and go to step 26 of this procedure.

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 25 of this procedure.

29. The cable to the workstation is the failing item.

Continue with the next step of this procedure.

30. Cable maintenance is a customer responsibility.

See the information listed below for more information on correcting cable problems.

- If the IBM cable system is being used to attach the workstation, see the following information:
 - *IBM Cabling System Planning and Installation Guide*, GA27-3361
 - *Using the IBM Cabling System with Communication Products*, GA27-3620
 - *IBM Cabling System Problem Determination Guide for Twinaxial Applications*, GA21-9491
- If the telephone twisted-pair cable is being used to attach the console, see:
 - *IBM 5299 Model 3 Terminal Multiconnector and IBM Twinaxial to Twisted-pair Adapter Planning, Installation, and Problem Analysis Guide*, GA27-3749
- If a twinaxial cable is being used to attach the console, see:
 - *IBM 5250 Information Display System Planning and Site Preparation Guide*, GA21-9337
 - *Twinaxial Cabling Troubleshooting Guide*, SY31-0703
- If a link protocol converter is being used to attach the console, see the link protocol converter service information for problem analysis.
- The cable must be repaired or exchanged.

Then power on the system to perform an IPL.

This ends the procedure.

31. 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.
- 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.
 - Exchange the following parts:
 - a. Console
 - b. Twinaxial workstation IOA
 - c. BACKPL2 (see “Parts Assemblies” on page 761)
 - d. Cables
 - 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.
 - If exchanging the failing items does not correct the problem, and the reference code was 5002, 5082, or 50FF, there may be a Licensed Internal Code problem. Go to “LIC-PIP3 (5077)” on page 326.
 - The problem may be caused by devices attached after the console on port 0.

This ends the procedure.

Workstation Adapter Problem Isolation Procedures

Overview

This section contains the procedures necessary to isolate a failure that is detected by the workstation adapter. These procedures are used when no display is available with which to perform online 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.

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 or Expansion Tower” on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

To prevent a possible electrical shock when adding or removing any devices to or from the system, ensure that the power cords for those devices are unplugged before the signal cables are connected or disconnected. If possible, disconnect all power cords from the existing system before you add or remove a device. (RSFTD203)

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent a possible electrical shock, do not use the port tester during electrical storms. (RSFTD006)

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

Read and understand the following service procedures before using this section:

Workstation Adapter PIPs

- “Powering On and Powering Off the System or Expansion Tower” on page 868
- “Determining a Primary or Alternative Console” in the *AS/400 Service Functions* information

WS-PIP1

Introduction:

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 533 before continuing with this procedure.

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. Are you using a workstation adapter console (type 6A58 or 6A59)?

No **Yes**

↓ Go to “WSAC-PIP1” on page 537.

This ends the procedure.

2. Perform the following:
 - a. Select the icon on the workstation to make it the console (you may have already done this). You must *save* the console selection. For more information see *Local Device Configuration* and *LAN, Frame-Relay and ATM Support*.
 - b. Access dedicated service tools (DST) by performing the following:
 - 1) Select Manual mode on the control panel.
 - 2) Use the selection switch on the control panel to display function 21 (Make DST Available). Press Enter on the control panel.
 - 3) 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 **Yes**

↓ The problem is corrected.

This ends the procedure.

3. Isolate the problem to one AS/400 system and one workstation (console) by doing the following:
 - a. Disconnect the power cable from the workstation.
 - b. Eliminate all workstations, cables, and connector boxes from the network except for one AS/400 system, one console, two connector boxes, and one cable.
 - c. Ensure that the cables that are connected to the console, the keyboard, and the AS/400 system are connected correctly and are not damaged.
4. Perform the following:
 - a. Ensure that the AS/400 system 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.

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). 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 **Yes**

↓ The problem is in a cable, connector box, or device you disconnected in step 3 of this procedure.

This ends the procedure.

6. Does the reference code A600 5005 appear on the control panel?

Yes **No**

↓ Go to "Starting Point For All Problems" on page 3 to correct the problem.

This ends the procedure.

7. Do you have another workstation, cable, and two connector boxes you can exchange with the workstation connected to the AS/400 system?

Yes **No**

↓ Go to step 10 of this 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 **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:

- Workstation adapter Licensed Internal Code
- Workstation adapter configuration
- Workstation IOA
- Communications IOP

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.

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 (see "Initial Program Load (IPL) Information" in the *AS/400 Service Functions* information).

If the sign-on display appears, the following parts are good:

- Communications IOP

Workstation Adapter PIPs

- 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.

10. One of the following is causing the problem:
 - Workstation adapter Licensed Internal Code
 - Workstation adapter configuration
 - Workstation
 - Cable
 - Connector box
 - Workstation IOA
 - Workstation IOP

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.

If you still have not corrected the problem, ask your next level of support for assistance.

This ends the procedure.

Workstation Adapter Console Problem Isolation Procedures

Overview

This section contains the procedures necessary to isolate a failure that is detected by the workstation adapter console. Use these procedures 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 or Expansion Tower" on page 868) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

To prevent a possible electrical shock when adding or removing any devices to or from the system, ensure that the power cords for those devices are unplugged before the signal cables are connected or disconnected. If possible, disconnect all power cords from the existing system before you add or remove a device. (RSFTD203)

DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

To prevent a possible electrical shock, do not use the port tester during electrical storms. (RSFTD006)

DANGER

To prevent power from switching on automatically during service procedures, select manual or secure mode on the system unit control panel or disconnect the cables that connect to J15 and J16 on the frame being serviced. (RSFTD211)

Read and understand the following service procedures before using this section:

- “Powering On and Powering Off the System or Expansion Tower” on page 868
- “Determining a Primary or Alternative Console” in the *AS/400 Service Functions* information
- “Card Removal and Installation” in “Chapter 4. Removal and Installation Procedures” on page 593.
- “Expansion Tower Locations and Addresses” on page 687

WSAC-PIP1

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that reported the problem.

Read the “Overview” on page 536 before continuing with this procedure.

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. 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 into the CFIOP.
 - The workstation console cable is attached.

Workstation Adapter Console PIPs

Notes:

- a. Card information:
 - Hardware that is associated with 6A58 feature is the type 2612 card.
 - Hardware that is associated with 6A59 feature is the type 2609, 2721 , or 2745 card.
- b. Cable information:
 - If the IOA is type 2612, 2721 or 2745, the cable attaches directly to the IOA.
 - If the IOA is type 2609, the cable attaches to the two-port adapter cable on the port labeled P2.

Did you find a problem with any of the conditions listed above?

No **Yes**

↓ Correct the problem. Then perform an IPL of the system.

This ends the procedure.

2. 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 (see *AS/400 Service Functions*).
 - 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 **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.

3. Do you have SRC A600 5001, A600 5004, A600 5007, or B075 xxxx (where xxxx is any value)?

No **Yes**

↓ Perform the following for the type of IOA card you have:

Type 2609:

- a. Disconnect the cable that is attached to the two-port adapter cable port that is labeled P2.
- b. Install the BB wrap plug on the P2 connection of the two-port adapter cable.
- c. Perform an IPL in Manual mode.

Type 2612, 2721, or 2745:

- a. Disconnect any cables that are attached to the IOA.
- b. Install the wrap plug on the IOA. The 2612 wrap plug label is BB. The 2721 and 2745 wrap plug label is QQ.
- c. Perform an IPL in Manual mode.

4. Does SRC 6A58 5007 or 6A59 5007 occur?

No **Yes**

Workstation Adapter Console PIPs

- ↓ One of the following is causing the problem:
- Workstation emulation program
 - Workstation
 - Workstation console cable

This ends the procedure.

5. Did SRC A600 5001, A600 5004, 6A58 5008, or 6A59 5008 occur?

No Yes

- ↓ One of the following is causing the problem:

Type 2609:

- Workstation adapter
- Two-port adapter cable

Type 2612, 2721, or 2745:

- Workstation adapter

This ends the procedure.

6. This is a new problem. Use the new reference code to correct the problem (see “Chapter 2. Unit Reference Codes” on page 17) or ask your next level of support for assistance.

This ends the procedure.

Failing Items

This table is used to find field replaceable unit (FRU) part numbers identified by a failing item code. If only a type number is listed, go to the “Type, Model, and Part Number List” on page 750 to determine the part number.

Failing Item Code	Description/Action If only a type number is listed, go to the “Type, Model, and Part Number List” on page 750 to determine the part number.
FI00015	FI00015 indicates that a Local Bus Adapter card in a migrated tower is the failing item. Read the card position in the <i>Location</i> column of the reference code table. Using the location information, see “FC 5077 – Migrated Tower Base Unit” on page 710 locations diagram and the associated Table 33 on page 710 table to determine the CCIN, part number and removal and installation procedure for the Local Bus Adapter card.

Failing Items

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00017	<p>FI00017 indicates that a Local Bus Adapter card or an optical bus driver card is the failing item.</p> <p>Read the card position in the <i>Location</i> column of the reference code table.</p> <p>The chart below will point to the appropriate locations diagram and associated table. Use this information and the card position information to determine the CCIN, part number and removal and installation procedure for the failing item.</p> <p>Unit Reference Code</p> <ul style="list-style-type: none"> • F302 through F30F, B302 through B30F, 7302 through 730F, F3FF, B3FF, 73FF <ul style="list-style-type: none"> – See "FC 5077 – Migrated Tower Base Unit" on page 710 locations diagram and the associated Table 33 on page 710 table. <p>Unit Reference Code</p> <ul style="list-style-type: none"> • F401, B401, 7401 <ul style="list-style-type: none"> – The local bus adapter card in the FC 503x BaseUnit is the failing item. See Table 28 on page 692, and its associated locations diagram, "FC 5033 – Migrated Tower Base Unit" on page 689, "FC 5034 – Migrated Tower Base Unit" on page 690, "FC 5035 – Migrated Tower Base Unit" on page 691. <p>Unit Reference Code</p> <ul style="list-style-type: none"> • F402 through F406, B402 through B406, 7402 through 7406, F40C, B40C, 740C <ul style="list-style-type: none"> – See "FC 5034, FC 5035 – PCI Expansion Unit" on page 695 locations diagram and the associated Table 29 on page 695 PCI Expansion Unit FRU positions table. <p>Unit Reference Code</p> <ul style="list-style-type: none"> • F408 through F40B, B408 through B40B, 7408 through 740B, F40D, B40D, 740D <ul style="list-style-type: none"> – See "FC 5034, FC 5035 – SPD Expansion Unit" on page 700, locations diagram and the associated Table 30 on page 701 PCI Expansion Unit FRU positions table.
FI00021	This FI code does not apply to migrated expansion towers.
FI00030	<p>FI00030 indicates a main storage card failure.</p> <p>Power SRC 1xxx-xxxx No FRU replacement.</p>
FI00040	See the symbolic FRU "BACKPLN" on page 560.
FI00050	See FI00060
FI00055	<p>FI00055 indicates that a primary optical link cable is the failing item.</p> <p>This is either the optical bus cable for the bus you are working with or its paired bus cable on the optical link card.</p>
FI00056	FI00056 indicates that any optical bus cable or a missing optical bus wrap connector is the failing item.
FI00057	<p>FI00057 indicates that the secondary optical link cable is the failing item.</p> <p>This is the optical cable that runs between the bus expansion adapter cards in two separate expansion units.</p>

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00060, FI00062, FI00065	<p>FI00060, FI00062, and FI00065 indicate that any card, cable, or card enclosure connected to the failing bus may be the failing item.</p> <p>Perform BUS PIP 1, see "BUS-PIP Entry Point" on page 237 to determine the failing item. Use the following list to help in problem analysis. For details on the card type or part number, see "Type, Model, and Part Number List" on page 750.</p> <ul style="list-style-type: none"> • Any I/O adapter • Any I/O processor • Parts on bus 0004 only: <ul style="list-style-type: none"> – CFIOF – HSL (SI) I/O Adapter card. For FC 503x migrated towers see symbolic FRU "CVTCARD" on page 567. For FC 5077 migrated towers see symbolic FRU "LBSADP1" on page 574. • Parts on the optically-connected unit only: <ul style="list-style-type: none"> – Remote bus expansion adapter—see FI00203 • System bus parts: <ul style="list-style-type: none"> – Local SPD Bus Adapter card. See symbolic FRU "LBUSADP" on page 575. – Card enclosure – Bus extension cables – Backplane – For FC 5033, FC 5034, and FC 5035 migrated towers only – Power supply – For FC 5033, FC 5034, and FC 5035 migrated towers only – Cable to expansion tower
FI00070	<p>FI00070 indicates that a storage device attached to the IPL device IOP is the failing item.</p> <p>Determine the IPL device that is failing by doing the following:</p> <ol style="list-style-type: none"> 1. For a failing logical partition, other than the Primary partition, on systems with multiple logical partitions, go to the "Work with partition status" screen and determine the active IPL type (source). 2. For a failing Primary partition or for systems with only one partition select function 01 (Select IPL) on the control panel to display the active IPL type. <p>If the IPL storage device is not the failing item, then any storage device attached to the IPL device IOP may be the failing item.</p>
FI00071	<p>FI00071 indicates that the cable from the magnetic storage IOP to the IPL device is the failing item.</p> <p>The following list shows the lengths and the part numbers of this cable:</p> <ul style="list-style-type: none"> • 0.6 meter—part 6495253 • 0.75 meter—part 6495249 • 1.5 meters—part 6495254 • 2.5 meters—part 6495250 • 4.0 meters—part 6495252 • 6.0 meters—part 6495251 • 10.0 meters—part 6495255 • 20.0 meters—part 6495256 • 30.0 meters—part 6495257 • 40.0 meters—part 6495258 • 60.0 meters—part 6495264

Failing Items

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00072	<p>FI00072 indicates that the load-source media is the failing item.</p> <p>If the load source is tape, exchange the tape in the alternate IPL tape unit.</p> <p>If the load source is an optical storage unit, exchange the compact disk.</p> <p>If the load source is a disk unit, exchange the disk unit.</p> <p>If replacing the media does not solve the problem, try replacing the drive.</p>
FI00092	<p>FI00092 indicates that the load-source for an alternate IPL or the interface to the load-source is the failing item.</p> <p>Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.</p> <p>Note: If the load source is an optical unit, you may need to perform function 3 to IPL the system again. This will make the unit ready.</p> <p>To locate the alternate load-source for a system that does not have multiple partitions see "Determining the Load-Source Disk and Alternate IPL Device" in the system Problem Analysis Book. To locate the alternate load-source for the primary partition or to locate the alternate IPL load-source for a secondary partition on a system that has multiple partitions see <i>AS/400 Service Functions</i>.</p> <p>Use the device type to determine the part.</p>
FI00096	<p>FI00096 indicates that the IOP attached to the load-source device is the failing item.</p> <p>Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.</p> <ol style="list-style-type: none"> 1. Verify that the IPL type is correct: <ul style="list-style-type: none"> • For a failing logical partition, other than the Primary partition, on systems with multiple logical partitions, go to the "Work with partition status" screen and determine the active IPL type (source). • For a failing Primary partition or for systems with only one partition select function 01 (Select IPL) on the control panel to display the active IPL type. Select function 01 on the control panel and press the Enter key to display the present IPL mode. 2. The failing IOP may have a removable storage I/O adapter FRU. Replace the storage IOA first using the STORIOA symbolic FRU. To locate the load source for a system that does not have multiple partitions or to locate the load source for the Primary partition on a system that has multiple partitions see "Determining the Load Source Disk and Alternate IPL Device" in the correct system Problem Analysis guide. To locate the load-source for a secondary partition see <i>AS/400 Service Functions</i>.

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00098	<p>FI00098 indicates that the load-source disk device is the failing item. Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.</p> <p>Determine the disk unit 1 type number. It is printed on a label on the front of the system frame.</p> <p>If the system does not have a label that identifies the disk unit type, you can determine the part number of the disk unit by looking at a label located on the disk unit. You must remove the disk unit to see this label.</p> <p>Exchange the disk drive and logic card for the disk unit type you have (see "Type, Model, and Part Number List" on page 750).</p> <p>To locate the load source for a system that does not have multiple partitions or to locate the load source for the Primary partition on a system that has multiple partitions see "Determining the Load Source Disk and Alternate IPL Device" in the correct system Problem Analysis guide. To locate the load-source for a secondary partition see <i>AS/400 Service Functions</i>.</p>
FI00099	<p>FI00099 indicates that the Licensed Internal Code failed or responded in an unpredictable way.</p> <p>Ask your next level of support for assistance.</p>
FI00121	<p>FI00121 indicates that any tape or optical storage device attached to the I/O (SCSI) bus of this IOP may be the failing item.</p> <p>Use the device type to determine the part.</p>
FI00122	<p>FI00122 indicates that a reserved IOA port on the IOP is the failing item.</p> <p>If the IOP is type 2624, the failing item is type 6146 IOA.</p>
FI00123	<p>See the symbolic FRU "DEVTERM" on page 568.</p>
FI00130	<p>FI00130 indicates that the Licensed Internal Code for one of the IOPs or IOAs is the failing item.</p> <p>Determine the IOP or IOA type and location (see "SRC Address Formats" on page 878).</p> <p>Get the type from the card at that address.</p> <p>Look for PTFs associated with the reference code and the identified hardware type and have the customer apply them.</p> <p>Note: If DASD is not attached to the IOP, using the VRYCFG RESET(*YES) command may correct the problem. If DASD is attached to the IOP, an IPL must be performed to restart the IOP.</p>
FI00131	<p>FI00131 indicates that one of the IOPs or IOAs, if active, is the failing item.</p> <p>Determine the IOP or IOA type and location (see "SRC Address Formats" on page 878).</p> <p>Get the type from the card at that address.</p> <p>Attention: Disconnecting or removing the type 2620 or type 2628 cryptographic I/O processor causes the loss of the master encryption key. Read "Important Cryptographic I/O Processor Information" on page 884 before disconnecting or removing the cryptographic I/O processor.</p> <p>Use the IOP or IOA type to determine the part.</p>

Failing Items

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00132	<p>FI00132 indicates that one of the IOAs, if attached, is the failing item.</p> <p>Perform "BUS-PIP5" on page 265 to isolate the failing IOA.</p>
FI00140	<p>FI00140 indicates that the IOP for the type 636x Tape Unit is the failing item.</p> <p>The failing IOP is the type 2621 IOP.</p>
FI00141	<p>FI00141 indicates that the IOP for the 7208 Tape Drive is the failing item.</p> <p>The failing IOP is the type 2621 IOP.</p>
FI00142	<p>FI00142 indicates that the external cable for the diskette unit is the failing item.</p> <p>Use the IOP type to determine the cable part:</p> <ul style="list-style-type: none"> • 2624 with 6146 IOA—part 46G3658 <p>Note: When exchanging the external cable for the diskette unit, all subsystems attached to both sides of the cable must be made inactive. If not, all jobs will be stopped when the cable is disconnected.</p>
FI00180	<p>FI00180 indicates a loss of power to a secondary frame. The control panel of the secondary frame shows one of the following conditions:</p> <ul style="list-style-type: none"> • A power SRC is displayed. • The Power light is not on. <p>Perform "Cannot Power On Secondary Frame (No SRC)" in chapter 1 of the system problem analysis manual to correct the problem.</p>
FI00182	<p>FI00182 indicates that the local optical link card is the failing item.</p> <ul style="list-style-type: none"> • If the fifth character of word 5 (xxxx <u>xxxx</u>) is 1, 5, 9, or D—2686 (266Mb/s) • If the fifth character of word 5 (xxxx <u>x</u>xxx) is 3, 7, B, or F—2688 (1062Mb/s)
FI00185	<p>FI00185 indicates that the 12-port ASCII workstation attachment cable is the failing item.</p>
FI00186	<p>FI00186 indicates that the optical cable in the top position (even bus) of the SPD optical bus driver card is the failing item.</p>
FI00187	<p>FI00187 indicates that the optical cable configuration is the failing item.</p> <p>Perform BUS PIP 1, see "BUS-PIP Entry Point" on page 237 to correct the problem.</p>
FI00189	<p>FI00189 indicates that the bus extension card configuration is the failing item.</p> <p>Perform BUS PIP 1, see "BUS-PIP Entry Point" on page 237 to correct the problem.</p>
FI00200	<p>FI00200 indicates that the ac module or the removable power cable is the failing item.</p> <p>The following list shows the possible failing ac modules:</p> <ul style="list-style-type: none"> • Migrated Tower SPCN panel card (SPNLCARD): • FC 5070, 5072, 5080, 5082 — part 87G6300 • FC 5071, 5073, 5081, 5083 — part 21H7697 • System Unit Expansion Tower Card (FC 5065) — part 97H7532 <p>See "Power Cord Part Numbers and Receptacle Descriptions" on page 828 to determine the power cable part number for systems in your country.</p>
FI00203	<p>FI00203 indicates that the SPD optical bus receiver card in the bus expansion unit is the failing item.</p> <p>Use the adapter card type in the bus expansion unit to determine the part.</p>
FI00204	<p>FI00204 indicates that the bus cable between the system unit and the bus expansion unit is the failing item.</p>

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00205	<p>FI00205 indicates that the remote bus expansion adapter for the paired bus is the failing item.</p> <p>Use the adapter card type in the bus expansion unit to determine the part.</p>
FI00206	<p>FI00206 indicates that a type 2685 SPD optical bus receiver is the failing item.</p> <p>Perform BUS PIP 1, see "BUS-PIP Entry Point" on page 237.</p>
FI00230	<p>FI00230 indicates that the Licensed Internal Code for the failing node is the failing item and needs to be restored.</p> <p>Determine the type of node and select the Licensed Internal Code load.</p> <p>Primary node AJSFDJ04</p> <p>Secondary node AJSFDJ05</p>
FI00235	<p>FI00235 indicates that an SPCN cable that connects two frames or a frame to a node is the failing item.</p> <p>Perform "Cannot Power On Secondary Frame (No SRC)" in chapter 1 of the system problem analysis manual (either <i>AS/400e server 270, and 820 Problem Analysis, Repair and Parts</i> or <i>AS/400e server 830, 840, SB2, and SB3 Problem Analysis, Repair and Parts</i>).</p> <p>The following list shows the lengths and part numbers of the possible failing items:</p> <ul style="list-style-type: none"> • 6.0 meters—part 21F9469 • 15.0 meters—part 21F9358 • 30.0 meters—part 21F9359 • 60.0 meters—part 21F9360 • 100.0 meters (SPCN optical cable)—part 21F9415 • SPCN optical adapter—part 90H6287 • SPCN port cable (frame-to-node)—part 21F9362
FI00236	<p>FI00236 indicates that the frame control panel is the failing item.</p> <p>The following list shows the possible failing items:</p> <ul style="list-style-type: none"> • 9309 multi-purpose frame: <ul style="list-style-type: none"> – Control panel — part 89X2895
FI00237	<p>FI00237 indicates that one of the cards powered by I/O regulator 1 is the failing item.</p> <p>Perform SPCN-PIP2 in the <i>FC 504x Problem Analysis and Repair and Parts</i> information to determine the failing item.</p>
FI00238	<p>FI00238 indicates that one of the cards powered by I/O regulator 2 is the failing item.</p> <p>Perform SPCN-PIP2 in the <i>FC 504x Problem Analysis and Repair and Parts</i> information to determine the failing item.</p>
FI00239	<p>FI00239 indicates that the support box tray is the failing item.</p> <p>One of the following parts may be installed:</p> <ul style="list-style-type: none"> • 74F1649 • 21F5861 • 17G2504

Failing Items

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00240	<p>FI00240 indicates that an SPCN node is the failing item.</p> <p>The system cannot identify the type of node. Determine the failing node and exchange the failing item.</p> <p>The following list shows the possible failing items:</p> <ul style="list-style-type: none"> • Migrated Tower SPCN panel card (SPNLCARD) • Secondary frame SPCN node • FC 5072 and 5082 frame ac module — part 87G6300 • FC 5073 and 5083 frame ac module — part 21H7697 • FC 9309 frame Power control compartment <ul style="list-style-type: none"> – part 21F9008 for 1 Phase Domestic – part 21F9009 for 1 Phase World Trade – part 21F9019 for 2 Phase World Trade – part 21F9020 for 2 Phase World Trade • FC 5065 expansion tower card (TWRCARD) — part 97H7532
FI00244	<p>FI00244 indicates that one of the loads on the +28 V dc line in the FC 5043 or FC 5044 System Unit Expansion is the failing item.</p> <p>The following load on the +28 V dc line from I/O regulator 1 is causing an overcurrent condition:</p> <ul style="list-style-type: none"> • A logic card in card slots 1 through 7
FI00245	<p>FI00245 indicates that the card enclosure for an unknown unit type is the failing item.</p> <p>System Units and System Expansion Units—see Symbolic FRU "BACKPLN" on page 560.</p>
FI00246	<p>FI00246 indicates that one of the loads on the +28 V dc line in the FC 5043 or 5044 System Unit Expansion is the failing item.</p> <p>The following load on the +28 V dc line from I/O regulator 2 is causing an overcurrent condition:</p> <ul style="list-style-type: none"> • A logic card in card slots 8 through 13
FI00248	<p>FI00248 indicates that the card enclosure in the FC 5043 or FC 5044 System Unit Expansion is the failing item.</p> <p>The following list shows the possible failing items:</p> <ul style="list-style-type: none"> • 5044 System Unit Expansion Box—part 74F1543 • 5043 Bus Extension Unit—part 74F1544
FI00251	<p>FI00251 indicates that a battery power unit is the failing item.</p> <p>The following list shows the possible failing items:</p> <ul style="list-style-type: none"> • Bus Expansion Units and the Storage Expansion Units use the following: <ul style="list-style-type: none"> – Internal Battery Power Unit 1 and 2 battery pack—part 86G8040 – Internal Battery Power Unit 1 and 2 charger—part 86G8020 – External Battery Power Unit 2 battery pack—part 86G7714 – External Battery Power Unit 2 charger—part 86G7750 – External Battery Power Unit 2 cable—part 86G7712 • 9309 general purpose I/O frame with SPCN (FC 9171)—part 21F9380 • FC 5065 expansion tower <ul style="list-style-type: none"> – Battery unit assembly—part 97H7320 (4x) – Battery unit charger—part 97H7316

Failing Items

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00253	<p>FI00253 indicates that a battery power unit charger is the failing item.</p> <p>The following list shows the possible failing items:</p> <ul style="list-style-type: none"> • Internal Battery Power Unit 1 or 2 charger—part 86G8020 • External Battery Power Unit 2 charger—part 86G7750 • 9309 general purpose I/O frame with SPCN (FC 9171)—part 21F9380
FI00255	<p>FI00255 indicates that a regulator is the failing item.</p> <p>The following list shows the possible failing items:</p> <ul style="list-style-type: none"> • Migrated Tower Expansion (FC 507x except 5077) — part 87G6049 • Storage Expansion Tower (FC 508x) — part 17G1209
FI00256	<p>FI00256 indicates that a regulator in the FC 5032 Removable Storage Unit is the failing item.</p> <p>Exchange the following items, one at a time, until the problem is corrected: • 636x • 6378 • 6379 • 6380 • 6390 • D/SE module—part 21F8890</p>
FI00300	<p>FI00300 indicates that media is the failing item.</p> <p>If the load source is:</p> <ul style="list-style-type: none"> • Tape, exchange the tape in the alternate IPL tape unit. • An optical storage unit, exchange the compact disk. • DASD, exchange the DASD. <p>If installing from:</p> <ul style="list-style-type: none"> • Tape, exchange the tape in the alternate IPL tape unit. • An optical storage unit, exchange the compact disk.
FI00301	<p>FI00301 indicates that the I/O processor is the failing item. Use the IOP type to determine the part.</p>
FI00302	<p>FI00302 indicates that the Licensed Internal Code for the I/O processor is the failing item. Ask your next level of support for assistance.</p>
FI00310	<p>FI00310 indicates that an I/O processor card or an I/O adapter card is the failing item.</p> <p>Perform BUS PIP 1, see "BUS-PIP Entry Point" on page 237.</p>
FI00315	<p>FI00315 indicates that the battery power unit install time life has been exceeded.</p>
FI00316	<p>FI00316 indicates that no I/O processors were found on the bus.</p> <p>Verify the configuration information for the system. If a bus is configured to be empty, there is no problem.</p>
FI00317	<p>FI00317 indicates that the I/O processor cards at consecutive direct select addresses appear to be failing.</p> <p>The I/O processor cards or a damaged backplane could cause this problem.</p>
FI00318	<p>FI00318 indicates that an I/O adapter card attached to an I/O processor card on the failing bus is the failing item.</p>
FI00319	<p>FI00319 indicates that the Licensed Internal Code on an I/O processor is the failing item. Install a PTF to correct the problem.</p> <p>Ask your next level of support for assistance.</p>
FI00320	<p>FI00320 indicates that the display station used as the console is the failing item.</p>

Failing Items

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00330	<p>FI00330 indicates that cryptographic hardware is the failing item.</p> <p>The following list shows the possible failing items:</p> <ul style="list-style-type: none"> • Cryptographic I/O processor • Security Interface Unit • AS/400 system to Security Interface Unit cable
FI00360	FI00360 indicates that the IPL disk device is the failing item.
FI00380	On the bus with the system console or the failing logical partition's console the failing item is the first workstation IOP card or the workstation IOA card. The bus with the system console is bus 0001. For systems with multiple logical partitions the Primary partition's console is on bus 0001 and the consoles for other logical partitions are determined by the LPAR configuration.
FI00500	<p>FI00500 indicates that the cable from the storage device IOP to the storage device is the failing item.</p> <p>The following list shows the lengths and part numbers of this cable:</p> <ul style="list-style-type: none"> • 0.6 meter—part 6495253 • 0.75 meter—part 6495249 • 1.5 meters—part 6495254 • 2.5 meters—part 6495250 • 4.0 meters—part 6495252 • 6.0 meters—part 6495251 • 10.0 meters—part 6495255 • 20.0 meters—part 6495256 • 30.0 meters—part 6495257 • 40.0 meters—part 6495258 • 60.0 meters—part 6495264
FI00580	<p>FI00580 indicates that any storage device may be the failing item.</p> <p>The address of the failing storage device cannot be determined.</p>
FI00581	<p>FI00581 indicates that a storage device at the address identified by the problem isolation procedures for the reference code is the failing item.</p> <p>Use the service information of the I/O device to continue analyzing the problem.</p>
FI00584	<p>FI00584 indicates that any storage device may be the failing item.</p> <p>The address of the failing storage device cannot be determined.</p>
FI00601	<p>FI00601 indicates that the display station is the failing item.</p> <p>If a link protocol converter is used to connect the console to the system, the protocol converter is the failing item.</p>
FI00602	FI00602 indicates that the cable between the workstation attachment and the device is the failing item.
FI00603	FI00603 indicates that the 5299 Multiconnector is the failing item.
FI00604	<p>FI00604 indicates that a printer is the failing item.</p> <p>Use the printer device information to analyze the problem.</p>
FI00605	FI00605 indicates that a magnetic stripe reader on a display station is the failing item.
FI00606	FI00606 indicates that the storage media is the failing item.

Failing Items

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00607	FI00607 indicates that a selector light pen attached to a display station is the failing item.
FI00608	FI00608 indicates that the link protocol converter is the failing item.
FI00610	<p>FI00610 indicates that the twinaxial workstation IOP or the twinaxial workstation IOA attached to a communications IOP or combined function IOP (CFIOP) is the failing item.</p> <p>Use the workstation IOP or IOA type to determine the part.</p> <p>Note: * You may exchange a 2-connector card with a 1-connector card, but this needs an adapter cable (part 22F0097) to change from a 25-pin D-shell connector on the card end to two 9-pin D-shell connectors (4-port twinaxial workstation attachment ends).</p>
FI00611	<p>FI00611 indicates that:</p> <p>Either the ASCII workstation IOP (6141) or the 12-port attachment (part 59X3816) or both are the failing items.</p>
FI00612	FI00612 indicates that the cable between the 6-port attachment or the 12-port attachment and the device is the failing item.
FI00613	FI00613 indicates that the display station used as the console is the failing item.
FI00614	<p>FI00614 indicates that a unit reference code of FFFF was indicated when the user entered the ANZPRB (Analyze Problem) command from a workstation.</p> <p>The failing items for this error can be identified by running the complete ANZPRB command. The failing items are also in the problem log when the WRKPRB command is entered.</p>
FI00615	<p>FI00615 indicates that the twinaxial workstation attachment cable is the failing item.</p> <p>Check the twinaxial workstation attachment cable for the part number.</p>
FI00616	<p>FI00616 indicates that the 5259 Migration Data Link is the failing item.</p> <p>Exchange the 5259 Migration Data Link.</p>
FI00626	<p>FI00626 indicates that the modem on the failing port is the failing item.</p> <p>Exchange the modem.</p>
FI00630	<p>FI00630 indicates that the multiline communications IOP is the failing item.</p> <p>Use the IOP type to determine the part.</p>
FI00631	FI00631 indicates that a cable other than the cable from the workstation IOA to the first device is the failing item.
FI00632	FI00632 indicates that the cable from the workstation IOA to the first device is the failing item.
FI00700	<p>FI00700 indicates that the remote data terminal equipment (DTE) or an attached device is the failing item.</p> <p>Report this problem to the operator of the remote equipment.</p>
FI00701	<p>FI00701 indicates that a local communications cable is the failing item.</p> <p>Use the cable to determine the part.</p>
FI00702	<p>FI00702 indicates that the local cable for the automatic call unit is the failing item.</p> <p>Check the automatic call unit interface cable for the part number.</p>
FI00703	FI00703 indicates that the automatic call unit is the failing item.
FI00704	FI00704 indicates that the local data circuit-terminating equipment (DCE) is the failing item.

Failing Items

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00705	<p>FI00705 indicates that the remote data circuit-terminating equipment (DCE) is the failing item.</p> <p>Report this problem to the operator of the remote equipment.</p>
FI00708	<p>FI00708 indicates that the local communications cable (X.21 interface) is the failing item.</p> <p>Check the communications cable for the part number.</p>
FI00709	<p>FI00709 indicates that the local communications cable (V.35 interface) is the failing item.</p> <p>Check the communications cable for the part number.</p>
FI00710	<p>FI00710 indicates that the local communications cable (V.24 interface with remote power on) is the failing item.</p> <p>The remote power on feature is given support by using an available pin on the EIA-232/V.24 enhanced or EIA-232/V.24 non-enhanced cables. Check the communications cable for the part number.</p>
FI00711	<p>FI00711 indicates that the local communications cable (token-ring interface cable) is the failing item.</p> <p>Note: An "IBM Cabling System Patch Cable" or a comparable cable may have been supplied by the user to increase the length of this cable. Any cable attached to the token-ring interface cable may also be the failing item.</p>
FI00712	<p>FI00712 indicates that the token-ring access unit is the failing item.</p>
FI00716	<p>FI00716 indicates that the EIA-232/V.24 enhanced cable is the failing item.</p> <p>Check the communications cable for the part number.</p>
FI00717	<p>FI00717 indicates that the EIA-232/V.24 non-enhanced cable is the failing item.</p> <p>Check the communications cable for the part number.</p>
FI00718	<p>FI00718 indicates that an IOP card is the failing item.</p> <p>Use the IOP type to determine the part.</p>
FI00719	<p>FI00719 indicates that an IOA card is the failing item.</p> <p>Use the IOA type to determine the part.</p>
FI00720	<p>FI00720 indicates that the Ethernet transceiver is the failing item.</p> <p>Verify that the signal quality error switch in the transceiver that the Ethernet is attached to is set to active.</p> <p>See the transceiver operator's guide for correct operation or correct removal and installation procedure.</p>
FI00721	<p>FI00721 indicates that the token-ring IOA card is the failing item.</p> <p>Use the IOA type to determine the part.</p>
FI00722	<p>FI00722 indicates that the cable attached to the local area network IOA is the failing item.</p>
FI00723	<p>FI00723 indicates that the communications two-port adapter cable for the communications IOA card is the failing item.</p> <p>Exchange the communications two-port adapter cable.</p> <p>If this does not correct the problem, use the IOA type to determine the part.</p>
FI00725	<p>FI00725 indicates that the Ethernet IOA card is the failing item.</p> <p>Use the IOA type to determine the part.</p>

Failing Items

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00726	<p>FI00726 indicates that a communications IOA card is the failing item:</p> <p>Use the IOA type to determine the part.</p>
FI00727	<p>FI00727 indicates that one of the IOAs attached to either a combined function I/O processor (CFIOP), multiline communications IOP or an Integrated Netfinity Server for AS/400 is the failing item.</p> <p>Perform "BUS-PIP5" on page 265 to isolate the failing IOA.</p>
FI00728	<p>FI00728 indicates that the local communications cable (RS449/V.36 interface) is the failing item.</p> <p>Check the communications cable for the part number.</p>
FI00730	<p>FI00730 indicates that the Licensed Internal Code module for an I/O card may be the failing item.</p> <p>Ask your next level of support for assistance.</p>
FI00731	<p>FI00731 indicates that one of the distributed data interface IOAs is the failing item.</p> <p>Use the IOA type to determine the part.</p>
FI00732	<p>FI00732 indicates that the cryptographic IOP card is the failing item.</p> <p>Attention: Disconnecting or removing the type 2620 or type 2628 cryptographic I/O processor causes the loss of the master encryption key. Read "Important Cryptographic I/O Processor Information" on page 884 before disconnecting or removing the cryptographic I/O processor.</p> <p>Use the IOP type to determine the part.</p>
FI00733	<p>FI00733 indicates that one of the following personal security cards is the failing item:</p> <ul style="list-style-type: none"> • Full function—part 41F9970 • Limited function—part 82F5486
FI00734	<p>FI00734 indicates that one of the following security interface units is the failing item:</p> <ul style="list-style-type: none"> • 4754-001—82F0421 • 4754-L01—82F0422
FI00735	<p>FI00735 indicates that the optical bypass switch is the failing item.</p> <p>See the optical bypass switch information for correct operation, removal, and installation procedures for the optical bypass switch.</p>
FI00741	<p>FI00741 indicates that the telephone cable to the wall outlet is the failing item.</p> <p>Check the cable for the part number.</p>
FI00742	<p>FI00742 indicates that the communications coupler is the failing item.</p> <p>Check the coupler for the part number.</p>
FI00750	<p>FI00750 indicates that the wireless LAN IOA is the failing item.</p> <p>Use the IOA type to determine the part.</p>
FI00751	<p>FI00751 indicates that the Licensed Internal Code module is the failing item.</p> <p>Ask your next level of support for assistance.</p>
FI00752	<p>FI00752 indicates that the file server IOA card is the failing item.</p> <p>Use the IOA type to determine the part.</p>

Failing Items

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00810	<p>FI00810 indicates that the magnetic tape is the failing item.</p> <p>Exchange the magnetic tape.</p>
FI00820	<p>FI00820 indicates that the 2440 Tape Unit or the 9348 Tape Unit is the failing item.</p> <p>If the 2440 Tape Unit is the failing item, see "Diagnostic Information" in the <i>2440 Magnetic Tape Subsystem Service Guide</i>.</p> <p>If the 9348 Tape Unit is the failing item, see "Analyzing Problems" in the <i>9348 Tape Unit Service Information</i>.</p>
FI00830	<p>FI00830 indicates that the external signal cable is the failing item.</p> <p>See "EXTSCSI" on page 571 for cable part numbers.</p>
FI00832	<p>FI00832 indicates that the external signal cable is the failing item.</p> <p>See "EXTSCSI" on page 571 for cable part numbers.</p>
FI00840	<p>FI00840 indicates that the device controller for the attached device is the failing item.</p> <ul style="list-style-type: none"> • Type 7208—see FI00882 • Type 9337—see the <i>9337 Disk Array Service Information</i>. • Type 9427—see FI00882
FI00841	<p>FI00841 indicates that the terminating plug for the attached device is the failing item.</p> <ul style="list-style-type: none"> • For tape devices—see FI00880 • Type 9337—part 85F7887
FI00842	<p>FI00842 indicates that the external signal cable for the attached device is the failing item.</p> <ul style="list-style-type: none"> • For tape devices—see FI00830. • Type 9337—see FI00832.
FI00844	<p>FI00844 indicates that the device controller for the attached device is the failing item.</p> <ul style="list-style-type: none"> • For tape devices—see FI00882 • For type 9337, see "Analyzing Problems" in the service information for the specific 9337 model installed on the system.
FI00845	<p>FI00845 indicates that the external signal cable is the failing item.</p> <p>Is the I/O processor type 2644?</p> <p>Yes No</p> <p>↓ See EXTSCSI.</p> <p>The failing items may be:</p> <ul style="list-style-type: none"> • Adapter cable—part 62X3421
FI00850	<p>FI00850 indicates that the interface cables attached to the tape IOP are the failing items.</p>
FI00851	<p>FI00851 indicates that the I/O device attached to the tape IOP is the failing item.</p> <p>Use the service information of the I/O device to continue analyzing the problem.</p>
FI00852	<p>FI00852 indicates that the tape I/O processor (TIOP) adapter cable is the failing item.</p> <p>The following list shows the possible failing item and its part number:</p> <ul style="list-style-type: none"> • TIOP type 2644 adapter cable—part 6472924

Failing Items

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00853	<p>FI00853 indicates that a terminating plug on the tape unit channel is the failing item.</p> <p>The following list shows the possible failing items and their part numbers:</p> <ul style="list-style-type: none"> • Terminating plug for tape unit bus lines—part 2282675 • Terminating plug for tape unit tag lines—part 2282676 • 78-pin terminating plug—part 6473048
FI00855	<p>FI00855 indicates that the type of tape unit attached to the tape IOP is not correct.</p> <p>One of the following tape unit types can be attached to the tape IOP: • 3422 • 3430 • 3480 • 3490 • 3494</p>
FI00856	<p>FI00856 indicates that an active tape IOP is the failing item.</p> <p>Use the IOP type to determine the part.</p>
FI00870	<p>FI00870 indicates that a storage device is the failing item.</p> <p>Use the device type to determine the part.</p> <p>Note: The 636x Tape Unit is located in the FC 5032 Removable Storage Unit.</p>

Failing Items

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00871	<p>FI00871 indicates that the attached tape device is the failing item.</p> <ul style="list-style-type: none"> • 3590 model Exx – External 1/2 cartridge tape drive; refer to the device Maintenance Information manual to determine the part number(s) to replace. • 6381 – Internal 1/4 inch cartridge drive with QIC-2GB (DC) on the door. <ul style="list-style-type: none"> – For FC 5072, 5073, 5077 expansion towers use P/N 21H7658. – For all other towers use P/N 59H2742. • 6382 – Internal 1/4 inch cartridge drive with QIC-4GB (DC) on the door. <ul style="list-style-type: none"> – For system model 270 and 820 system unit use P/N 04N2564. – For system model 830, 840, SB2, and SB3 system unit use P/N 97H7331. – For FC 5072, 5073, 5077 expansion towers use P/N 21H7019. – For FC 5065, 5074, 5079 expansion towers use P/N 97H7331. – For all other towers use P/N 59H3745. • 6383 - Internal 1/4 Inch cartridge drive with MLR1-S on the front cover. <ul style="list-style-type: none"> – For system model 270 and 820 system unit use P/N 04N2564. – For system model 830, 840, SB2, and SB3 system unit use P/N 24L1064. – For FC 5072, 5073, 5077 expansion towers use P/N 97H7717. – For FC 5065, 5074, 5079 expansion towers use P/N 24L1064. – For all other towers use P/N 59H4533. • 6386 – Internal 1/4 inch cartridge drive with MLR3 on the front cover, use P/N 24L1065 if in a FC 5065 expansion tower, otherwise use P/N 59H4130. <ul style="list-style-type: none"> – For system model 270 and 820 system unit use P/N 04N2566. – For system model 830, 840, SB2, and SB3 system unit use P/N 24L1065. – For FC 5072, 5073, 5077 expansion towers use P/N 97H7528. – For FC 5065, 5074, 5079 expansion towers use P/N 24L1065. – For all other towers use P/N 59H4130. • 7207 model 122 – External 1/4 inch cartridge drive with QIC-4GB-DC on the door, PN 59H4434. • 7208 model 342 – External 8mm tape drive; refer to the device service information to determine the Part Number(s) to replace. • 9348 – External 1/2 inch reel tape unit. <p>Is one of the following status codes displayed anywhere on the 9348 control panel? (x = any number)</p> <ul style="list-style-type: none"> – Exxx – Fxxx – ***xx – ***** <p>No Yes</p> <p>↓ Use the "Status Codes" section of the 9348 Service Information to determine the failing items.</p> <p>Refer to the 9348 Service Information and use the "Running Diagnostic Tests" procedure to run Diagnostic Test 1. If the test fails, use the 9348 Service Information to determine the failing items.</p> <ul style="list-style-type: none"> • Other device type <p>Refer to the device Service Information to determine the part number(s) that need to be replaced.</p>

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00872	<p>FI00872 indicates that the interface is the failing item.</p> <ul style="list-style-type: none"> • Internal Device See "FI01140" on page 558. • External device See "EXTSCSI" on page 571.
FI00880	<p>FI00880 indicates that a terminating plug on the device bus to this IOP is the failing item. Note: If the unit is a 9427, an internal terminating plug is used (see the service information for the specific device).</p> <p>The terminators for a 636x tape unit are located in the FC 5032 Removable Media Storage Unit.</p> <p>The following list shows the possible failing items:</p> <ul style="list-style-type: none"> • Terminating plug for 2440 Tape Unit—part 79X3795 • Terminating plug for 3490, 3570, 3590, and 7208 Model 342 Tape Units—part 61G8324 • SCSI differential terminating plug for 3995 AS/400 Optical Library Dataserver—part 79X3795 • SCSI single-ended terminating plug for 3995 AS/400 Optical Library Dataserver C4x—part 34H5608 • Terminator for 636x Tape Unit—part 21F8890 and part 72X5631 • Terminator for 637x, 638x, and 6390 Tape Units—Terminator is part of the backplane or signal cable. Use the IOP type and see the symbolic FRU "DEVTERM" on page 568 to determine the correct part. • Terminating plug for 63A0 Tape Unit—see device documentation • Terminating plug for 7208 Model 002 Tape Drive—part 91F0721 • Terminating plug for 7208 Model 012 Tape Drive—part 46G2599 • Terminating plug for 7208 Model 222 Tape Drive—part 46G2599 • Terminating plug for 7208 Model 232 Tape Unit—part 79X3795 • Terminating plug for 7208 Model 234 Tape Unit—part 79X3795 • Terminating plug for 9348 Tape Unit—part 79X3795

Failing Items

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI00882	<p>FI00882 indicates that the addressed unit is the failing item.</p> <p>Determine the address and type of the failing unit (see "System Reference Code (SRC) Record" in the <i>AS/400 Service Functions</i> information).</p> <p>If one of the following device types is the failing item, see the service information for the device model installed on the system: • 2440 • 3490 • 3570 • 3590 • 3995 • 63A0 • 7208 • 9347 • 9348 • 9427</p> <p>If the tape unit being used is in the FC 5032 Removable Storage Unit, the failing item is the 636x Tape Unit.</p> <p>See "Removable Storage Unit (FC 5032)" in the <i>FC 504x Problem Analysis and Repair and Parts</i> information.</p> <p>Note: The FC 5032 DSE module connects tape units as follows:</p> <ul style="list-style-type: none"> • Tape units in the top 5032 locations (positions 1 and 2) use the top external cable connector. • Tape units in the bottom 5032 locations (positions 3 and 4) use the bottom external cable connector. <p>A tape unit to the left or right of the tape unit being used (in position 1 or 2 or in position 3 or 4) may be causing the failure.</p> <p>A tape unit above or below the tape unit being used is <i>not</i> a probable cause of the failure because it is attached to a different internal FC 5032 DSE I/O bus and, as described above, uses the other external signal cable.</p>
FI00883	<p>FI00883 indicates that a unit attached to the same IOP, other than the addressed unit identified by FI00882, is the failing item.</p>
FI00884	<p>FI00884 indicates that any unit attached to the IOP may be the failing item.</p> <p>See FI00882 for the list of possible units.</p>
FI01040	<p>FI01040 indicates that you have an OptiConnect/400 system, and the error is on an AS/400 system that is connected to it.</p>
FI01101	<p>FI01101 indicates that the addressed IOA card on the I/O processor is the failing item.</p> <p>Perform the following:</p> <ol style="list-style-type: none"> 1. Determine the address of the IOA card (see "SRC Address Formats" on page 878). 2. Determine the location of the IOA card (see "Expansion Tower Locations and Addresses" on page 687). 3. Exchange the failing device. Use the device type to determine the part.
FI01103, FI01104	<p>FI01103 and FI01104 indicate that an attached IOA card is the failing item.</p> <p>Perform "BUS-PIP5" on page 265 to isolate the failing IOA.</p>

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI01105	<p>FI01105 indicates that the addressed storage device is the failing item.</p> <p>Perform the following:</p> <ol style="list-style-type: none"> Is the device location information available in the Service Action Log? <ul style="list-style-type: none"> No Yes ↓ Exchange the failing item. See "Recovery Procedures" on page 837. <li style="padding-left: 40px;">This ends the procedure. Find the IOP address and the device address (see "SRC Address Formats" on page 878). To determine the location of the I/O processor card, see "Expansion Tower Locations and Addresses" on page 687 and find the diagram of the system unit or the expansion unit. Then, find: <ul style="list-style-type: none"> • The IOP card location identified by the direct select address. • The addressed storage device location identified by the device address. Exchange the failing device. Use the device type to determine the part.
FI01106	<p>FI01106 indicates that a storage device other than the addressed storage device is the failing item.</p> <p>See FI01105 to find the addressed device. The failing item could be any device with the same IOP address and I/O bus number but with a different device unit number.</p> <p>If the reference code that called out this FI does not have a problem analysis procedure, perform "SDIOP-PIP16" on page 423 to isolate the possible failing device.</p>
FI01107	<p>FI01107 indicates that any storage device attached to the I/O bus of this IOP may be the failing item.</p> <p>Perform the following:</p> <ol style="list-style-type: none"> Find the IOP address (see "SRC Address Formats" on page 878). To determine the location of the I/O processor card, see "Expansion Tower Locations and Addresses" on page 687. <p>The unit reference code indicates the I/O bus that has the problem:</p> <ul style="list-style-type: none"> • URC 3020, 3100 —I/O Bus 0 • URC 3021, 3101 —I/O Bus 1 • URC 3022, 3102 —I/O Bus 2 • Any Other URC—Any I/O bus on the I/O card See "Expansion Tower Locations and Addresses" on page 687 and find the diagram of the system unit or the expansion unit and find: <ul style="list-style-type: none"> • The IOP card location identified by the direct select address. • All the storage devices on the same I/O bus. <li style="padding-left: 20px;">Note: The I/O bus number is the first character of the device unit address. Exchange the failing device. Use the device type to determine the part: <p>If the reference code that called out this FI does not have a problem analysis procedure, perform "SDIOP-PIP16" on page 423 to isolate the possible failing device.</p>
FI01108	<p>FI01108 indicates that the I/O (SCSI) bus or power cable is the failing item.</p> <p>See FI01140 and FI01141.</p>
FI01109	<p>See the symbolic FRU "BACKPLN" on page 560.</p>
FI01110	<p>FI01110 indicates that the diskette unit is the failing item.</p> <p>Use the diskette device type to determine the part.</p>

Failing Items

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI01112	<p>FI01112 indicates that the active IOP is the failing item.</p> <p>Perform the following:</p> <ol style="list-style-type: none"> 1. Find the IOP address (see "SRC Address Formats" on page 878). 2. To determine the location of the I/O processor card, see "Expansion Tower Locations and Addresses" on page 687. 3. Use the IOP type to determine the part.
FI01117	<p>FI01117 indicates that any IOA, card, cable, or device attached to the IOP may be the failing item.</p> <ol style="list-style-type: none"> 1. Find the IOP address (see "SRC Address Formats" on page 878). 2. To determine the location of the I/O processor card, see "Expansion Tower Locations and Addresses" on page 687. 3. Identify the IOAs, cards, cables, and devices attached to the IOP found in the preceding steps. 4. Exchange the IOAs, cards, cables, and devices attached to the IOP one at a time until you have corrected the problem.
FI01119	<p>See the symbolic FRU "BACKPLN" on page 560.</p>
FI01121	<p>FI01121 indicates that the diskette unit power supply is the failing item.</p> <p>Use the diskette device type to determine the part(s):</p> <ul style="list-style-type: none"> • 6135 External power supply—part 87G4523 • 9331 Internal power supply—part 74G8535 <p>Power cable assembly—part 87G1463 LED switch and cable assembly—part 74G8572</p>
FI01130	<p>FI01130 indicates that the disk drive and logic card is the failing item.</p> <p>Find the disk unit type number in the "Type, Model, and Part Number List" on page 750 to determine the part number.</p>
FI01131	<p>FI01131 indicates that the disk drive logic card is the failing item.</p> <p>Find the disk unit type number in the "Type, Model, and Part Number List" on page 750 to determine the part number.</p>
FI01132	<p>FI01132 indicates that the disk unit tray is the failing item.</p> <p>Use the symbolic FRU "DISKTRY" on page 570 to determine the part number.</p>
FI01140	<p>FI01140 indicates that the I/O bus cable is the failing item.</p> <p>Perform the following:</p> <ol style="list-style-type: none"> 1. Are there external devices attached? No Yes ↓ See "EXTSCSI" on page 571. 2. Find the IOP address (see "SRC Address Formats" on page 878). 3. To determine the location of the I/O processor card, see "Expansion Tower Locations and Addresses" on page 687. 4. Exchange the failing item associated with the IOP address. <p>Notes:</p> <ol style="list-style-type: none"> a. To find the I/O bus cables, see "Expansion Tower Locations and Addresses" on page 687. b. Any of the I/O cables or backplanes between the IOA and the device could be the failing item. See "Power and Signal Cables" on page 718.

Failing Item Code	Description/Action If only a type number is listed, go to the "Type, Model, and Part Number List" on page 750 to determine the part number.
FI01141	<p>FI01141 indicates that a loss of power to an IOP, to an internal device, or to an external device may have occurred.</p> <ol style="list-style-type: none"> Are 0000 xxxx, 1xxx xxxx, or A6xx 698x SRCs displayed on the control panel? No Yes ↓ Go to "Chapter 2. Unit Reference Codes" on page 17 and use the SRC displayed on the control panel. Did the SRC that directed you to this FI code involve an externally attached device or an IOP with an externally attached device? No Yes ↓ Verify that there is no obvious problem with power to the device. If you suspect a power problem with the device, go to the service information for that external device. The power supply cables or connections to internal disk units, tape units, diskette units, or optical storage units may be the failing item. <ul style="list-style-type: none"> For cable information, see "Expansion Tower Locations and Addresses" on page 687. For part numbers, see "Parts Assemblies" on page 761.
FI01201, FI01202, FI01203	FI01201 through FI01203 indicate that the Licensed Internal Code module AJDG301 is the failing item.
FI02092	See FI00092
FI02112	<p>FI02112 indicates that the addressed storage device is the failing item.</p> <p>Perform the following:</p> <ol style="list-style-type: none"> Is the device location information available in the Service Action Log? No Yes ↓ Exchange the failing item. See "Recovery Procedures" on page 837. This ends the procedure. Find the IOP address and the device address (see "SRC Address Formats" on page 878). To determine the location of the I/O processor card, see "Expansion Tower Locations and Addresses" on page 687 and find the diagram of the system unit or the expansion unit. Then, find: <ul style="list-style-type: none"> The IOP card location identified by the direct select address. The addressed storage device location identified by the device address. Exchange the failing device. Use the device type to determine the part.

Symbolic FRUs

ACMODUL

An AC module may be failing.

Perform the following to determine the part number for the failing AC module:

- Is SRC 1xxx 00AC displayed?
Yes No
↓ Go to step 4 on page 560 of this procedure.
- Are you working on a FC 5033,5034,5035 or 5077 frame?
No Yes

Symbolic FRUs

↓ Re-IPL the entire system to restore resources.

If 00AC SRC prevails after the IPL, then return here and continue with the next step.

3. On the system unit, the 00AC reference code can be caused by an SPCN frame-to-frame cable problem. This usually occurs between the system unit and the Base I/O Tower. See "FI00235" on page 545 in the Failing Item (FI) Code Table for a parts list. Return here and continue with the next step of this procedure if the problem is not resolved.
4. The failing AC module is on a secondary expansion unit or base I/O unit.
 - UPS Base Unit for FC 5033, 5034, or 5035 – part 44H7784
 - AC Module FC 5071, 5073, 5077, 5081, 5083 – part 21H7697
 - AC Module all other FC 5xxx – part 87G6300

This ends the procedure.

AS4NTDD

The Windows NT Server Application Processor device driver may be causing the problem. Refer to the *IBM AS/400 Integration for Windows Server -- Setup*, SC41-5439-03 book, or contact your next level of support for assistance.

This ends the procedure.

BACKPLN

A backplane or a connection to the backplane may be failing. Before replacing any parts, the connections to the backplane should be verified. The following steps identify which backplane may be failing. Part numbers are listed so that the backplane can be replaced in the event that reseating the connections does not solve the problem.

Attention: Disconnecting or removing the type 2620 or type 2628 cryptographic I/O processor causes the loss of the master encryption key. Read "Important Cryptographic I/O Processor Information" on page 884 before disconnecting or removing the cryptographic I/O processor.

Perform the following:

1. Determine the location of the device. Use the location information in the Service Action Log if it is available. If no location information for the device is available, use the location information for the I/O card instead. If no location information is available for either the device or the I/O card, find the address of the device or I/O card. See "SRC Address Formats" on page 878. Use the address to find the location. See "Expansion Tower Locations and Addresses" on page 687.
2. Determine the system model number:
 - Select manual mode on the control panel and display function 20-3. Characters 2 through 4 of function 20-3 contain the system model number.
3. Is the device located in the FC 503x migrated tower base unit or FC 503x expansion unit?

No Yes

↓ Use Power and Signal Cables to locate the device, cable, and backplane. Any backplane connection the device or I/O Processor may be the cause of the problem. For backplane part numbers see "Type, Model,

and Part Number List” on page 750. Exchange the failing item (see “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

4. Is the device located in a FC 507x expansion tower?

No Yes

↓

The system unit expansion tower backplane or storage expansion unit backplane may be failing.

System Unit Expansion Tower Backplane

- FC 5072 – part 86G7633
- FC 5073 – part 90H6425
- FC 5077 – part 21H7465

Storage Expansion Unit Backplane

- FC 5052 Locations K1 through K8 – part 16G6496
- FC 5052 Locations K9 through K16 – part 86G7872
- FC 5055 Locations K1 through K8 – part 21H7750
- FC 5057 Locations K1 through K8, FC 5057 and FC 5058 Locations K9 through K16 – part 21H6940
- FC 5058 Locations K1 through K8 – part 21H6938

Exchange the failing item (see “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

5. Is the device located in a FC 508x expansion tower?

No Yes

↓

The storage expansion tower backplane or storage expansion unit backplane may be failing.

System Expansion Tower Backplane

- FC 5082 – part 87G4357
- FC 5083 – part 90H6426

Storage Expansion Unit Backplane (Locations K1 through K16)

- FC 5052 Locations K1 through K8 — part 16G6496
- FC 5052 Locations K9 through K16 – part 86G7872
- FC 5057 Locations K1 through K8, FC 5057 and FC 5058 Locations K9 through K16 – part 21H6940
- FC 5058 Locations K1 through K8 – part 21H6938

Upper Backplane

- Locations 09C, 11C, 13C, 15C only – part 87G4362

Exchange the failing item (see “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

6. Is the device located in the FC 5065 or FC 5066 expansion tower?

Symbolic FRUs

No Yes

- ↓ The following may be failing:
- Tower Card Assembly-CB1
See "TWRCARD" on page 582.
 - Device Board-DB1 (Locations D01 – D05, D11 – D15, D21 – D25)
Use part number 24L1029. See "FC 5065 or FC 5066 Backplanes – DB1 and DB2" on page 600 to replace the board.
 - Device Board-DB2 (Locations D06 – D10, D16 – D20, D26 – D30)
Use part number 24L1029. See "FC 5065 or FC 5066 Backplanes – DB1 and DB2" on page 600 to replace the board.
 - Device Board-DB3 (Locations D31 – D40, D41, D42, D46 – D50)
Use part number 24L0892. See "FC 5065 or FC 5066 Backplanes – DB3" on page 601 to replace the board.

This ends the procedure.

7. If the FC 504x system unit expansion rack is a possible failing item, use part 74F1543.

Exchange the failing item (see "Chapter 4. Removal and Installation Procedures" on page 593).

This ends the procedure.

BKSPCN

An SPCN card may be failing. The SPCN card may be part of the AC Module in some parts of the system. See "Chapter 4. Removal and Installation Procedures" on page 593 before exchanging BKSPCN. The failing SPCN card is in a secondary expansion unit or base I/O unit. Check the following list to determine the part number:

- For FC 5072 and 5082, the SPCN card is part of the ACMODUL. The part number is 87G6300.
- For FC 5073, 5083, and 9251 Base I/O, the SPCN card is part of the ACMODUL. The part number is 21H7697.

CACHBAT

The cache battery pack may be failing. Use the cache battery pack location information in the Service Action Log if it is available. If the location is not available, find the address of the storage IOA. See "SRC Address Formats" on page 878. Use the address to find the location. See "Expansion Tower Locations and Addresses" on page 687

Using the type number of the storage IOA, go to "Type, Model, and Part Number List" on page 750 to determine the cache battery pack part number.

Power the system down normally prior to replacing the cache battery pack.

To exchange the cache battery pack, see "Type 2740, 2748 Card Cache Battery Pack" on page 622.

This ends the procedure.

CACHE

The cache adapter card on the IOP or IOA may be failing.

- For the 2726/2741 IOA, the failing item is the 4010 cache adapter card (part number 44H6330).
- For the 6502 IOP, the failing item is the 6503 cache adapter card (part number 85F7214).
- For the 6512/6532/6533/671A IOP, the failing item is the 4700 cache adapter card (part number 86G8149).
- For the 2740 and 2748 IOAs, the cache adapter card is not a removable FRU. Return to the FRU list to exchange other items in the failing item list.

Exchange the failing item (see “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

CBLALL

A power cable may be the failing item.

Note: When there is a location and part number displayed on the Control Panel of a System or Expansion Tower, then you are to replace that FRU first.

Perform the following to determine the part number for the failing power supply:

1. Is the SRC 1xxx 2201 or 2301?

No Yes

↓ The failing item is the power cables, exchange the following parts one at a time:

- Base backplane power cable
PWR3A if installed – part 44H7809
PWR3B if installed – part 44H7825
- Tape/Optical/Disk Unit power cable
PWR1B if installed – part 44H7808
PWR1C if installed – part 44H8337
- Disk Unit BACKPL5B power cable
PWR8 if installed – part 44H7811
- Disk Unit BACKPL5A to Optical D02 cable
PWR9 if installed – part 44H8271
- Power supply interposer back plane
PWRBUS1A if installed – part 44H8400
PWRBUS1B if installed – part 44H8401

2. Is the SRC 1xxx 2202 or 2302?

No Yes

↓ The failing item is within the power cables. Exchange the following parts one at a time:

- SPD backplane power cable
PWR23A if installed – part 44H7814
- PCI backplane power cable
PWR23B if installed – part 44H7816
- Tape BACKPL4B and Disk Unit BACKPL5B power cable
PWR21 if installed – part 44H7812

Symbolic FRUs

- Disk Unit BACKPL4B power cable
PWR22 if installed – part 44H7815
 - Power supply interposer backplane
PWRBUS1C if installed – part 44H7910
3. Is the SRC 1xxx 2221, 2222, 2223, 2224, 2321, 2322, 2323, or 2324?
- No** **Yes**
- ↓ The failing item is the power cables, exchange the following parts one at a time:
- Panel backplane to base backplane cable
SIG5A if installed – part 44H8017
SIG5B if installed – part 44H8021
 - Panel backplane to power supply
SIG9A if installed – part 44H8016
SIG6B if installed – part 44H8035
SIG6C if installed – part 44H8022
 - Base backplane to expansion PWRBUS1B cable
SIG8A – Part 44H8339 installed (with cover interlock) replace with – part 44H4599 kit.
SIG8A – Part 87G0785 installed (without cover interlock) replace with – part 87G0785.
 - PWRBUS1B – part 44H8401
 - Disk Unit BACKPL4B power cable
PWR21 if installed – part 44H7812
4. Is the SRC 1xxx 2231?
- No** **Yes**
- ↓ The failing item is the signal cables, exchange the following parts one at a time:
- Panel to RPO/MI/UPS signal/SPCN cover cable
SIG9B – Part 44H8338 installed (with cover interlock) replace with – part 44H4598 kit.
SIG9B – Part 87G0784 installed (without cover interlock) replace with – part 87G0784.
 - Interlock jumper – part 44H8340.
5. Is the SRC 1xxx 2232?
- No** **Yes**
- ↓ The failing item is the signal cables, exchange the following parts one at a time:
- Panel to expansion cover cable
SIG8A – Part 44H8339 installed (with cover interlock) replace with – part 44H4599 kit.
SIG8A – Part 87G0785 installed (without cover interlock) replace with – part 87G0785.
 - Interlock jumper – part 44H8340.
6. Is the SRC 1xxx 2311?
- No** **Yes**

- ↓ The failing item is the signal cables, exchange the following parts one at a time:
- Panel to power supply cable
SIG6B if installed -- part 44H8035.
SIG6C if installed -- part 44H8022.
 - Power supply interposer backplane
PWRBUS1A -- part 44H8400.
PWRBUS1B -- part 44H8401.
7. Is the SRC 1xxx 2312, 2313, or 2314?
- No Yes**
- ↓ The failing item is the signal cables, exchange the following parts one at a time:
- Panel to expansion cover cable
SIG8A – Part 44H8339 installed (with cover interlock) replace with – part 44H4599 kit.
SIG8A – Part 87G0785 installed (without cover interlock) replace with – part 87G0785.
 - Power supply interposer backplane
PWRBUS1B – part 44H8401.
8. Is the SRC 0000 4444, CCCC, DDDD, or EEEE?
- No Yes**
- ↓ The failing item is the signal cables, exchange the following parts one at a time:
- Panel to power supply cable
SIG8A – Part 44H8339 installed (with cover interlock) replace with – part 44H4599 kit.
SIG8A – Part 87G0785 installed (without cover interlock) replace with – part 87G0785.
 - Panel backplane to base backplane cable
SIG5A if installed – part 44H8017.
SIG5B if installed – part 44H8021.
 - Panel backplane to power supply
SIG9A if installed – part 44H8016.
SIG6B if installed – part 44H8035.
SIG6C if installed – part 44H8022.
 - Base backplane to expansion PWRBUS1B cable
SIG8A – Part 44H8339 installed (with cover interlock) replace with – part 44H4599 kit.
SIG8A – Part 87G0785 installed (without cover interlock) replace with – part 87G0785.
9. Is the SRC 1xxx 1100, 1101, 1102, 1103, 1104 or 1105?
- No Yes**
- ↓ Exchange the power subframe assembly – part 90H6360.
10. Is the SRC 1xxx 1512, 1522, or 1532?
- No Yes**

Symbolic FRUs

- ↓ Exchange one of the following one at a time:
- The failing item is the SPCN cable, exchange the following – part 97H7477.
 - The failing item is the power distribution card, exchange the following – part 97H7544.

11. Is the SRC 1xxx 4410, 4411, 4412, 4413, 4415, 4416, 4417?

No Yes

- ↓ Exchange one of the following at a time:
- Charger A01 to batteries (T01 through T04) - part 97H7474
 - Charger to Power supply 1, 2 or 3 - part 36L8858

12. Is the SRC 1xxx 00AC, 2612, 302E, 9012, 9013, 90F0, 9231, 9232, 9233, 9235, 9236, 9280, 9281, 9282, C63E, C701, C702 or C703?

No Yes

- ↓ The failing item is the SPCN frame to frame cable. The following list shows the lengths and part numbers of the possible failing items:
- 6.0 meters – part 21F9469
 - 15.0 meters – part 21F9358
 - 30.0 meters – part 21F9359
 - 60.0 meters – part 21F9360
 - 100.0 meters (SPCN optical cable) – part 21F9415
 - SPCN optical adapter – part 90H6287
 - SPCN port cable (frame-to-node) – part 21F9362
 - Frame-to-frame cable – part 87G6235

13. Go to “Starting Point For All Problems” on page 3

This ends the procedure.

CHECK

If the attached device is an external device, do the following before exchanging any parts:

- Ensure that the device is powered on.
- If an interposer is required, make sure that it is connected between the I/O Processor and the SCSI cable.
- Ensure that the SCSI cable is seated correctly, and that there are no bent or damaged pins on the SCSI cable.
- Ensure that a terminating plug is attached to the device end of the SCSI cable.

This ends the procedure.

COMPRES1

The compressed device and the compression IOA are not compatible.

This ends the procedure.

CRYPBAT

The batteries for the IBM 4758 cryptographic adapter card need to be replaced.

Attention: If you remove any of the batteries without first backing up the power with a fresh battery, the data in the card’s protected memory could be lost, which would render the 4758 Adapter card useless and require replacement of the 4758 Adapter card. Because the 4758-023 Adapter card contains 4 batteries, and the Battery Replacement Kit contains only 2 batteries, DO NOT attempt to remove or replace batteries unless you have two Battery Replacement Kits (PN 09J8199). (Individual models of the 4758 PCI Cryptographic Coprocessor family of cards contain either 2 or 4 batteries. For cards that contain 4 batteries, two battery replacement kits must be ordered.) Refer to “Type 4758 Battery Replacement Procedure” on page 626 for additional information.

This ends the procedure.

CTLPNL

A control panel or control panel cable may be failing.

Note: See “Chapter 4. Removal and Installation Procedures” on page 593 before exchanging the CTLPNL.

Exchange the failing expansion control panel:

- For FC 5065 PCI tower – part 24L0946
- For FC 5066 PCI tower – part 24L0962
- For FC 5033, 5034, 5035 I/O tower – part 44H8310
- For FC 5071, 5072, 5073, 5077, 508x – part 17G0574
- For FC 9171 9309 I/O frame – part 17G0573

This ends the procedure.

CVTCARD

The problem is the HSL I/O Adapter component of the the failing item. The failing item is the Tower Card in position C00 of the 503x migrated tower. Refer to the FC 503x Table 28 on page 692 of this document for the location, replacement part name, CCIN and Removal and Installation procedure for this failing item.

This ends the procedure.

DEVICE

The addressed storage device is the failing item. The device is located in the FC 5065 or 5066 expansion tower. Perform the following:

1. Is the device location information available in the Service Action Log?

No	Yes
-----------	------------

↓	Exchange the failing item. See “Chapter 6. Data Recovery Procedures and General System Information” on page 837.
---	--

This ends the procedure.

2. Find the IOP address and the device address (see “SRC Address Formats” on page 878).
3. To determine the location of the I/O processor card, see “Expansion Tower Locations and Addresses” on page 687 and find the diagram of the system unit or the expansion unit. Then, find:
 - The IOP card location identified by the direct select address.
 - The addressed storage device location identified by the device address.

Symbolic FRUs

4. Exchange the failing device. Use the device type to determine the part.

DEVTERM

The device terminating plug may be failing.

Perform the following:

1. Find the IOP type:
 - a. Find the IOP location information in the Service Action Log if it is available. If the location is not available, find the address of the IOP. See "SRC Address Formats" on page 878. Use the address to find the location. See "Expansion Tower Locations and Addresses" on page 687.
 - b. Find the IOP card in the system and read the type number of the card at that location.
2. Use the information in the following list to determine the failing terminating plug:

For IOPs and IOAs that attach external devices:	
IOP/IOA Type	Action
2621	See FI00880 in "Failing Items" on page 539.
2809/2824 with 2718 IOA	For device type 7207, use part 52G9907.
6500, 6501, 6534, 2809/2824 with 2729 IOA	For tape devices, tape libraries, or optical libraries, see FI00880 in "Failing Items" on page 539. For all other device types use part 85F7887.

For IOPs and IOAs that attach internal devices:	
Internal Device Location	Action
Device located in a feature code 503x tower.	The terminator is part of the backplane or cable. The exception is the PCI expansion with no BACKPL4B. If the BACKPL4B is not installed, the terminator for disk units F31 through F35 is cable SIG24C.
Device located in a feature code 507x or 508x tower.	Use part 90H6285. Note: See "System Unit Expansion Tower (FC 5071, 5073) and Storage Expansion Tower (FC5081, 5083) with Storage Expansion Unit (FC 5058)" on page 728 to determine the terminating plug location.
Device located in a FC 5065 expansion tower.	The terminator is integrated into the backplane.

3. Exchange the failing item.

Note: If the terminating plug is located on a backplane, go to "BACKPLN" on page 560. Follow the procedure until the terminating plug is accessible and then remove or exchange the plug.

This ends the procedure.

DISKDRV

The disk drive and logic card may be failing.

Perform the following:

1. Were you sent here from a power SRC (1xxx xxxx)?

No **Yes**

↓ Go to step 7 of this procedure.

2. Is the device location information available in the Service Action Log?

No **Yes**

↓ To exchange the failing item, see "Recovery Procedures" on page 837.

This ends the procedure.

3. Find the IOP address and the device address (see "SRC Address Formats" on page 878).

4. See "Expansion Tower Locations and Addresses" on page 687 and find the diagram of the system unit or the expansion unit and find:
 - The IOP card location identified by the direct select address.
 - The addressed disk location identified by the device address.

- The IOP card location identified by the direct select address.
- The addressed disk location identified by the device address.

5. Is the SRC reported on the control panel?

No **Yes**

↓ See "Hardware SRC Formats" in the *AS/400 Service Functions* information.

The 2 rightmost characters of word 2 define the SRC format. Use the correct SRC format to locate the function containing the characters tttt lmmm, where:

- tttt=Type number
- l=Level
- mmm=Model

Go to step 9 of this procedure.

6. Go to step 8 of this procedure.

7. Use the disk/device unit number called out in the reference code table for this SRC.

Physically locate the disk/device using "Expansion Tower Locations and Addresses" on page 687.

8. Remove the disk unit to determine the part number.

To exchange the disk drive and logic card, see "Recovery Procedures" on page 837.

This ends the procedure.

9. Using the type and level information, go to "Disk Unit Type, Model, and Part Number List" on page 756 to determine the part number. If you do not know the type and level, remove the disk unit to determine the part.

To exchange the disk drive and logic card, see "Recovery Procedures" on page 837.

This ends the procedure.

Symbolic FRUs

DISKIMG

There may be a problem with the Network Server Description (NWSA). First, vary off and then vary back on the Network Server Description (NWSA).

If this does not correct the problem, delete and recreate the Network Server Description (NWSA), or call your next level of support.

This ends the procedure.

DISKTRY

A disk unit tray or a disk unit holder may be failing.

Note: A disk unit holder is used for disk units in FC 503x migrated towers. A disk unit tray is used for disk units in FC 5077 migrated towers and FC 507x and FC 508x expansion towers. For FC 5065 towers, the disk tray is not a separate FRU and this symbolic FRU does not apply.

Perform the following:

1. Were you sent here from a power SRC (1xxx xxxx)?

No **Yes**

↓ Go to step 7 of this procedure.

2. Is the device location information available in the Service Action Log?

No **Yes**

↓ To exchange the failing item, see "Chapter 6. Data Recovery Procedures and General System Information" on page 837. Remove the disk unit to determine the part number.

This ends the procedure.

3. Find the IOP address and the device address (see "SRC Address Formats" on page 878).

4. See "Expansion Tower Locations and Addresses" on page 687, locate the diagram of the migrated tower or the expansion unit, and find:

- The IOP card location that is identified by the direct select address.
- The addressed disk unit location identified by the device address.

5. Is the SRC reported on the control panel?

No **Yes**

↓ See "Hardware SRC Formats" in the *AS/400 Service Functions* information.

The 2 right-most characters of word 2 define the SRC format. Use the correct SRC format to locate the function containing the characters tttt lmmm, where:

- tttt=Type number
- l=Level
- mmm=Model

Go to step 9 of this procedure.

6. Go to step 8 of this procedure.

7. Use the disk/device unit number called out in the reference code table for this SRC.

Physically locate the disk/device using “Expansion Tower Locations and Addresses” on page 687.

8. Remove the disk unit to determine the part number.

To exchange the failing item, see “Chapter 4. Removal and Installation Procedures” on page 593.

This ends the procedure.

9. Using the type and level information, go to “Disk Unit Type, Model, and Part Number List” on page 756 to determine the part number. If you do not know the type and level, remove the disk unit to determine the part number.

To exchange the failing item, see “Chapter 4. Removal and Installation Procedures” on page 593.

This ends the procedure.

DSKUNIT

The disk drive is located in the FC 5065 or 5066 expansion tower. See “DISKDRV” on page 569.

EACODE

An error occurred in the error analysis Licensed Internal Code.

Ask your next level of support for assistance.

This ends the procedure.

EXTREMD

An external removable media storage device may be failing.

See “CHECK” on page 566 for more information prior to removing or replacing any parts. Return here if “CHECK” doesn’t reveal any problems.

Use the device type and refer to the appropriate service documentation for that device. This documentation will help you determine the FRU part numbers and replacement procedures that you are to use during this repair action. If you are unable to locate the documentation for your specific device, then contact your next level of support for assistance.

EXTSCSI

If more than one device is attached, they may have duplicate addresses. See the device documentation for information on setting the device address.

The external signal cable may be failing.

Perform the following:

1. Find the IOP or IOA type:
 - a. Find the IOP or IOA address (see “SRC Address Formats” on page 878).
 - b. See “Expansion Tower Locations and Addresses” on page 687 and find the location of the IOP or IOA card at the IOP or IOA address (direct select address) you just read.
 - c. Find the IOP or IOA card in the system and read the type number of the card at that location.

Symbolic FRUs

- Find the IOP or IOA type, the attached device, the cable length, and the cable part number in the following list.

Note: Verify that the part number in the list is the same as the part number on the cable.

IOP or IOA Type	Device	Lengths	Part Number
2621	All except 9427	4.0 meters	6495268
		12.0 meters	6495269
		20.0 meters	21F4980
	9427	2.0 meters	21F9043
		4.0 meters	21F9044
		6.0 meters	56F0382
		20.0 meters	21F9045
	6500	9337	2.0 meters	21F9043
4.0 meters			21F9044
6.0 meters			56F0382
20.0 meters			21F9045
6501	9337	1.5 meters	21F9046
		4.0 meters	21F9047
		6.0 meters	56F0381
		24.0 meters	21F9048
	3490, 3490/Exx, 3590	2.8 meters	05H4647
		4.5 meters	05H4648
		12.0 meters	05H4649
		18.0 meters	05H4650
		25.0 meters	05H4651
	63A0		See device documentation to determine cable Part Number(s)
	3490/Fxx, 3570	0.5 meters	49G6456
		4.5 meters	49G6457
		12.0 meters	49G6458
		18.0 meters	49G6459

IOP or IOA Type Type	Device	Lengths	Part Number
6534, 2729	3490, 3490/Exx, 3590	2.8 meters	05H4647
		4.5 meters	05H4648
		12.0 meters	05H4649
		18.0 meters	05H4650
		25.0 meters	05H4651
	3490/Fxx, 3570, 9427, 7208/342	0.5 meters	49G6456
		4.5 meters	49G6457
		12.0 meters	49G6458
		18.0 meters	49G6459
	63A0		See device documentation to determine cable Part Number(s)
	7208/012, 7208/222	1.5 meters	52G0174
		4.0 meters	59H3462
		12.0 meters	59H3463
	7208/232, 7208/234, 9348	0.5 meters	06H6037
		4.0 meters	59H3460
12.0 meters		59H3461	
3995	12.0 meters	59H3461	
2718	7207/122, 7210/020	2.4 meters	67G1260

Notes:

- a. All cables for the type 6501 IOP, with the exception of 9337 cables, must include an interposer, part 05H3834 on the IOP end of the cable.
- b. All cables for the 9427 tape library must include an interposer, part 05H3834, on the device end of the cable.
- c. If the tape unit being used is in the FC 5032 Removable Storage Unit, the failing item may also be one of the following:
 - DSE module—part 21F8890
 - Cable carrier—part 21F8872

The DSE module internal to the FC 5032 Removable Storage Unit terminates each external signal cable. No terminating plug is required. The DSE module connects tape units as follows:

- Tape units in the top 5032 locations (positions 1 and 2) use the top external cable connector.
- Tape units in the bottom 5032 locations (positions 3 and 4) use the bottom external cable connector.

This ends the procedure.

INTRLCK

An interlock failure may have occurred.

Note: Some expansion units do not have interlocks. If the expansion tower does not have an interlock, proceed to the next FRU.

Symbolic FRUs

1. Refer to the message associated with the SRC to determine if the problem occurred on the system unit or the internal secondary frame.

Exchange the following parts by replacing the installed cable with a cable or appropriate cable kit:

- Part 44H8338 -- replace with cable kit 44H4598
- Part 44H8339 -- replace with cable kit 44H4599
- Part 87G0784 -- replace with part 87G0784
- Part 87G0785 -- replace with part 87G0785

If the problem still persists, replace the SPCN panel card. For the correct part, see "SPNLCD" on page 581.

This ends the procedure.

IOP

Replace the I/O Processor. Use the I/O Processor location information in the Service Action Log if it is available. If the location is not available, find the address of the I/O Processor. See "SRC Address Formats" on page 878. Use the address to find the location. See "Expansion Tower Locations and Addresses" on page 687.

This ends the procedure.

LBSADP1

The failing item is the Local Bus Adapter card in a FC 5077 SPD migrated tower.

- The card position is **S09** and the card type is **2696**.
- Linked to HSL port 0 on the HSL (SI) Interposer card in location S08.
- See the "FC 5077 – Migrated Tower Base Unit" on page 710 locations diagram and the associated Table 33 on page 710 to determine the CCIN, part number and removal and installation procedure for the Local Bus Adapter Card.

LBSADP2

The failing item is the Local Bus Adapter card in a FC 5077 SPD migrated tower.

- The card position is **S07** and the card type is **2695**.
- Linked to HSL port 1 on the HSL (SI) Interposer card in location S08.
- See the "FC 5077 – Migrated Tower Base Unit" on page 710 locations diagram and the associated Table 33 on page 710 to determine the CCIN, part number and removal and installation procedure for the Local Bus Adapter Card.

LBSADP3

The failing item is the Local Bus Adapter card in a FC 5077 SPD migrated tower.

- The card position is **S10** and the card type is **2695**.
- Linked to HSL port 0 on the HSL (SI) Interposer card in location S08 through the HSL I/O adapter card in location S09; pass-through linked to HSL port 1 on the HSL (SI) Interposer card in location S08 through the HSL I/O adapter card in location S07.
- See the "FC 5077 – Migrated Tower Base Unit" on page 710 locations diagram and the associated Table 33 on page 710 to determine the CCIN, part number and removal and installation procedure for the Local Bus Adapter Card.

LBSADP4

The failing item is the Local Bus Adapter card in a FC 503x SPD migrated tower PCI expansion unit.

- The card position is E00 and the card type is 2826.
- See the “FC 5034, FC 5035 – PCI Expansion Unit” on page 695 locations diagram and the associated Table 29 on page 695 to determine the CCIN, part number and removal and installation procedure for the Local Bus Adapter Card.

LBSADP5

The failing item is the Local Bus Adapter card in a 503x SPD migrated tower SPD expansion unit.

- The card position is **S07** and the card type is **2735**.
- See the “FC 5034, FC 5035 – SPD Expansion Unit” on page 700 locations diagram and the associated Table 30 on page 701 to determine the CCIN, part number and removal and installation procedure for the Local Bus Adapter Card.

LBUSADP

Ward owner/user —

Use HSM, the System Configuration Listing or visually inspect the SPD migrated tower to determine the feature code of the tower. Record the tower’s feature code.

Use the migrated tower feature code to determine which symbolic FRU to go to:

- For FC 5033, FC 5034, and FC 5035 Migrated Towers go to symbolic FRU “LBUSADP-503x”.
- For FC 5077 Migrated Towers go to symbolic FRU “LBUSADP-5077” .

LBUSADP-503x

The local bus adapter is the failing item.

For PCI expansion units the card position is **E00** and the card type is **2826**. See the “FC 5034, FC 5035 – PCI Expansion Unit” on page 695 and the associated Table 29 on page 695 to determine the CCIN, part number and removal and installation procedure for the Local Bus Adapter Card.

For SPD expansion units the failing item is a type **2735** in position **S07**. See the “FC 5034, FC 5035 – SPD Expansion Unit” on page 700 and the associated Table 30 on page 701 to determine the removal and installation procedure for the Local Bus Adapter Card.

LBUSADP-5077

The local bus adapter is the failing item.

Use the **BBBBcbb** format of the Direct Select Address (DSA) in word 7 of the SRC to determine the failing bus number. The failing bus number is in hexadecimal format. Convert the failing bus number into decimal format so that it matches the bus numbers that are referenced in the HSM screens.

Is the bus number you determined less than 4 (decimal) or is the bus number greater than 23 (decimal)?

Symbolic FRUs

If **YES** then the failing Local Bus Adapter card is not identified in the SRC. The failing Local Bus Adapter card is one of three Local Bus Adapter cards which may be installed. Exchange symbolic FRUs "LBSADP1" on page 574, "LBSADP2" on page 574, and "LBSADP3" on page 574 one at a time for this symbolic FRU. **This ends the procedure.**

If **NO** then use the following list to determine the location and type of the failing card:

- Bus number and corresponding card position and card type:
 - Buses 4 - 10 (decimal) (or 0004 - 000A in hex as in the DSA) = Location **S09** and card type **2696**, linked to HSL port 0 on the HSL (SI) Interposer card in location S08.
 - Buses 11 - 16 (decimal) (or 000B - 0010 in hex as in the DSA) = Location **S07** and card type **2695**, linked to HSL port 1 on the HSL (SI) Interposer card in location S08.
 - Buses 17 - 22 (decimal) (or 0011 - 0016 in hex as in the DSA) = Location **S10** and card type **2695**, linked to HSL port 0 on the HSL (SI) Interposer card in location S08 through the HSL I/O adapter card in S09; pass-through linked to HSL port 1 on the HSL (SI) Interposer card in location S08 through the HSL I/O adapter card in S07.

See the "FC 5077 – Migrated Tower Base Unit" on page 710 and the associated *FRU Positions and Failing Items* to determine the removal and installation procedure for the Local Bus Adapter Card.

LPARCFG

There is a configuration problem with a logical partition.

Have the customer check processor and memory allocations to the secondary partitions. The customer must ensure there are enough functioning processor and memory resources in the system for all the partitions. Be aware that processor or memory resources that failed during system IPL could have caused the IPL problem in the secondary partition.

Have the customer check the bus and I/O processor allocations for the secondary partition. The customer must ensure that the partition has load source and console I/O resources.

Have the customer check the IPL mode of the Primary partition and the failing secondary partition. If the Primary partition is IPL'd in mode 'C' then secondary partitions can only be IPL'd in mode 'C'. If that is the problem, then re-IPL the Primary partition in either 'A' or 'B' mode. Then the secondary partition can IPL in any mode.

For further assistance the customer should contact their software service provider, or visit the IBM web page at <http://www.as400.ibm.com/lpar> for additional support direction.

This ends the procedure.

LPARSUP

There is an IPL or MSD problem with a secondary partition.

During the IPL or mainstore dump of a secondary partition, a complex problem was detected. The Primary partition's SAL has to be searched or the secondary partition's SRC history list has to be analyzed in sequence. Contact your next level of hardware support.

This ends the procedure.

MEMORY

The memory module may be the failing item.

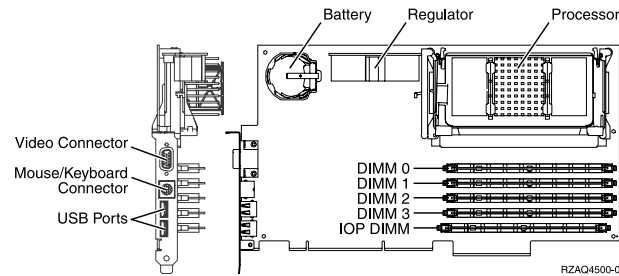


Figure 21. Locations of DIMM 0, DIMM 1, DIMM 2 and DIMM 3 on 2890 Integrated Netfinity Server (INS) card.

Feature	Size	Part Number
2895	128 MB	29L0955
2896	256 MB	29L0956
2897	1 GB	29L0957

This ends the procedure.

NOFRUS

No failing items are identified for the reference code.

This ends the procedure.

NTDEVDR

The Windows NT Server device driver may be causing the problem. Refer to the *IBM AS/400 Integration for Windows Server -- Setup, SC41-5439-03* book, or contact your next level of support for assistance.

This ends the procedure.

Symbolic FRUs

NTLANDD

The Windows NT Server Virtual LAN device driver may be causing the problem. Refer to the *IBM AS/400 Integration for Windows Server -- Setup*, SC41-5439-03 book, or contact your next level of support for assistance.

This ends the procedure.

NTOPSYS

The Windows NT Server Operating System may be causing the problem. Refer to the *IBM AS/400 Integration for Windows Server -- Setup*, SC41-5439-03 book, or contact your next level of support for assistance.

This ends the procedure.

NTUSER

The Windows NT Server user problem may be caused by:

- user-initiated action
- a Windows NT user application
- no keyboard or mouse attached to the Integrated Netfinity Server

Refer to the *IBM AS/400 Integration for Windows Server -- Setup*, SC41-5439-03 book, or contact your next level of support for assistance.

This ends the procedure.

PCIBUS

The failing item is any PCI adapter controlled by the I/O processor indicated either in the Direct Select Address of the SRC or in the location given by the SAL entry. Perform "BUS-PIP5" on page 265 to determine which IOA is the failing item.

If "BUS-PIP5" on page 265 does not identify a failing IOA then the failing item is the card enclosure or backplane of the IOP.

PLUS

The list of possible failing items that are displayed on-line is not complete. There is not enough space to display all of the failing items. See the complete list of possible failing items in the appropriate unit reference code table in "Chapter 2. Unit Reference Codes" on page 17.

This ends the procedure.

QSYSOPR

For more information, look in the System Operator message queue for a message with the same date/time. Perform any actions defined in the message.

This ends the procedure.

RMDEV

A removable media power regulator or device is failing.

The last two digits of the reference code identify the failing device. Consult the table below.

Reference Code	Failing Device
xx16	D01
xx17	D02
xx1C	D03
xx1F	D04

1. See "Expansion Tower Locations and Addresses" on page 687 to determine where the failing device is located and to identify what type of device it is.
2. Is the SRC 1xxx 6B16, 6B17, 6B1C, 6B1F, 6C16, 6C17, 6C1C or 6C1F?

Yes	No
↓	Go to "Starting Point For All Problems" on page 3.
3. Is the failing device a disk unit?

No	Yes
↓	Go to "DISKTRY" on page 570 to replace the failing device. Return to 6 of this procedure after exchanging the device.
4. Is the failing device an optical storage unit?

No	Yes
↓	The optical storage unit is the failing item. Assume a type number of 632x and go to the "Type, Model, and Part Number List" on page 750 to determine the part number. Return to 6 of this procedure after exchanging the device.
5. The failing device is a magnetic tape unit. Determine the device type by reading the QIC number from the front door of the device. Find the type number in the table below.

QIC or Tape Device	Type Number
QIC 3040	6335
QIC 1000	6379
QIC 2GB	6380, 6381
QIC 4GB	6382
QIC 5010	6385
8mm Tape Device	6390
MLR1-S	6383
MLR3	6386

When you have located the Type Number in the above table, go to "Type, Model, and Part Number List" on page 750 to determine the part number. Return to 6 of this procedure after exchanging the device.

6. Is the SRC 1xxx 6B16, 6B17, 6B1C, 6B1F, 6C16, 6C17, 6C1C or 6C1F displayed?

Yes	No
↓	The regulator you replaced in this procedure is the failing item.

This ends the procedure.
7. Exchange the SPCN card (BKSPCN); see "Chapter 4. Removal and Installation Procedures" on page 593. After exchanging the part, return to this step and continue with the procedure.
 Is the SRC 1xxx 6B16, 6B17, 6B1C, 6B1F, 6C16, 6C17, 6C1C or 6C1F displayed?

Yes	No
------------	-----------

Symbolic FRUs

↓ The SPCN card you replaced in this step is the failing item.

This ends the procedure.

8. Exchange the backplane (BACKPLN).

This ends the procedure.

SIRGCBL

SIRGCBL: High Speed Link (shown as "System Interconnect" on the display) ring cable.

This failing item is an HSL (SI) ring cable, the HSL (SI) ring connections (external or embedded) or an HSL (SI) interposer card in a High Speed Link ring. The ring number may be given in the location field of the SAL decimal format. The ring number is in the left four digits of word 7 of the SRC in hexadecimal format.

The failing item can be connecting:

- The system unit frame and another system unit frame.
- An I/O expansion tower and another I/O expansion tower.
- An I/O expansion tower and an SPD migrated tower.
- On FC 503x migrated towers, an internal ribbon cable connecting the Tower Card in position C00 to the HSL Interposer Card on the inside of the frame behind the HSL ports.
- The HSL (SI) interposer card in a FC 5033, 5034, 5035 or 5077 SPD migrated tower.

Note: On FC 503x migrated towers the HSL Interposer card is located inside the frame behind the HSL ports.

Note: On FC 5077 migrated towers the HSL Interposer card is located in position S08.

- The system unit frame and an I/O expansion tower or SPD migrated tower.

Note: For Model 830/SB2, the external HSL cable ports A0 and A1 (for loop #256) are not on the HSL controller card in position M06. The A0 port is labeled "1" and is located on the HSL I/O adapter card in position C08 of the FC 9074 base I/O tower. Port A1 is located on the system unit frame, under the HSL controller card in position M06. The A1 port is oriented horizontally below a cross member on the frame.

- On Model 830/SB2, an internal ribbon cable which connects the HSL controller card in position M06 to the HSL I/O adapter card in position C08 of the FC 9074 Base I/O tower.
- On model 820, an embedded HSL link in the System Unit Backplane between the HSL controller and the HSL I/O adapter which are both embedded in the System Unit Backplane.
- An internal HSL ribbon cable on a 503x SPD migrated tower.
- On Model 820, an internal ribbon cable which connects the System Unit Backplane in position MB1 to the HSL ports on the frame.
- On model 270, an embedded HSL link in the System Unit Backplane between the HSL controller and the HSL I/O adapter which are both embedded in the System Unit Backplane.

- On Model 270, an internal ribbon cable which connects the System Unit Backplane in position MB1 to the HSL ports on the frame.

SIRGCFG

An invalid configuration was detected on an HSL (SI) loop during IPL.

Word 4 contains a Program Return Code (PRC) which describes the problem detected. The leftmost 4 digits of word 6 in the SRC contains the loop number in hexadecimal format. Convert the loop number to decimal format before comparing it to loop numbers shown in HSM.

To determine the problem, find the PRC in the table below.

Note: The FRU description in the SAL may already contain a message that identifies the problem.

PRC in Word 4 of the SRC	Problem Identified	Corrective Action
0000 0008	SYSTEM SERIAL NUMBER NOT SET	Set the serial number on the system unit
0000 3200	CLUSTERED SYSTEM(S) ON LOOP WITH SPD MIGRATED TOWER	Remove clustered systems from the loop with the migration tower.
0000 3201	CLUSTERED SYSTEMS ON MULTIPLE HSL LOOPS	Ensure all clustered systems are on the same HSL loop.
0000 3202	MULTIPLE SPD MIGRATED TOWERS DETECTED	Only one migration tower is supported on a system. Remove the additional migration towers.
0000 3207	SPD MIGRATED TOWER NOT ON FIRST HSL LOOP	Move the migration tower to the first HSL loop. The first HSL loop is number 256 and attaches to ports A0 and A1 on the HSL (SI) controller card of the system unit.

SPNLCRD

The control panel electronics card may be the failing item.

The part numbers for the failing card are shown below:

- FC 5033, 5034, and 5035 SPCN/panel card – part 04N4441

If a problem still exists in the expansion unit after FRUs in the list have been replaced, replace the appropriate control panel cable:

- Expansion backplane to SPNLCRD cable – part 44H8021
- Power supply to SPNLCRD cable – part 44H8022
- 4-9 pin D shell interface panel to SPNLCRD cable
 - part 44H8338 installed, replace with – part 44H4598 kit
 - part 87G0784 installed, replace with – part 87G0784
- Internal UPS to SPNLCRD cable – part 44H8035
- Internal expansion to SPNLCRD cable
 - part 44H8339 installed, replace with – part 44H4599 kit
 - part 87G0785 installed, replace with – part 87G0785

Symbolic FRUs

- Internal expansion jumper – part 44H8020

See “Expansion Tower Locations and Addresses” on page 687.

This ends the procedure.

STORIOA

The storage IOA may be failing. For some IOPs, the storage IOA is not a separate FRU. In this instance, replace the whole IOP. Use the location information in the Service Action Log if it is available. If the location is not available, find the address. See “SRC Address Formats” on page 878. Use the address to find the location. See “Expansion Tower Locations and Addresses” on page 687.

The 2809, 2824, and 282C IOPs have the following removable storage IOAs: 2718, 2726, 2728, 2729, 2740, 2741, and 2748. For these IOPs, replace the storage IOA.

For all other IOPs, replace the IOP.

This ends the procedure.

SVCDOS

See the *Description/Action* column in the “Chapter 2. Unit Reference Codes” on page 17 for the Unit Reference Code you have.

This ends the procedure.

TWRCARD

An SPCN card may be failing. The SPCN card may be part of the AC Module in some parts of the system expansion.

Note: See “Chapter 4. Removal and Installation Procedures” on page 593 before exchanging the part.

The failing SPCN card is in a secondary expansion unit or base I/O unit.

- For FC 5072 and FC 5082 towers, the SPCN card is part of the ACMODUL – part 87G6300.
- For FC 5073, 5083, and 5077 Base I/O towers, the SPCN card is part of the ACMODUL – part 21H7697.
- For FC 5065 and FC 5066 expansion tower, the SPCN card is part 24L0921.
- For FC 5074 and FC 5079 expansion tower, the SPCN card is part 97H7307.
- For FC 9309 expansion tower the PCC, see *FC 504x Problem Analysis and Repair and Parts*.

This ends the procedure.

UC235

The problem may be that the card (a resource) was removed from the card enclosure without updating the system configuration records.

Note: If the system has OptiConnect/400, verify that the remote system was powered on at the time of the failure.

If a resource was removed from the system without updating the system configuration records, then use Hardware System Manager, Logical Hardware

Resources, System Bus Resources, Non-reporting Resources, and use the remove option to remove the resource from the system configuration records.

This ends the procedure.

UC236

The problem may be that the card (a resource) is not correctly plugged into the card enclosure. Use the location information associated with this filing item in the Service Action Log entry and verify that the card is installed properly.

This ends the procedure.

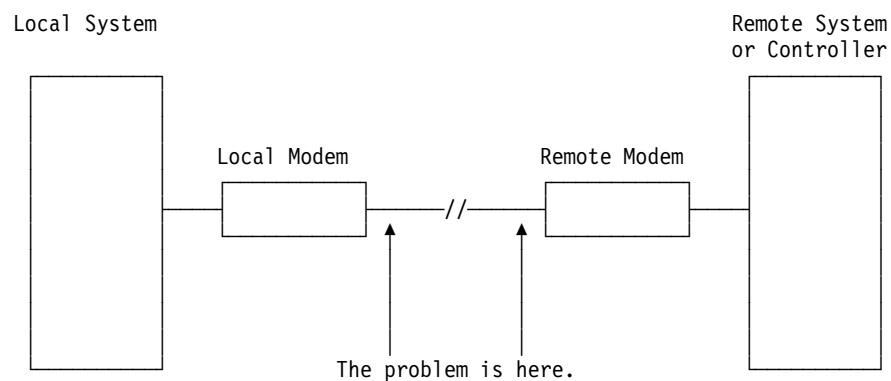
UG3AS

An error has been detected in AS/400 Licensed Internal Code.

Contact your next level of support for possible corrective actions.

This ends the procedure.

UJ0E7



The problem has been isolated to the telephone line equipment that links the local and the remote equipment.

This ends the procedure.

UJ6P3

An error occurred in the IBM Facsimile Support/400 Licensed Program.

Please contact your next level of support for possible corrective actions.

Find additional information on Facsimile Support for OS/400 in the Application System Facsimile Support for OS/400 User's Guide.

This ends the procedure.

UJA34

The line configuration parameter that was identified as a possible problem can be changed by using the WRKLIND command. Determine if the suspected configuration parameter is wrong and change if necessary. Information about commands related to communications can be found in the following manuals:

Symbolic FRUs

- CL Programming, SC41-5721-03
- Communications Configuration, SC41-5401-00

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you use this temporary change.

This ends the procedure.

UJE34

The error message may have been logged from a temporary error that is not caused by equipment failure. This type of error message sometimes contains information about system performance.

See the original system message for cause and recovery information about the error.

UJE35

The configuration parameter that was identified as a possible problem can be verified by displaying the local area network line description with the DSPLIND command.

The line description was created by the CRTLINTRN, the CRTLINETH or the CRTLINDDI command. You may need to review the appropriate command information to determine if the configuration parameter is wrong.

For more information about commands related to communications, see the Programming: Control Language and the Communications Configurations reference topics in the AS/400 Information Center, which is available at <http://publib.boulder.ibm.com/pubs/html/as400/infocenter.htm>

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you use this temporary change.

This ends the procedure.

UJE40

The problem may be at the remote site or on the network media.

Perform the following:

1. Ask the remote site operator to verify the following:
 - The remote equipment is powered on and ready.
 - The configuration values are correct.
 - The local area network cables are securely connected and are not damaged.
2. If the problem continues, run all available diagnostic tests on the remote equipment and perform the repair action specified.

This ends the procedure.

ULNZ3

Communications line problems:

When a workstation is attached to the system through modems, it may fail or lose communication with the system for various lengths of time. This is due to a communications line problem.

Refer to the modem service information to determine how to test the modems and verify that the communications line between the modems is working correctly.

This ends the procedure.

ULNZ4

Independent workstation and SDLC support:

The system considers an independent workstation to be an attached remote system when it is attached using PC Support asynchronous communications on an ASCII workstation controller.

Perform the following:

- See the *ASCII Work Station Reference, SA41-3130-00* information for instructions on how to verify that the remote system (independent workstation) that is attached to the failing port is a supported device.
- See the device hardware maintenance and service information for instructions on how to verify that the device is working correctly.

This ends the procedure.

UNP20

The internal code of the I/O card that detected the error may be defective.

Perform the following:

1. Replace the suspected card.
2. If the failure occurs again, contact your next level of support and report the problem.

This ends the procedure.

UPLF1

The system may not have been able to complete the APPN session initiation due to the number of jobs that were active when the timeout occurred.

The timeout condition could have been caused by a system performance problem. System performance could be impacted by the capacity of the system. System performance can also be impacted by processing requests from other systems in the network.

For capacity planning and system performance information, refer to *LPS: Performance Tools for AS/400, GC41-5055-00*.

This ends the procedure.

UPSUNIT

The UPS may be the failing item.

Note: The AMD in the UPS will be stopped when the UPS is not running on batteries or is charging the batteries on FC 5033, 5034, or 5035.

Symbolic FRUs

Perform the following:

1. Is the SRC or problem on FC 5033, 5034, or 5035 frame?

Yes No

↓ Go to step 13 on page 587 of this procedure.

2. Verify that the SIG7 cable (part 44H8027) is installed.

Was the cable already installed?

No Yes

↓ Go to step 4 of this procedure.

3. Install the SIG7 cable and wait 10 seconds.

Is the SRC still present?

Yes No

↓ **This ends the procedure.**

4. Do you have a SRC 1xxx 2400, 2401, 2402, 2407, or 2413?

No Yes

↓ An incorrect status response was detected during normal operation. Before replacing the UPS, unplug and replug the UPS connector. If the fault clears, continue with step 5 of this procedure to replace the UPS. If the fault does not clear, the problem is in the system unit and you need to refer to "SPNLCRD" on page 581.

5. Do you have a SRC 1xxx 2406?

Yes No

↓ Go to step 10 on page 587 of this procedure.

6. Check the UPS base unit and the UPS transformer connectors for damage or pushed out contacts. Seat the pushed out contacts or replace the unit with the damaged connector.

When damaged connectors or pushed out contacts are not found:

- Reseat the UPS base unit and transformer. Perform the battery test (refer to the "Important UPS Information" on page 684) and re-ipl the system. Then, return here and continue with step 7 of this procedure.

7. Does SRC 1xxx 2406 reoccur?

Yes No

↓ **This ends the procedure.**

8. Replace the UPS base unit – part 44H7784. Perform the battery test (refer to the "Important UPS Information" on page 684 for battery test instructions) and re-IPL the system. Then, return here and continue this procedure.

Does SRC 1xxx 2406 reoccur?

Yes No

↓ **This ends the procedure.**

9. Replace the UPS transformer unit – part 44H7786. Perform the battery test (refer to the "Important UPS Information" on page 684 for battery test instructions) and re-IPL the system. Then, return here and continue with this procedure.

Does SRC 1xxx 2406 reoccur?

Yes No

↓ **This ends the procedure.**

10. Exchange the following parts one at a time: (see “Expansion Tower Locations and Addresses” on page 687 and “Chapter 4. Removal and Installation Procedures” on page 593). After exchanging each part, perform the battery test (refer to the “Important UPS Information” on page 684 for battery test instructions) and re-ipl the system. Then replace the next FRU in the list.

- UPS base unit – part 44H7784 (if not previously replaced)
- UPS unit signal cable SIG7 – part 44H8027
- UPS to power supply ac power cable – part 44H8388 (4x)
- UPS transformer unit – part 44H7786 (if not previously replaced)

11. Do you have a SRC 1xxx 2410?

No Yes

↓ The UPS did not respond to a test request. If replacing the UPS did not clear the fault, the problem may be in the system unit. Refer to “SPNLCRD” on page 581.

12. Were you sent to the UPSUNIT procedure by SRC 1xxx 2403, 2404, or 2405?

No Yes

↓ Even though the UPS has been repaired, when the system is powered on, the old fault was displayed and reported. This fault is latched in the UPS and requires a successful UPS battery test to clear the fault. Refer to “Important UPS Information” on page 684 for further battery test instructions.

13. Do you have a SRC 1xxx 4500, 4501, 4502, 4507, or 4513?

No Yes

↓ An incorrect status response was detected during normal operation. Before calling the UPS provider, unplug and replug the UPS signal cable connector. If the fault clears, contact UPS provider to fix the UPS. If the fault does not clear, the problem is in the system unit and you need to refer to TWRCARD.

14. Do you have a SRC 1xxx 4510?

No Yes

↓ The UPS did not respond to a test request. Call UPS provider for service.

15. Were you sent to the UPSUNIT procedure by SRC 1xxx 4503, 4504, or 4505?

No Yes

↓ Call UPS provider for service. Even though the UPS has been repaired, when the system is powered on, the old fault was displayed and reported. Refer to Important UPS Information for further battery test instructions.

This ends the procedure.

USER

System operator error or user error. See the system operator information.

This ends the procedure.

Symbolic FRUs

UX201

The printer definition table may be causing the problem.

Perform the following:

- See the original system message for cause and recovery information about the error.

This ends the procedure.

UX202

A problem was detected while downloading a device Licensed Internal Code change to the device.

Perform the following:

- See the original system message for cause and recovery information about the error.

This ends the procedure.

UY1Z1

Cable problems:

See the *IBM Technical Information Manual* for information on how to correct cabling problems. Problems that are associated with noise can cause a workstation to fail or lose communication with the system for various lengths of time. A motor or any device that is a source of electrical radiation can cause noise or electrical interference. The following are common causes for noise problems:

- Cables that are located near a source of electrical interference.
- Cables that are loose, damaged, or not correctly connected

This ends the procedure.

UY1Z2

This error occurs if you attempted to activate more workstations than the amount allowed.

Perform one of the following to correct the problem:

- Turn off the power for the workstation that caused the error, or connect the workstation to a different controller.
- Turn off the power for a different workstation that is connected to the same workstation controller.

See the local workstation diagrams for the physical location of workstations.

This ends the procedure.

UY1Z3

This error is caused by a workstation that is connected to the port.

Perform the following:

1. Turn off the power for one workstation on the port, then check if the other workstations operate correctly. Repeat this step for each workstation on the port. The workstation that causes the problem is the one that is turned off when the others are working correctly.

If you did not find the problem, continue to 2.

2. Turn off the power for all workstations on the port. Then turn on one workstation to check if it works when all other workstations are turned off. Repeat this step for each workstation on the port. The workstation that causes the problem is the one that works when all other workstations are turned off.

This ends the procedure.

UY1Z4

An error occurred with the pass-through command between the workstation controller and the workstation.

A failure in the Licensed Internal Code in the workstation or the Licensed Internal Code in the workstation controller causes this type of error.

This ends the procedure.

UY1Z5

The communication between the workstation controller and a workstation was interrupted during an active session.

Possible causes:

- The power for the workstation was turned off, then on.
- A temporary loss of power to the workstation occurred.

This ends the procedure.

Symbolic FRUs

Part 2. FRU Replacement

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Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

Look for the part you came here to replace. Under that part there will be a section with the feature code of the tower you are working on. The procedure will be in that section.

AC Module

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687
- “Parts Assemblies” on page 761

FC 507x and FC 508x

1. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord.
3. Remove the rear cover (see “Covers” on page 638).
4. **DANGER**

Up to 240 V ac is present at the power module connectors when the main power cord is connected to a power source. (RSFTD010)

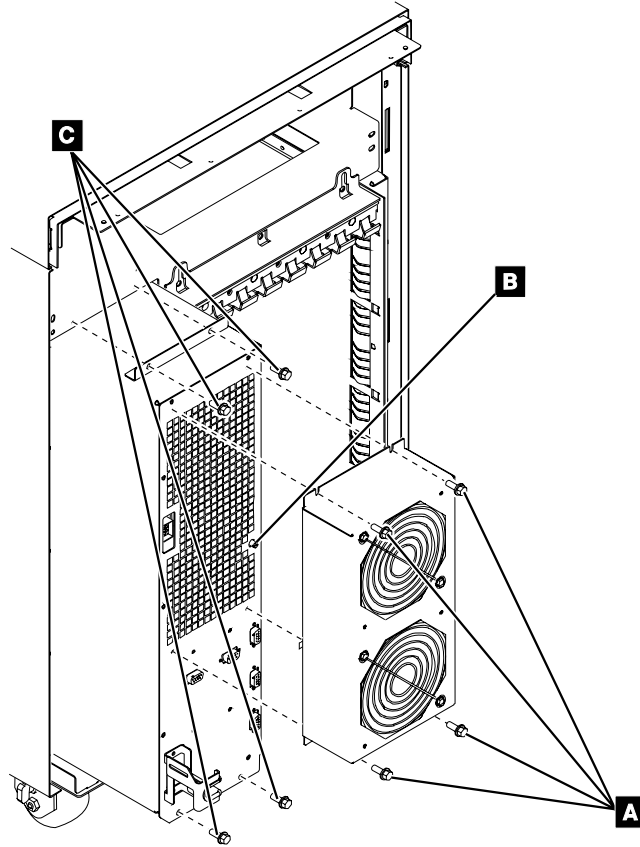
If there is a power supply or power supplies installed, remove the power supply or power supplies (see “FC 507x/508x” on page 665).

5. Label and remove all cables connected to the ac module, including the power cord.
6. Remove the AMD assembly by removing the screws **A**.
7. If a leadscrew **B** is installed in the ac module, turn the leadscrew counterclockwise until it stops.
8. Remove the ac module by removing the screws **C**.
9. Install the parts of the ac module by reversing the removal procedure.

The AC module is spring loaded. Push the AC module to get the screws started.

After exchanging an item, go to “Verifying the Repair” on page 866.

This ends the procedure.



RV3B414-3

AMDs (Air Moving Devices)

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687
- “Parts Assemblies” on page 761

FC 5033, FC 5034, and FC 5035

1. Power off the expansion tower. (See “Powering On and Powering Off the System or Expansion Tower” on page 868.)
2. Disconnect the power cord from the expansion tower.
3. Remove the covers (see “Covers” on page 638).
4. Are you removing an AMD from a pedestal?

No **Yes**

↓

- a. Remove the pedestal EMC access plate.
- b. Remove the screws that hold the AMD assembly.
- c. Slide the AMD assembly out of the pedestal.

This ends the procedure.

5. Remove the EMC access plate.

Note: When installing this EMC access plate, ensure that slotted screws are used to secure the shield to the frame.

6. Disconnect the power cables connected to the AMDs.
7. Remove the screws that hold the AMD assembly.
8. Slide the AMD assembly out of the frame.

This ends the procedure.

FC 5065 or FC 5066

1. Power off the expansion tower. (See "Powering On and Powering Off the System or Expansion Tower" on page 868.)
2. Disconnect the power cord from the expansion tower.
3. Open the rear cover. (See "FC 5065 and FC 5066" on page 639.)
4. Remove the EMC access plate that is located directly above the PCI card enclosure. Press the surfaces of the two latching mechanisms together and tilt the top of the cover away from the frame to remove it.
5. Remove the screw from the EMC access plate for the AMD that you are replacing. For location information, see "FC 5065, FC 5066 – Expansion Tower" on page 705.
6. Remove the AMD by sliding it out of the enclosure while holding the EMC access plate open.
7. Install the AMD by reversing the removal procedure. After exchanging an item, go to "Verifying the Repair" on page 866.

This ends the procedure.

FC 5077

Note: When you install the new AMD, some force is required to insert the AMD past the spring-loaded flap.

Front AMDs

1. Power off the expansion tower. (See "Powering On and Powering Off the System or Expansion Tower" on page 868.)
2. Disconnect the power cord from the expansion tower.
3. Remove the front cover (see "Covers" on page 638).
4. Remove the Bulk Power EMC access plate.
5. Remove the AMD assembly.

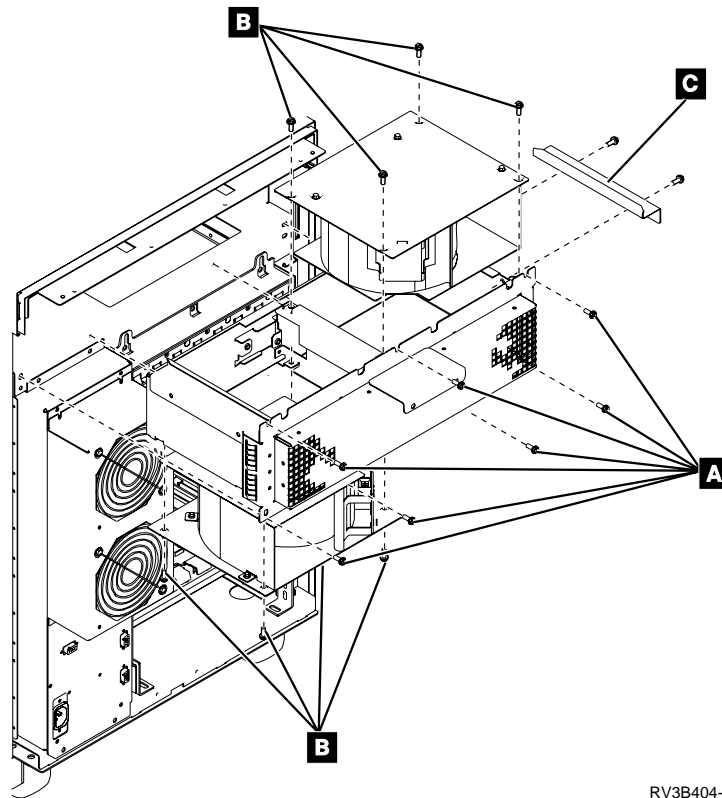
This ends the procedure.

Rear AMDs

1. Power off the expansion tower. (See "Powering On and Powering Off the System or Expansion Tower" on page 868.)
2. Disconnect the power cord from the expansion tower.
3. Remove the rear cover (see "Covers" on page 638).
4. Remove the Rear AMD EMC access plate.
5. Remove the AMD assembly.

This ends the procedure.

FC 507x and FC 508x



1. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord.
3. Remove the rear cover (see “Covers” on page 638).
4. Remove the screws **A**.
5. Pull the AMD assembly from the frame.
6. Remove the screws **B** that hold the AMD you are exchanging to the AMD assembly. You may need to remove the blower support bracket **C**.
7. Install the parts of the AMD assembly by reversing the removal procedure. After exchanging an item, go to “Verifying the Repair” on page 866.
This ends the procedure.

Backplanes

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687
- “Parts Assemblies” on page 761

FC 5033, FC 5034, and FC 5035 Tower Card

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

1. Power off the expansion tower (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
2. Disconnect the power cord from the expansion tower.
3. Remove the covers (see "Covers" on page 638).
4. Remove the left side EMC access plate.

Note: When installing this EMC access plate, ensure that slotted screws are used to secure the shield to the frame.

5. Record the location of the PCI cards.
6. Record the cable locations and disconnect the cables to the PCI cards.
7. Remove the PCI cards (see "Cards – in FC 503x PCI expansion" on page 615).
8. Disconnect the cables that are connected to the backplane.
9. Remove the screws that hold the long PCI card bracket to the frame. Slide the bracket out of the frame.
10. Remove the screws that hold the metal divider that was under the long PCI card bracket and tilt the divider toward the front of the frame. This will expose a screw holding the backplane to the frame.
11. Remove the screws holding the backplane to the frame.
12. Lift the backplane assembly up off the frame and rotate it toward the front of the system.
13. Disconnect the bus cable from the rear of the backplane.
14. Remove the backplane assembly from the system.

This ends the procedure.

FC 5033, FC 5034, and FC 5035 Tape / Optical Backplane

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

1. Power off the expansion tower (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
2. Disconnect the power cord from the expansion tower.
3. Remove the front and side covers (see "Covers" on page 638).
4. Remove the EMC access plate from the side of the frame.

Note: When installing this EMC access plate, ensure that slotted screws are used to secure the shield to the frame.

5. Remove the AMDs, if necessary for additional working space (see "FC 5033, FC 5034, and FC 5035" on page 595).
6. Remove the control panel assembly (see "Control Panel Assembly" on page 636).
7. Remove the cables on the top of the rear of the backplane.
8. Slide the backplane forward out of the frame.

This ends the procedure.

FC 5033, FC 5034, and FC 5035 Disk Unit Backplane

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord from the expansion tower.
3. Remove the covers (see “Covers” on page 638).
4. Remove the EMC access plate from the side of the frame.

Note: When installing this EMC access plate, ensure that slotted screws are used to secure the shield to the frame.

5. Remove the AMDs (see “AMDs (Air Moving Devices)” on page 595).
6. Remove the cables from the rear of the disk unit backplane.
7. Remove all disk units (see the disk unit procedure in “Chapter 4. Removal and Installation Procedures” on page 593) and label the position of each. **The disk units must be installed in the same positions they were removed from.**
8. Remove the screws that hold the frame assembly.
9. Remove the frame assembly from the system.

This ends the procedure.

FC 5033, FC 5034, and FC 5035 Expansion SPD Backplane

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord from the expansion tower.
3. Remove the covers (see “Covers” on page 638).
4. Remove the right side EMC access plates .

Note: When installing this EMC access plate, ensure that slotted screws are used to secure the shield to the frame.

5. Remove the SPD cards (see “Cards – in FC 503x SPD expansion” on page 616).

Note: Label the location of the cards and cables.

6. Disconnect the cables that are connected to the backplane.
7. Remove the screws that hold the SPD backplane frame.
8. Lift the backplane and frame out the rear of the system.

This ends the procedure.

FC 5033, FC 5034, and FC 5035 Expansion PCI Backplane

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord from the expansion tower.
3. Remove the right side cover (see “Covers” on page 638).
4. Remove the right side EMC access plate .

Note: When installing this EMC access plate, ensure that slotted screws are used to secure the shield to the frame.

5. Record the location of the PCI cards.
6. Remove the PCI cards (see “Cards – in FC 503x PCI expansion” on page 615).
7. Remove the AMDs, if necessary (see “FC 5033, FC 5034, and FC 5035” on page 595).
8. Disconnect the cables that are connected to the backplane.
9. Remove the screws that hold the PCI backplane.
10. Lift the backplane assembly up off the frame and rotate it toward the front of the system.
11. Disconnect the bus cable from the rear of the backplane.
12. Remove the backplane assembly from the system.

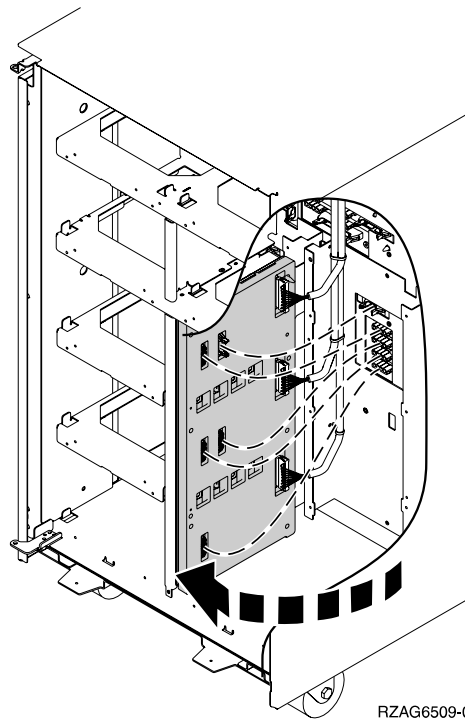
This ends the procedure.

FC 5065 or FC 5066 Backplanes – DB1 and DB2

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord from the expansion tower.
3. Open the front cover. (See “FC 5065 and FC 5066” on page 639.)
4. From the front of the expansion tower **remove** the following:
 - a. Remove the EMC access plates from the disk unit enclosures that are located in front of the backplane that you are replacing. For location information, see “FC 5065, FC 5066 – Expansion Tower” on page 705. Press the surfaces of the two latching mechanisms together and tilt the top of the cover away from the frame to remove it.
 - b. Record the locations of the disk units and then remove them from the disk unit enclosures that you just uncovered.

Attention: The disk units are sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).
 - c. Remove the screws that hold the disk unit cage assembly in to the frame.
 - d. Remove the two retaining screws that are located inside of the disk unit cage assembly (the top right and bottom left corners).
 - e. Remove the disk unit cage assemblies.
 - f. Remove the screws that hold the DASD shelf to the frame.
 - g. Remove the DASD shelf from the frame.
5. Remove the retaining screw that is holding the DASD board assembly to the frame.
6. Pull the DASD board assembly out until it slides off the guide pins, then rotate the DASD board assembly 90° to remove the cables that are located on the

backside of it.



7. Remove the cables from the rear of the DASD board assembly and note their locations.

Note: Both ends of the ribbon cables are marked “LH” or “RH” indicating that one end of the cable is plugged in to either the left-hand (DB1) or right-hand (DB2) DASD board assembly. The other end of the cable is plugged in to either the left-most (LH) or right-most (RH) DASD controller card (The cables will crisscross in the center of the tower).

8. Remove the DASD board assembly.
9. Install the DASD board assembly by reversing the removal procedure. After exchanging an item, go to “Verifying the Repair” on page 866.

This ends the procedure.

FC 5065 or FC 5066 Backplanes – DB3

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord from the expansion tower.
3. Open the rear cover. (See “FC 5065 and FC 5066” on page 639.)
4. From the rear of the expansion tower **remove** the following:
 - a. Remove the EMC access plate that is located directly above the tower card enclosure. Press the surfaces of the two latching mechanisms together and tilt the top of the cover away from the frame to remove it.
 - b. Remove the cables from the disk unit controller cards (IOAs) that are located inside the PCI card enclosure and note their locations.

Note: Both ends of the ribbon cables are marked “LH” or “RH” indicating that one end of the cable is plugged in to either the left-hand (DB1) or right-hand (DB2) DASD board assembly. The other end of the

cable is plugged in to either the left-most (LH) or right-most (RH) DASD controller card (The cables will crisscross in the center of the tower).

- c. Remove the screws that hold the tower card enclosure in the frame.
 - d. Pull the tower card enclosure partially out of the frame while lifting the cables clear of the enclosure.
 - e. Press the release mechanism that is located along the top right side of the enclosure and carefully slide the enclosure towards you. Make sure that the cables are clear of the enclosure.
 - f. Remove the tower card enclosure from the frame.
 - g. Remove the screws from the EMC access plate that is located inside the frame and directly above the power distribution board.
 - h. Remove the EMC access plate.
 - i. Reach through the opening and remove the cables from the backside of the base DASD board assembly (DB3).
5. Open the front cover. (See "FC 5065 and FC 5066" on page 639.)
6. From the front of the expansion tower **remove** the following:
- a. Note the removable media locations and then remove them by pulling out on the handles which are located on each side of the unit.
 - b. Remove the control panel by pulling on the blue handles that are located on each side of the unit and sliding it partially out of the tower. Then, unplug the cable from the rear of the control panel. (See "Control Panel Assembly" on page 636.)
 - c. Unplug the control panel cable from the base DASD board assembly (DB3).
 - d. Remove the two retaining screws that are located inside of the removable media enclosure (the top right and lower left corners).
 - e. Remove the removable media enclosure.
 - f. Remove the EMC access plates from the disk unit enclosures that are located in front of the backplane (DB3). For location information, see "FC 5065, FC 5066 – Expansion Tower" on page 705. Press the surfaces of the two latching mechanisms together and tilt the top of the cover away from the frame to remove it.
 - g. Record the disk unit locations and then remove them from the disk unit enclosures that you just uncovered.
Attention: The disk units are sensitive to electrostatic discharge (see "Appendix C. Working with Electrostatic Discharge-Sensitive Parts" on page 899).
 - h. Remove the screws that hold the disk unit enclosures to the frame.
 - i. Remove the retaining screws that are located inside the disk unit enclosure.
 - j. Remove the disk unit enclosures.
 - k. Remove the screws that hold the center support bracket and shelf for the disk unit and removable media enclosure to the frame.
 - l. Remove the support bracket and shelf.
 - m. Remove the base DASD board assembly (DB3).
7. Install the base DASD board assembly by reversing the removal procedure. After exchanging an item, go to "Verifying the Repair" on page 866.

This ends the procedure.

FC 5065 or FC 5066 Tower Card Assembly – CB1

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Remove the power cord from the expansion tower.
3. Open the rear cover. (See “FC 5065 and FC 5066” on page 639.)
4. From the rear of the expansion tower remove the following:
 - a. The external cables from the rear of the PCI card enclosure and note their locations.
 - b. The EMC access plate that is located directly above the PCI card enclosure. Press the surfaces of the two latching mechanisms together and tilt the top of the cover away from the frame to remove it.
 - c. The cables from the top of the PCI cards and note their locations.
Attention: All cards are sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).
 - d. The screws that hold the PCI card enclosure to the frame.
 - e. Pull the PCI card enclosure partially out of the frame while lifting the cables clear of the enclosure.
 - f. Press the release mechanism that is located along the top right side of the enclosure and carefully slide the enclosure towards you. Make sure that the cables are clear of the enclosure.
5. Remove the PCI cards from the enclosure and note their locations. (See “Cards – in FC 5065 or FC 5066” on page 617.)
6. Remove the retaining fasteners (standoffs) that hold the J11, J14, J15, and J16 connectors to the PCI enclosure.
7. Remove the screws that hold the tower card assembly to the PCI card enclosure.
8. Disconnect the top ribbon cable from the tower card assembly and note its location.
9. Turn the PCI card enclosure on to its side. Reach through the opening in the bottom of the enclosure and disconnect the two remaining ribbon cables from the tower card assembly.
10. Slide the tower card forward and tilt the rear edge of the tower card assembly upwards and lift it from the enclosure.
11. Install the tower card assembly by reversing the removal procedure. After exchanging an item, go to “Verifying the Repair” on page 866.

This ends the procedure.

FC 5077 Tower Card Assembly

1. Print out a rack configuration sheet so that you know where all devices and cards are located in the system rack.
2. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
3. Disconnect the power cord.
4. Remove the front and rear system covers (see “Covers” on page 638).

Perform the following steps from the ***** FRONT ***** of the system.

5. Loosen the two thumbscrews on the control panel and swing out the control panel.

6. Disconnect the cables from the control (op) panel assembly.
7. Remove the control panel assembly from the frame.
8. Remove the upper and lower Front Cage EMC access plates.
9. Remove the I/O Tower panel cable from the right EMC bracket.
10. Remove the EMC brackets from around the Front Cage in the following order:
 - Top
 - Left and Right
11. Mark the processor, memory, regulator, and filler cards and their locations in the Front Cage so you can return the cards to their proper location during reassembly.
12. Remove the processor, memory, regulator, and filler cards from the Front Cage.

Perform the following steps from the ***** REAR ***** of the system.

13. Remove the upper and lower EMC access plates from the rear cage assembly.
14. Remove the EMC brackets from around the rear cage in the following order:
 - Top
 - Left and Right
15. Mark the SPCN card, regulators, memory, and filler cards and their locations in the top and bottom of the rear cage so that you can return the cards to their proper location during reassembly.
16. Remove the SPCN card, regulators, memory, and filler cards from the top and bottom of the rear cage.
17. Remove the mounting screws from the lower part of the rear cage.
18. Remove the two Cable EMC access plates from the rear cage.
19. Remove the Air Baffle in the lower center of the rear cage.
20. Unplug the cables attached to the upper left and upper right corners of the Front Cage/Backplane assembly.
21. Remove the 6 'starred' screws that mount the rear cage to the Front Cage/Backplane assembly.
22. **CAUTION:**
The weight of this part or unit is between 18 and 32 kilograms (39.7 and 70.5 pounds). It takes two persons to safely lift this part or unit. (RSFTC204)
Remove the rear cage assembly from the back of the system.
23. Unplug the cables attached to the lower left and right corners of the Front Cage/Backplane assembly.

Perform the following steps from the ***** FRONT ***** of the system.

***** IMPORTANT ***** The Front Cage/Backplane assembly is heavier on the rear than it is on the front. The Front Cage/Backplane assembly may tip to the rear if it is not properly handled.

24. Remove the lower mounting screws from the Front Cage/Backplane assembly.
25. Use two people to remove Front Cage/Backplane assembly from the front of the system.
26. **CAUTION:**
The weight of this part or unit is between 18 and 32 kilograms (39.7 and 70.5 pounds). It takes two persons to safely lift this part or unit. (RSFTC204)
Place the Front Cage/Backplane assembly on the floor in the upright position.
27. Disconnect the control panel cable from Backplane.

28. There are 6 'starred' screws inside the Front Cage/Backplane assembly that mount the Backplane to the cage. From inside the Front Cage, remove five of the 'starred' screws.
29. To prevent the Backplane from falling, hold the back plane to the cage and then remove the last 'starred' screw.
30. Lay the Front Cage face down on the floor so the back plane is on top.
31. Remove the Backplane from Front Cage.
32. Close all of the connector latches on the new Backplane. The latches need to be closed so they do not interfere with the rear cage when it is installed.
33. To complete the replacement, reverse the previous steps beginning with step 25 on page 604.

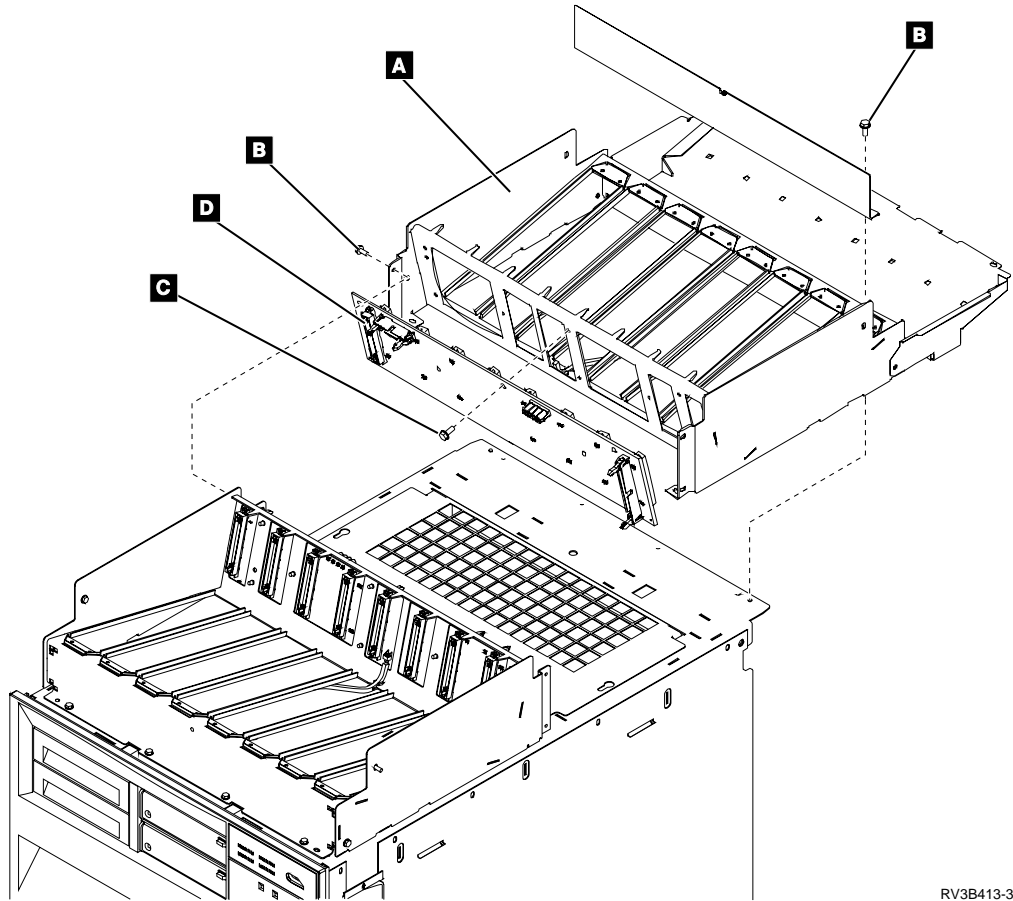
This ends the procedure.

FC 507x/508x Storage Expansion Unit Backplane

1. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
2. Disconnect the power cord.
3. Remove the front, rear, and top covers (see "Covers" on page 638).
4. If there are front and back rail assemblies, remove the back rail assembly **A** by doing the following:
 - a. Remove the screws **B**.
 - b. Disconnect the cables attached to the backplane.
 - c. Remove the rail assembly.
5. Remove the screws **C** holding the backplane to the rail assembly.
6. If a terminating plug is attached to the backplane (at location **D**), remove it and install it on the new backplane.
7. Assemble the parts of the storage expansion unit backplane by reversing the removal procedure.

After exchanging an item, go to "Verifying the Repair" on page 866.

This ends the procedure.



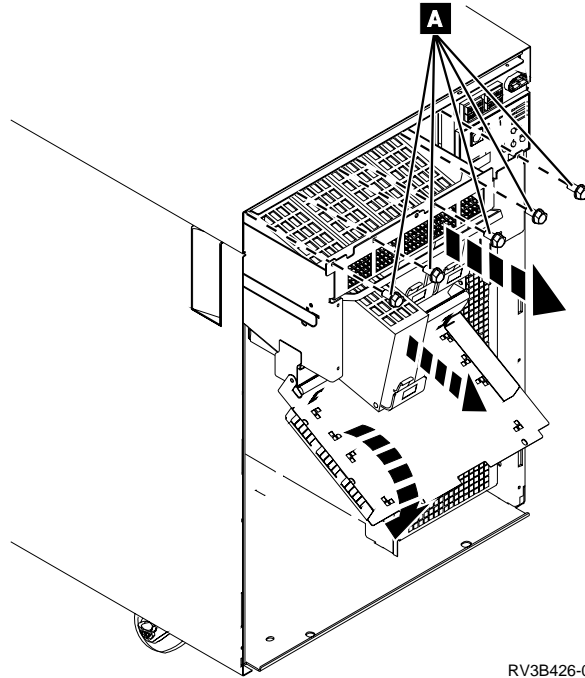
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FC 507x/508x Upper Disk Unit Enclosure Backplane

1. Power off the system (see "Powering Off the System" on page 868).
2. Disconnect the power cord.
3. Remove the front cover (see "Covers" on page 638).
4. Remove the screws and pivot the shield down.
5. Remove the disk units in the upper disk unit enclosure (see "FC 507x/508x Disk Unit (Dedicated)" on page 655).
6. Remove the screws **A**.
7. Pull the upper disk unit enclosure out.
8. Assemble the parts of the upper disk unit enclosure backplane by reversing the removal procedure.

After exchanging an item, go to "Verifying the Repair" on page 866.

This ends the procedure.



RV3B426-0

Battery

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687
- “Parts Assemblies” on page 761

FC 5065 or FC 5066 Battery

CAUTION:

The battery is a lead-acid battery. To avoid possible explosion, do not burn. Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations.

In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (RSFTC225)

Attention: Removing the battery power unit while the system is running on battery power will cause the system to fail and may damage the battery power unit and the backplane.

1. If the system has AC power on or if the system is powered on, the control panel backlight will be on or characters will be displayed. Is the control panel green backlight on or are characters displayed?

No Yes

↓ Do NOT power off the system. Go to step 3 on page 608 of this procedure.

2. If the system is powered off or running on battery power, AC power must be applied to all of the power supplies before continuing with this procedure.

3. Open the rear cover. (See "FC 5065 and FC 5066" on page 639.)
4. **Attention:** Removing the battery power unit while the system is running on battery power will cause the system to fail and may damage the battery power unit and the PCI card enclosure.

If the console will accept commands, the system is not running on battery power. Continue with the next step of this procedure.

5. To remove the battery power unit perform the following:

CAUTION:

Be careful when removing or installing this part or unit. This part or unit is heavy, but has a weight smaller than 18 kilograms (39.7 pounds). (RSFTC201)

- a. Remove the screws from the EMC access plate that is covering the the batteries.
- b. Remove the EMC access plate from the battery enclosure.
- c. Remove the top and bottom screws from the battery unit.
- d. Pull on the ring using two hands to remove the battery power unit.

CAUTION:

The battery is a lead-acid battery. To avoid possible explosion, do not burn. Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations.

In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (RSFTC225)

Remove the battery unit from the frame.

- e. Install the battery power unit by reversing the removal procedure. After exchanging an item, go to "Verifying the Repair" on page 866.

This ends the procedure.

FC 5077 Battery

Attention: Removing the battery power unit while the system is running on battery power will cause the system to fail and may damage the battery power unit and the card enclosure.

1. If the system is powered on, you do not have to power off the system to perform this procedure.
2. Remove the rear cover (see "Covers" on page 638).
3. Remove the Battery Backup EMC access plate.
4. Remove the battery.

CAUTION:

The weight of this part or unit is between 18 and 32 kilograms (39.7 and 70.5 pounds). It takes two persons to safely lift this part or unit. (RSFTC204)

CAUTION:

The battery is a lead-acid battery. To avoid possible explosion, do not burn. Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations.

In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (RSFTC225)

Note: After you install the new battery, perform “POW-PIP3” on page 407 to ensure correct operation.

This ends the procedure.

FC 507x/508x Battery Power Unit

If you are removing or installing a 2-part battery, see “FC 507x/508x Battery Power Unit (2-Part)” on page 610.

Attention: Removing the battery power unit while the system is running on battery power will cause the system to fail and may damage the battery power unit and the card enclosure.

1. If the system has ac power on or if the system is powered on, the control panel backlight will be on.

Is the control panel green backlight on?

No **Yes**

↓ Go to step 3 of this procedure.

2. Check the system ac power for failure and correct any problems found.
3. Remove the front cover (see “Covers” on page 638).
4. Loosen the screws **A**.
5. Remove the screws **B**.
6. Pull out and lift to remove the screen.
7. **Attention:** Removing the battery power unit while the system is running on battery power will cause the system to fail and may damage the battery power unit and the card enclosure.
If the console will accept system commands, the system is **not** running on battery power. Continue with the next step of this procedure.
8. Remove the screws **C** to remove the battery power unit.

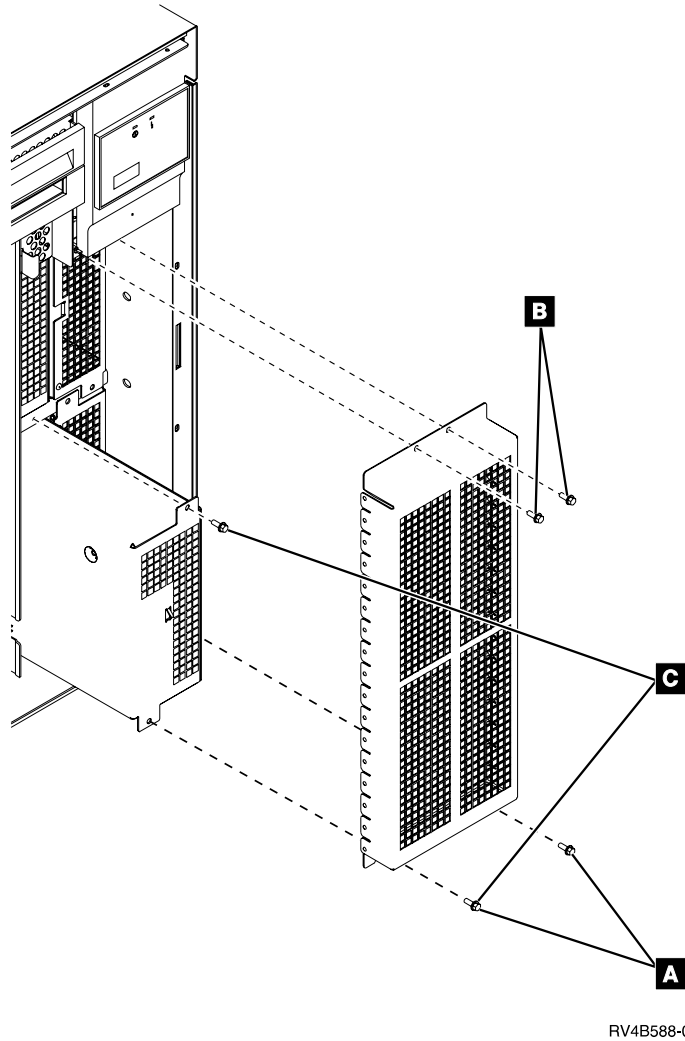
CAUTION:

The battery is a lead-acid battery. To avoid possible explosion, do not burn. Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations.

In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (RSFTC225)

9. Install the battery power unit by reversing the removal procedure.
10. After exchanging an item, go to “Verifying the Repair” on page 866.

This ends the procedure.



FC 507x/508x Battery Power Unit (2-Part)

Use this procedure to remove the battery power unit that can be separated from the battery power unit charger. Also use this procedure to remove the battery power unit charger.

1. Does the system have ac power on?

You can verify that ac power is applied by looking to see if the panel backlight is on.

No **Yes**

↓ Do not power off the system. Go to step 3 of this procedure.

2. If the system is powered off or running on battery power, ac power must be applied to the ac module before continuing with this procedure.
3. Remove the front cover.
4. Pull out to remove screen A.
5. **Attention:** Removing the battery power unit while the system is running on battery power will cause the system to fail and may damage the battery power unit and the card enclosure.

If the console will accept system commands, the system is **not** running on battery power. Continue with the next step of this procedure.

6. To remove both the battery power unit charger **E** and the battery power unit **D**, perform the following:

CAUTION:

Be careful when removing or installing this part or unit. This part or unit is heavy, but has a weight smaller than 18 kilograms (39.7 pounds). (RSFTC201)

- a. Remove the screws **C**.
- b. Pull on the ring and then use two hands to remove the battery power unit and the battery power unit charger.
- c. Loosen the screws **B**.
- d. Separate the battery power unit from the battery power unit charger.

CAUTION:

The battery is a lead-acid battery. To avoid possible explosion, do not burn. Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations.

In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (RSFTC225)

7. To remove only the battery power unit **D**, perform the following:

CAUTION:

Be careful when removing or installing this part or unit. This part or unit is heavy, but has a weight smaller than 18 kilograms (39.7 pounds). (RSFTC201)

- a. Loosen the screws **B**.
- b. Pull on the ring, then use two hands to remove the battery power unit.

CAUTION:

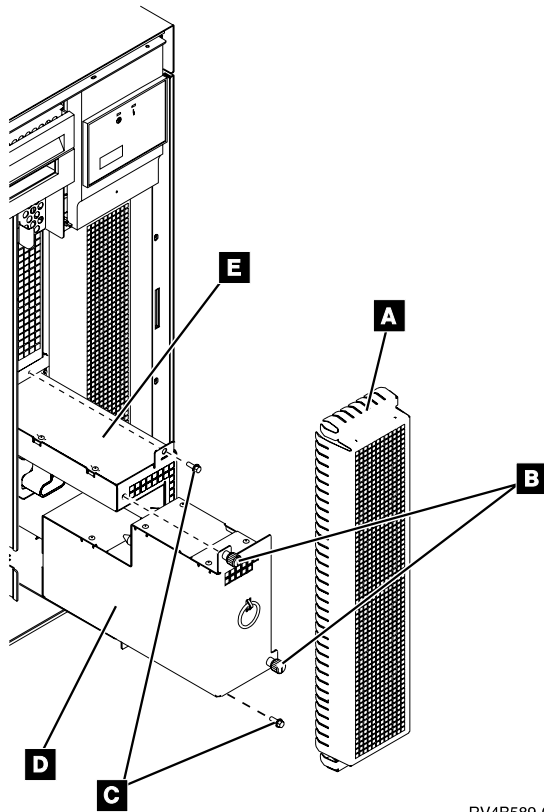
The battery is a lead-acid battery. To avoid possible explosion, do not burn. Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations.

In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (RSFTC225)

8. Install the battery power unit and the battery power unit charger by performing the following:
 - a. Install the battery power unit charger into the system.
 - b. Insert and tighten the screws **C**
 - c. Install the battery power unit slowly into the system.
 - d. Tighten the screws **B**
 - e. Install the screen.
 - f. Install the front cover.

After exchanging an item, go to “Verifying the Repair” on page 866.

This ends the procedure.



RV4B589-0

FC 507x/508x Battery Power Unit - External

1. Verify that ac power is applied by looking to see if the panel backlight is on.
Does the system have ac power on?
No **Yes**
↓ Do not power off the system. Go to step 3 of this procedure.
2. If the system is powered off or running on battery power, ac power must be applied to the ac module before continuing with this procedure.
3. Remove the front cover (see "Covers" on page 638).
4. Loosen the screws **A**.
5. Remove the screws **B**.
6. Pull out and lift to remove the screen.
7. **Attention:** Removing the external battery power unit charger or cable while the system is running on battery power causes the system to fail and may damage the external battery power unit and the card enclosure.
If the console will accept system commands, the system is **not** running on battery power. Continue with the next step of this procedure.
8. To remove the cable **D**, do the following:
 - a. Remove screw **E** on the cable clamp.
 - b. Pull on the cable connector **C** to disconnect the cable from the charger.
 - c. Remove the cable from the cable clamp.
 - d. Remove the battery rear cover.
 - e. Remove the screws **F** and cover.

- f. Remove the screws **G** and cable clamp.
 - g. Pull on the cable connector to disconnect the cable from the battery.
9. To remove the charger **H**, do the following:
- a. Remove the screws **I**.
 - b. Pull the charger from the frame.
10. To remove the battery **J**, do the following:

CAUTION:

The weight of this part or unit is more than 55 kilograms (121.2 pounds). It takes specially trained persons with a lifting device to safely lift this part or unit. (RSFTC206)

- a. Remove the battery rear cover.
- b. Pull on the cable connector to disconnect the cable from the battery.

CAUTION:

The battery is a lead-acid battery. To avoid possible explosion, do not burn. Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations.

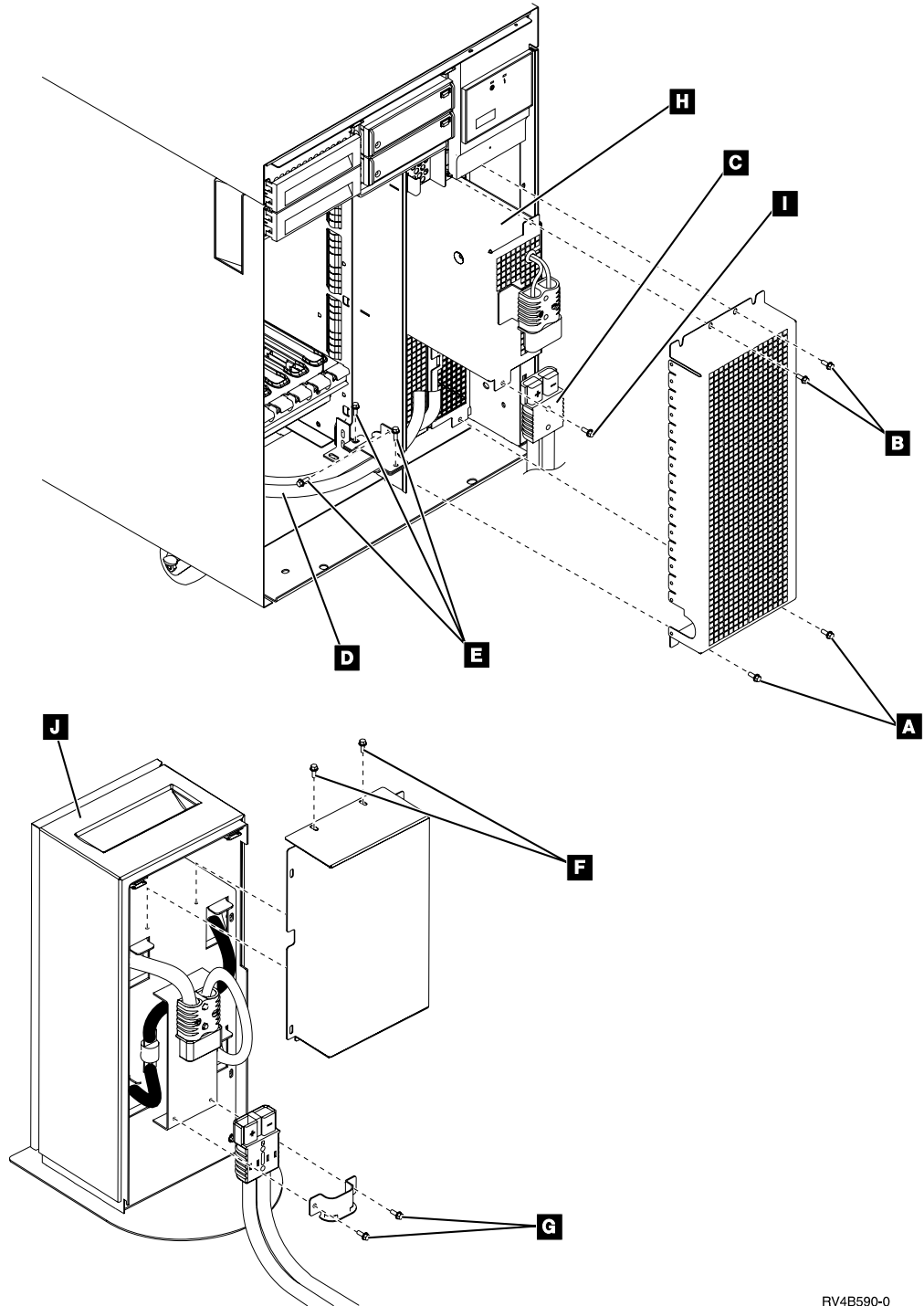
In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (RSFTC225)

11. Install the parts of the external battery power unit by doing the following:
- a. Connect the cable to the battery and install the rear cover.
 - b. Connect the cable to the charger.
 - c. Install the charger into the frame.
 - d. Reverse the remainder of the removal procedure.

Note: The external battery power unit charger assembly must be removed and installed with the battery cable attached to reset the battery error.

After exchanging an item, go to “Verifying the Repair” on page 866.

This ends the procedure.



RV4B590-0

Battery Charger

Reference the expansion tower you are working on in the following sections of this book:

- "Expansion Tower Locations and Addresses" on page 687
- "Parts Assemblies" on page 761

FC 5065 or FC 5066

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the incoming AC power cord from the expansion tower.
3. Open the rear cover. (See “Covers” on page 638.)
4. Disconnect all the power cords from the battery charger.
5. Remove the screws that are holding the charger to the frame.
6. Remove the battery charging unit.
7. Install the battery charger by reversing the removal procedure. After exchanging an item, go to “Verifying the Repair” on page 866.

This ends the procedure.

FC 5077

1. **Do not power off the system.**
2. Remove the rear cover (see “Covers” on page 638).
3. Remove the Battery Backup EMC access plate.
4. Remove the battery charger.

This ends the procedure.

Cards

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687

Cards – in FC 503x PCI expansion

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

Attention: All cards are sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

CAUTION:

This card assembly contains a lithium battery. To avoid possible explosion, do not burn, exchange, or charge the battery. Discard the card assembly as instructed by local regulations for lithium batteries. (RSFTC233)

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

1. Power off the system. (see “Powering On and Powering Off the System or Expansion Tower” on page 868)
2. Disconnect the power cord from the expansion unit.
3. Remove the covers (see “Covers” on page 638).
4. Remove the safety shield.

- a. Remove the screw that holds the interlock jumper plug.
 - b. Press down on the top of the safety shield to release the shield holding clips from the frame while (at the same time) pressing the tabs over the interlock jumper plug to release the shield from the interlock.
 - c. Pull the top of the shield away from the system unit and lift the shield out of the slots in the frame at the bottom of the safety shield.
5. Remove the EMC access plate.

Note: When installing this EMC access plate, ensure that slotted screws are used to secure the shield to the frame.

6. Disconnect the cables that are connected to the PCI card.

Note: Label the cables to ensure correct installation.

7. Record the location of the card being removed.
8. Remove the screw that holds the card bracket.

Note: If you are exchanging a type 4758 PCI Cryptographic Coprocessor, go to "Type 4758 Disablement Procedure" on page 627.

Attention:

Note: If you are exchanging a type 2726 or 2741, you must remove the cache card from the original type 2726, 2741 card and install it on the new card. See "Type 4010 Card Cache Replacement Procedure" on page 624.

Note: If you are exchanging a type 2748, you must place the mode jumper in the same location as it is on the card that you are replacing. See "Storage I/O Card Modes and Jumpers" on page 876 for information on mode and jumper locations.

9. Pull the card out of the system.

This ends the procedure.

Cards – in FC 503x SPD expansion

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

Attention: All cards are sensitive to electrostatic discharge (see "Appendix C. Working with Electrostatic Discharge-Sensitive Parts" on page 899).

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

1. Power off the expansion tower. (See "Powering On and Powering Off the System or Expansion Tower" on page 868.)
2. Disconnect the incoming AC power cord from the expansion tower.
3. Remove the rear covers from the expansion unit (see "Covers" on page 638).
4. Loosen the screws on the card retaining bar and move it up to release the card latches.
5. Label and disconnect any cables attached to the card you are going to remove.
6. If you are working with card type 2620, 2628, 65x2, or 6532, 6533, read the following:

CAUTION:

This card assembly contains a lithium battery. To avoid possible explosion, do not burn, exchange, or charge the battery. Discard the card assembly as instructed by local regulations for lithium batteries. (RSFTC233)

7. If you are working with card type 2664 read the following:

DANGER

Use caution when installing or modifying telephone lines. Disconnect the lines at the network interface before working with telephone wires that are not insulated. Never install telephone jacks that are not waterproof in wet locations. Do not install or modify telephone lines or use a telephone (other than a cordless type) during an electrical storm. Do not use a telephone to report a gas leak in the area of the leak. (RSFTD213)

8. If you are working with card type 2620 or 2628, read the following:

Attention: Disconnecting or removing the type 2620 or type 2628 cryptographic I/O processor causes the loss of the master encryption key. Read “Important Cryptographic I/O Processor Information” on page 884 before disconnecting or removing the cryptographic I/O processor.

9. If you are working with card type 2624, read the following:

If a retainer is installed on the adapter card in adapter card position A and you need to remove this plug to exchange the adapter card, ensure that you reinstall the retainer.

10. If you are removing a full-size card from the slot, do the following:

- a. Press the two latch surfaces together to release each latch.
- b. Pull on both latches at the same time to remove the card from the slot.

11. If you are removing an adapter card from a full-size card, do the following:

- a. Remove any cables or wrap plugs from the adapter cards.
- b. Press the two latch surfaces together to release the latch.
- c. Rotate the latch downward.
- d. Pull on the latch to remove the adapter card from the full-size card.

This ends the procedure.

Cards – in FC 5065 or FC 5066

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

Attention: All cards are sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

CAUTION:

This card assembly contains a lithium battery. To avoid possible explosion, do not burn, exchange, or charge the battery. Discard the card assembly as instructed by local regulations for lithium batteries. (RSFTC233)

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

1. Power off the expansion tower. (See “Powering On and Powering Off the System or Expansion Tower” on page 868.)
2. Disconnect the incoming AC power cord from the expansion tower.

3. Open the rear cover. (See “Covers” on page 638.)
4. Remove the EMC access plate that is located directly above the PCI card enclosure. Press the surfaces of the two latching mechanisms together and tilt the top of the cover away from the frame to remove it.
5. Remove the screws that are holding the PCI card enclosure to the frame.
6. Disconnect the cable from the card that is located in C04 and partially slide the PCI card enclosure out of the tower until it stops.
7. Disconnect the cables that are connected to the PCI card that you are replacing.

Note: Label the cables to ensure correct installation.

8. Record the location of the card that you are removing.
9. Remove the screw that holds the card bracket to the enclosure.
10. Pull the card out of the PCI card enclosure.

Note: If you are exchanging a type 4758 PCI Cryptographic Coprocessor, go to “Type 4758 Disablement Procedure” on page 627.

Note: If you are exchanging a type 2726 or 2741, you must remove the cache card from the original type 2726, 2741 card and install it on the new card. See “Type 4010 Card Cache Replacement Procedure” on page 624.

Note: If you are exchanging a type 2748, you must place the mode jumper in the same location as it is on the card that you are replacing. See “Storage I/O Card Modes and Jumpers” on page 876 for information on mode and jumper locations.

Install the card that you replaced by reversing the removal procedure. After exchanging an item, go to “Verifying the Repair” on page 866.

This ends the procedure.

Cards – in FC 5077

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

Attention: All cards are sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

1. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord.
3. Remove the front or rear cover to access the card you are replacing (see “Covers” on page 638).
4. Remove the EMC access plate for the card location that you are accessing.
5. Mark the cables that are attached to the card so you can return them to the correct location during reassembly.
6. Remove the cables attached to the card.
7. Remove the card.

This ends the procedure.

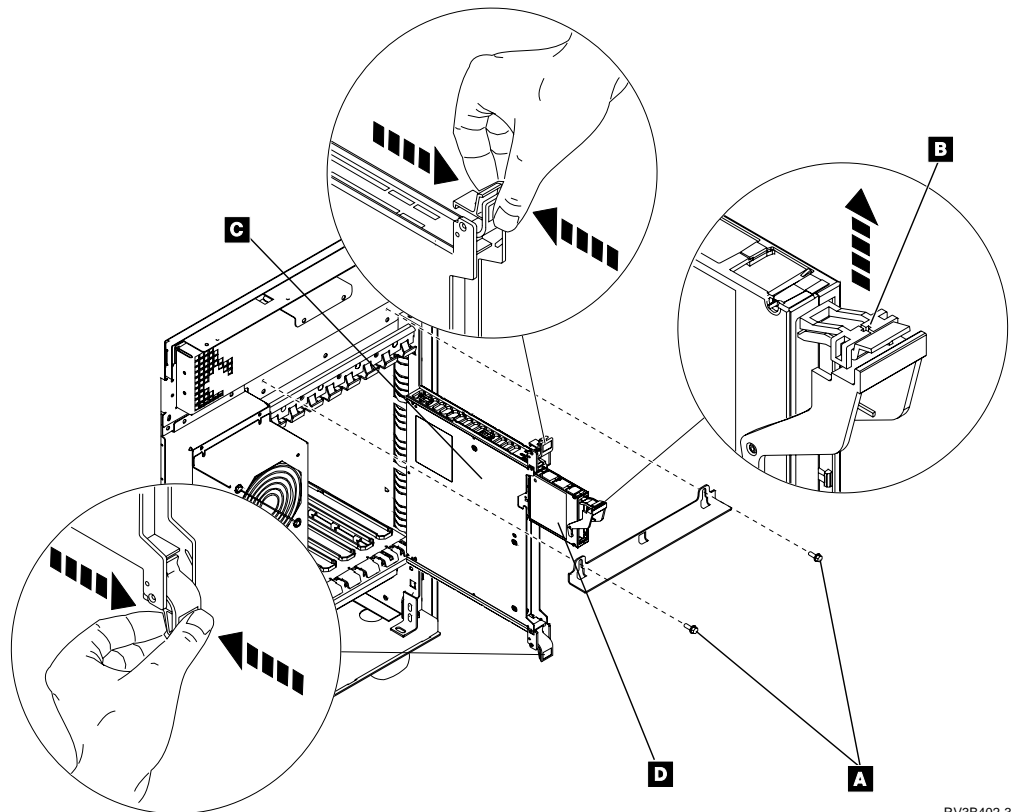
Cards – in FC 507x/508x

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

Attention: All cards are sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)



1. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cords.
3. Remove the front or rear cover (see “Covers” on page 638).
4. Loosen the screws **A** on the card retaining bar.
5. Label and disconnect any cables attached to the card you are going to remove.
6. If you are working with card type 2620, 2628, or 65x2, read the following:

CAUTION:

This card assembly contains a lithium battery. To avoid possible explosion, do not burn, exchange, or charge the battery. Discard the card assembly as instructed by local regulations for lithium batteries. (RSFTC233)

7. If you are working with card type 2664 read the following:

DANGER

Use caution when installing or modifying telephone lines. Disconnect the lines at the network interface before working with telephone wires that are not insulated. Never install telephone jacks that are not waterproof in wet locations. Do not install or modify telephone lines or use a telephone (other than a cordless type) during an electrical storm. Do not use a telephone to report a gas leak in the area of the leak. (RSFTD213)

8. If you are working with card type 2620 or 2628, read the following:

Attention: Disconnecting or removing the type 2620 or type 2628 cryptographic I/O processor causes the loss of the master encryption key. Read “Important Cryptographic I/O Processor Information” on page 884 before disconnecting or removing the cryptographic I/O processor.

9. If you are working with card type 2624, read the following:

If a retainer **B** is installed on the adapter card in adapter card position A and you need to remove this plug to exchange the adapter card, ensure that you reinstall the retainer.

10. If you are removing a full-size card **C** from the slot, do the following:

- a. Press the two latch surfaces together to release each latch.
- b. Pull on both latches at the same time to remove the card from the slot.

11. If you are removing an adapter card **D** from a full-size card, do the following:

- a. Remove any cables or wrap plugs from the adapter cards.
- b. Press the two latch surfaces together to release the latch.
- c. Rotate the latch downward.
- d. Pull on the latch to remove the adapter card from the full-size card.

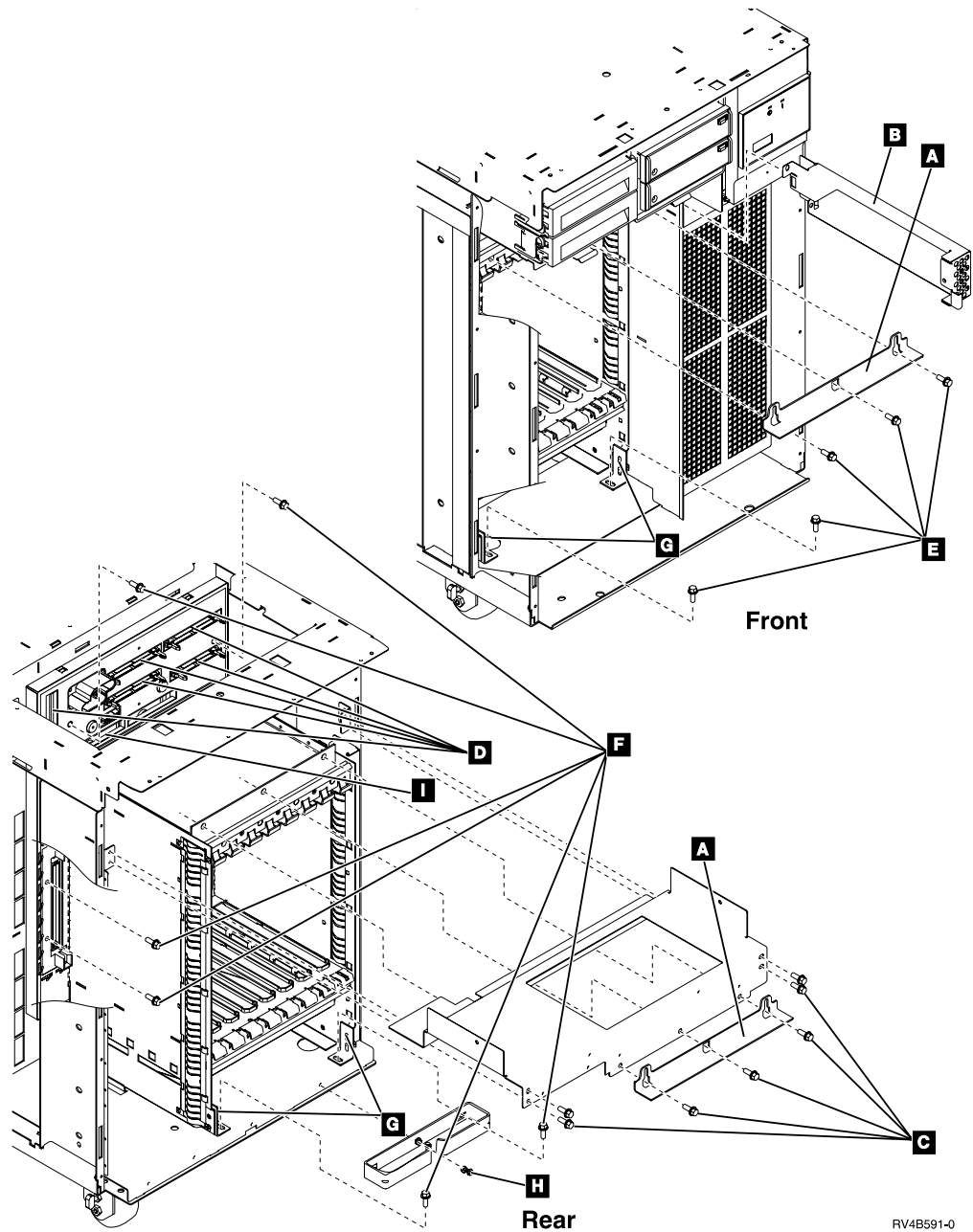
12. Install the card by reversing the removal procedure. Ensure that the cables are installed in the same place they were located originally.

Return to the procedure that sent you here.

After exchanging an item, go to “Verifying the Repair” on page 866.

This ends the procedure.

FC 507x/508x Card Enclosure



1. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord.
3. Remove the front and rear covers (see “Covers” on page 638).
4. Because safety labels may be applied to the card retaining bars **A**, it is important to install the card retaining bars in the same location from which they were removed.
Label or write down the location of the card retaining bars.
5. Remove the card retaining bars.

6. **Attention:** Failure to reinstall the cards in the same slot in which they were located originally may cause data loss.
Label or write down each cable, card, and slot where the card is located.
7. Disconnect all cables that are connected to the cards and remove all of the cards in the card enclosure (see "Cards" on page 615).
8. Remove any internal disk units and disk unit enclosures from the card enclosure (see "FC 507x/508x Disk Unit (Dedicated)" on page 655).
9. Remove the ac module (see "AC Module" on page 594).
10. Remove the removable media enclosures (see "FC 507x/508x Removable Media Enclosure" on page 673).
11. Remove the terminating plug B.
12. Remove the AMD (see "AMDs (Air Moving Devices)" on page 595).
13. Remove the screws C holding the AMD mounting assembly to the frame and remove the AMD mounting assembly.
14. Remove the tape terminating plug I from the rear of the card enclosure.
15. Disconnect the cables D connected to the card enclosure. If storage expansion unit cables are present, ensure that they are pushed out of the way.
16. Remove the screws F holding the rear of the card enclosure to the frame.
17. Remove the screw H holding the cable bracket to the frame and remove the cable bracket.
18. Remove the screws E holding the front of the card enclosure to the frame.
19. Remove screws G and remove the angle brackets. Slide the card enclosure out of the rear of the system.
20. Install the card enclosure by reversing the removal procedure. Ensure that the cards are installed the same slots in which they were located originally.
After exchanging an item, go to "Verifying the Repair" on page 866.
This ends the procedure.

Type 2740, 2748 Card Cache Battery Pack

The following safety notice pertains to the 2740, 2748 Cache Battery Pack.

CAUTION:

The battery is a nickel-cadmium battery. To avoid possible explosion, do not burn. Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations.

In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (RSFTC226)

Attention: All cards are sensitive to electrostatic discharge (see "Appendix C. Working with Electrostatic Discharge-Sensitive Parts" on page 899).

1. Remove the card using the concurrent card removal and replacement procedure for the model or FC that you are working on (see "Chapter 4. Removal and Installation Procedures" on page 593).

Note: If the concurrent card removal procedure fails, then power the system down normally prior to replacing the cache battery pack. (See "Powering On and Powering Off the System or Expansion Tower" on page 868.)

2. Locate the casing A that holds the battery pack. See Figure 23 on page 624.

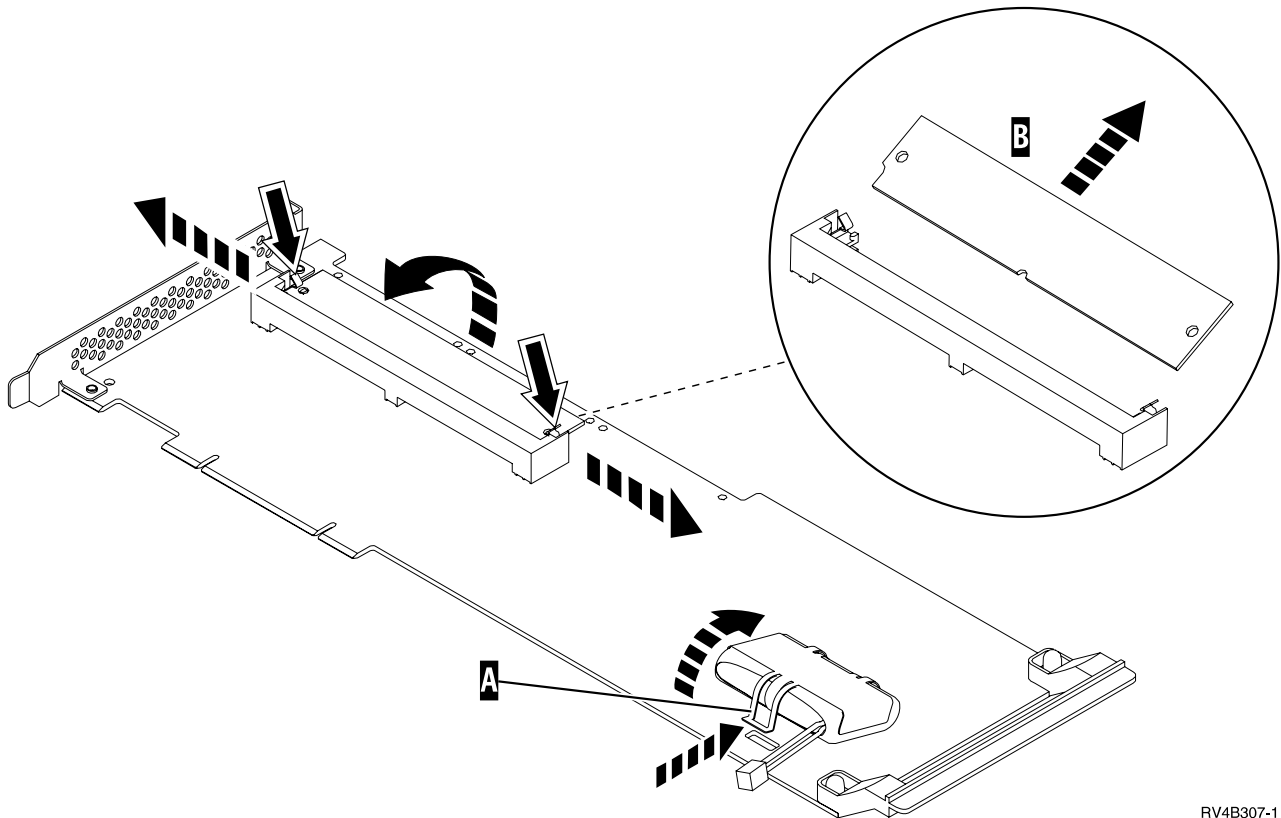
3. Squeeze the casing **A** to remove battery unit from the card.
4. Remove the plug that connects the battery unit and the card.

Note: The plug fits in the board only one way so it can not be inserted incorrectly during the replacement phase.

5. Remove the battery unit from the battery casing.

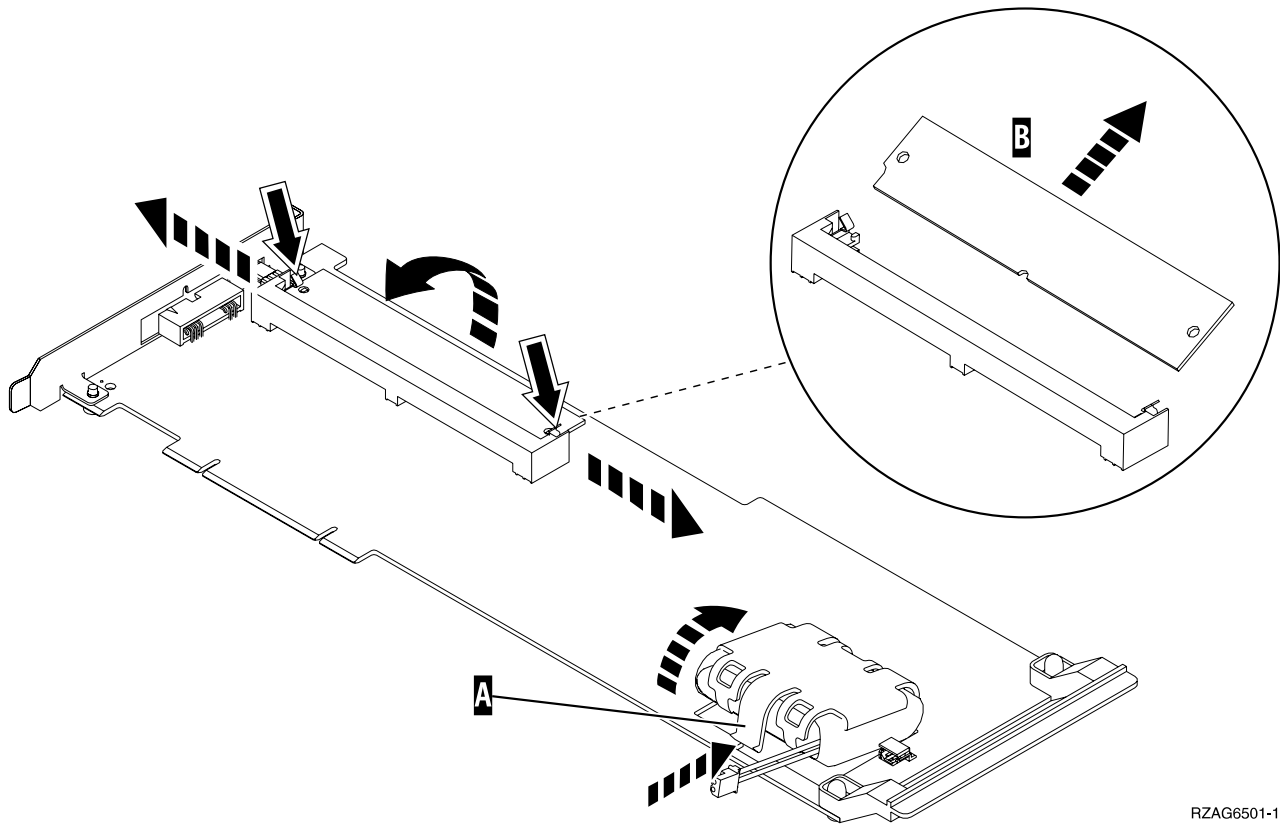
Note: Save the battery casing. The replacement battery pack will not come equipped with a casing.

6. Install the new cache battery pack by reversing the procedure.



RV4B307-1

Figure 22. Cache Battery Pack and Cache Directory Card for Type 2740



RZAG6501-1

Figure 23. Cache Battery Pack and Cache Directory Card for Type 2748

This ends the procedure.

Cache Directory Card, For Type 2740, 2748

Attention: All cards are sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

1. Locate the cache directory card **B**; a small rectangular card mounted on the I/O card. See Figure 22 on page 623 and Figure 23.
2. Spread the tabs on each side of the cache directory card and raise the back of the cache directory card **B** up away from the I/O card. The cache directory card will pivot up about 20°
3. Pull cache directory card out.

Note: To install the replacement cache directory card, the cache directory card should be wiggled into place at a 20° angle before pushing it down and locking the tabs. Be sure that the holes on each side of the cache directory card are filled by the pegs on the cache card to ensure proper seating.

This ends the procedure.

Type 4010 Card Cache Replacement Procedure

Attention: All cards are sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

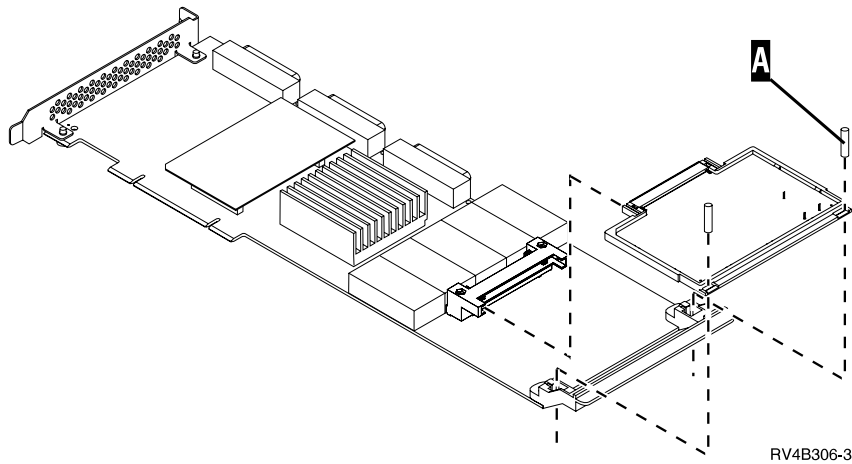


Figure 24. Cache card removal

1. Power off the system. (see “Powering On and Powering Off the System or Expansion Tower” on page 868)
2. Disconnect the power cord from the system or expansion unit.
3. Remove the covers. (See “Covers” on page 638 or if you are working in a FC 5065 or FC 5066 expansion tower see “FC 5065 and FC 5066” on page 639.)
4. Remove the EMC access plate.

Note: When installing this EMC access plate in a system unit, ensure that slotted screws are used to secure the shield to the frame.

5. Disconnect the cables that are connected to the PCI card.

Note: Label the cables to ensure correct installation.

6. Record the location of the card being removed.
7. Remove the screw that holds the card bracket.
8. Pull the card out of the system.
9. Remove the alignment pins from the corners of the cache card A.
10. Pull the cache card out of the connector at the rear of the Storage IOA card.

This ends the procedure.

Type 4700 and 6503 Cache Cards (FC 507x/508x)

Attention: All cards are sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

CAUTION:

This card assembly contains a lithium battery. To avoid possible explosion, do not burn, exchange, or charge the battery. Discard the card assembly as instructed by local regulations for lithium batteries. (RSFTC233)

Parts Catalog References

- None

Procedure

1. Power off the system. (see "Powering On and Powering Off the System or Expansion Tower" on page 868)
2. Disconnect the power cord from the system unit.
3. Remove the front or rear covers (see "Covers" on page 638).
4. Loosen the screws on the card retaining bar.
5. Remove the adapter card from the full-size card by doing the following:
 - a. Press the two latch surfaces together to release the latch.
 - b. Rotate the latch downward.
 - c. Pull on the latch to remove the adapter card from the full-size card.

This ends the procedure.

Type 4758 Battery Replacement Procedure

This procedure demonstrates the proper method for replacing the Type 4758-023 PCI Cryptographic Coprocessor card's batteries.

Note: Two Battery Replacement Kits (PN 09J8199) are required to replace the batteries in the 4758-023 card, since the card contains 4 batteries, and each Battery Replacement Kit contains 2 new batteries. (Individual models of the 4758 PCI Cryptographic Coprocessor family of cards contain either 2 or 4 batteries. For cards that contain 4 batteries, two battery replacement kits must be ordered.)

CAUTION:

The battery is a lithium battery. To avoid possible explosion, do not burn or charge the battery. Exchange only with the IBM-approved part. Discard the battery as instructed by local regulations. (RSFTC227)

1. Remove the 4758 PCI Cryptographic Coprocessor card from the system.
2. Find the location of the 4 lithium batteries. They are located in adjacent holders, with the Battery 2 holder above the J3 connector. Refer to the illustration below.

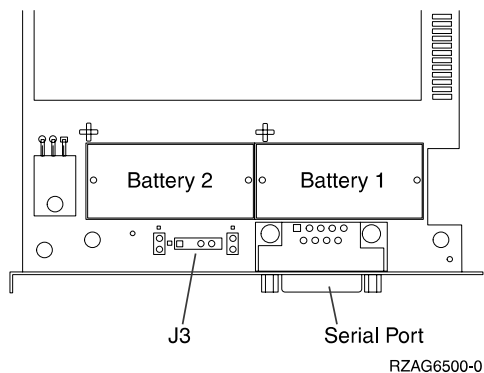


Figure 25. Battery Locations on the 4758 PCI Cryptographic Coprocessor

Note: The 4758-023 card contains 4 batteries, even though only 2 batteries are shown in the figure above. Battery 3 is next to Battery 1, and Battery 4 is next to Battery 2.

3. **Attention:** Any loss of battery power erases data stored in the card's protected memory and renders the card useless.
4. Open both of the battery replacement kits.
5. Insert one of the new batteries into the battery tray provided with the kit.

Note: The battery '+' must be oriented in the battery tray with the same polarity matching the '+' on the tray.

6. Connect the battery tray's cable to the J3 connector on the 4758 card.

Note: This maintains battery power to the card while the new batteries are installed one at a time. Refer to step 3 of this procedure.

7. Remove the 2 battery warning labels which cover both sets of batteries.. Discard the labels.
8. Replace the battery in the Battery 1, 2 and 3 positions with a new battery.

Note: The battery '+' must be oriented in the holder with the same polarity matching the '+' on the holder.

9. Replace the battery in the Battery 4 position with the battery in the battery tray.

Note: The battery '+' must be oriented in the holder with the same polarity matching the '+' on the holder.

10. Remove the battery tray from the J3 connector and discard it.
11. Place one of the new Battery Warning label (PN 04K9421) over the 2 new batteries in Battery positions 1 & 2 which were just installed. Place the other new Battery Warning label over the 2 new batteries in Battery positions 3 & 4 which were just installed.
12. Reinstall the card.

This ends the procedure.

Type 4758 Disablement Procedure

Attention: For security reasons, when replacing the cryptographic coprocessor, use the following procedure.

This procedure demonstrates the proper method for disabling the Type 4758 PCI Cryptographic Coprocessor card. The disablement procedure assures that the contents of the Coprocessor's protected memory are set to zeroes. The cryptographic master key and other data stored in the protected memory will be lost.

CAUTION:

The battery is a lithium battery. To avoid possible explosion, do not burn or charge the battery. Exchange only with the IBM-approved part. Discard the battery as instructed by local regulations. (RSFTC227)

1. Remove the 4758 PCI Cryptographic Coprocessor card from the system.
2. Find the location of the four lithium batteries. They are located in adjacent holders, with the Battery 2 above the J3 connector. Refer to the illustration below.

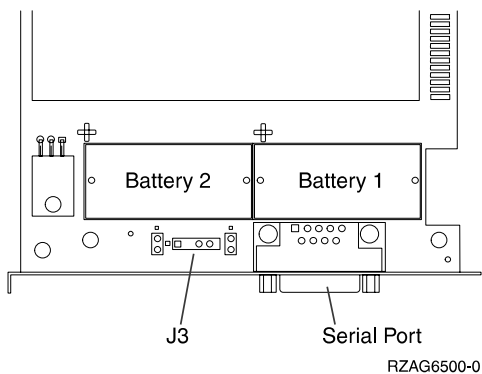


Figure 26. Battery Locations on the 4758 PCI Cryptographic Coprocessor

Note: The 4758-023 card contains 4 batteries, even though only 2 batteries are shown in the figure above. Battery 3 is next to Battery 1, and Battery 4 is next to Battery 2.

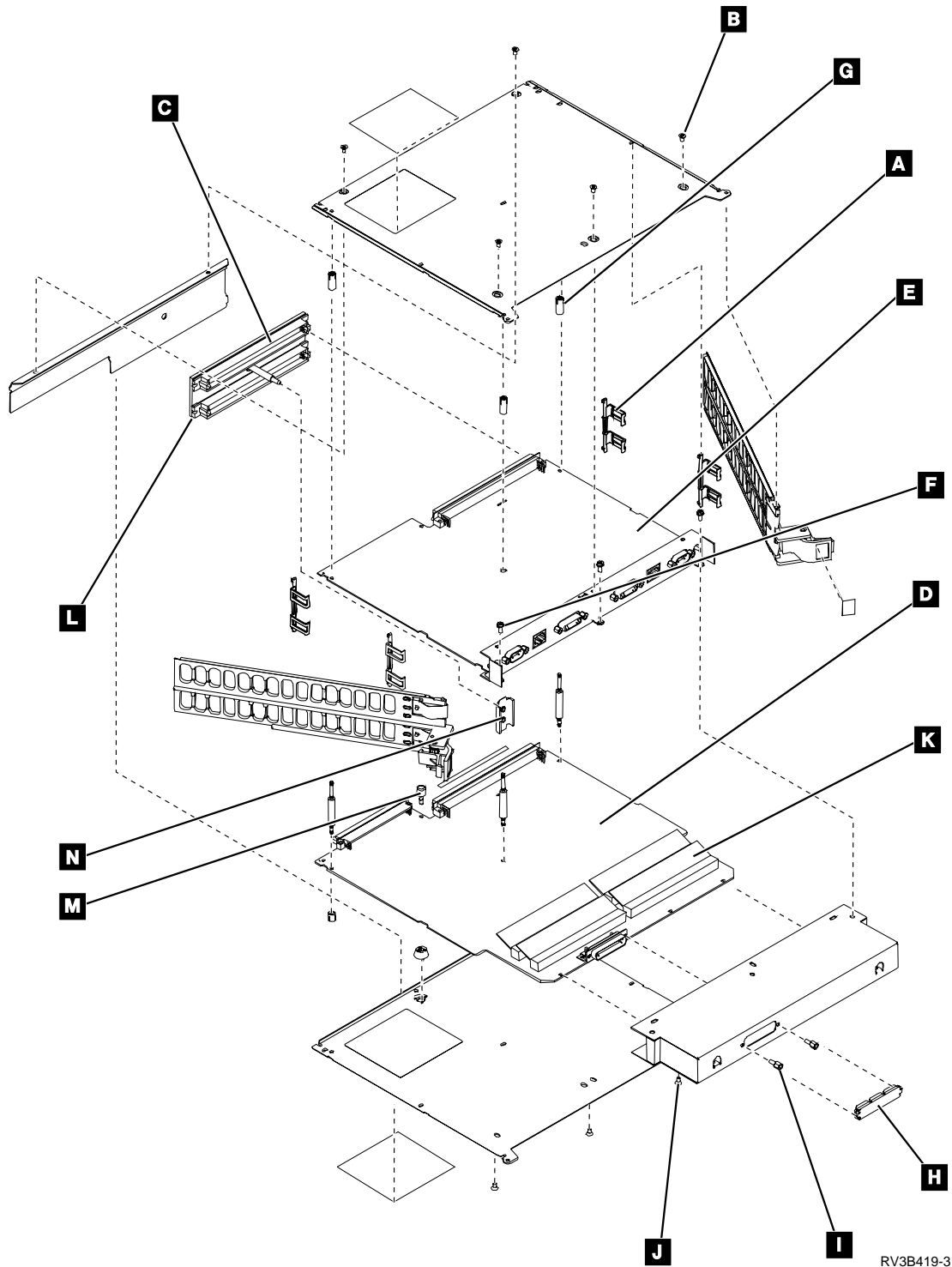
Note: The loss of battery power erases data stored in the card's protected memory and renders the card useless.

3. Remove the battery in the "Battery1" holder (lower right side).
4. Remove the battery in the "Battery2" holder (lower left side).
5. Remove the battery in the "Battery3" holder (upper right side).
6. Remove the battery in the "Battery4" holder (upper left side). When this has been accomplished, the PCI Cryptographic Coprocessor card has been disabled.
7. You can now install the new card.

This ends the procedure.

Type 6506 File Server IOP (FC 507x/508x)

Attention: The memory module is sensitive to electrostatic discharge (see "Appendix C. Working with Electrostatic Discharge-Sensitive Parts" on page 899).



RV3B419-3

1. Remove the file server IOP card from the system (see “Cards” on page 615).
2. Place the card assembly on a flat surface with the latches next to the work surface.
3. Release the four clips A from the rail assemblies. It may be necessary to use a screwdriver to release the clips.
4. Rotate the top and bottom rail assemblies away from the card as shown. Remove the rails by lifting the cover at the hinge points.

5. Remove the clips **A**.

Note: When the clips are installed, the rails must be fully seated against the covers.

6. Remove the three cover screws **B** and the cover.

Do not remove the two screws that attach the cover to the end cover.

7. Remove the crossover connector **C** by doing the following:
 - a. Turn the screw counterclockwise until the crossover connector separates from the processor card **D** and the adapter card **E**.
 - b. Remove the crossover connector.

Attention: When the crossover connector is installed, the corner notch **L** must be located as shown or the card may be damaged.

8. Remove the three screws **F**.
9. Remove the three standoff retainers **G**.
10. Remove the adapter card **E**.
11. Remove the crossover connector bracket **N**.

Note: The connector bracket must be installed in the same direction as shown.

12. Rotate and release **M**.
13. To remove the cover from the I/O processor card, do the following:
 - a. Remove the test port cover **H**.
 - b. Remove the test port connector standoffs **I**.
 - c. Remove the two screws **J** through the access holes in the cover.
14. Slide the I/O processor card out from the cover.

Note: If exchanging the I/O processor card, move the standoffs to new card.

15. To remove the memory module card **K** from the processor card, do the following:
 - a. Push outward on the latches located at the end of the card.
 - b. Pull the card from the card socket.

Note: The memory module card location is marked next to each card socket on the processor card.

16. Install the parts of the file server IOP by reversing the removal procedure. After exchanging an item, go to "Verifying the Repair" on page 866.
This ends the procedure.

Type 6616 Integrated Netfinity Server for AS/400 (FC 507x/508x)

Attention: The memory module is sensitive to electrostatic discharge (see "Appendix C. Working with Electrostatic Discharge-Sensitive Parts" on page 899).

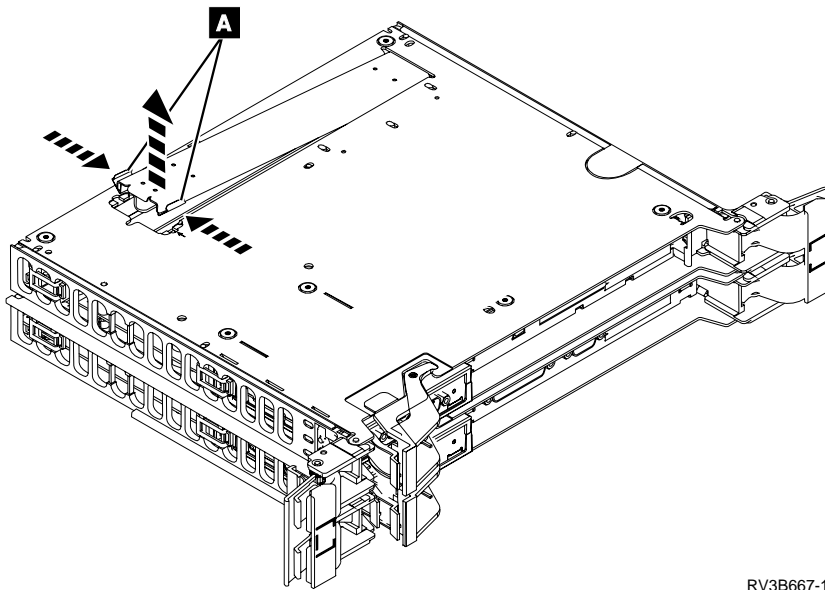
1. Remove the Integrated Netfinity Server card from the system (see "Cards" on page 615). It is a double wide card.
2. Place the card assembly on a flat surface with the door facing up.
3. Release the tabs **A** at one end of the door by pressing inward with a screwdriver or similar object.
4. Remove the door.

5. Remove the memory module(s) by opening the clips on each side and lifting it out.
6. If the failing item was the Integrated Netfinity Server card, install the memory module(s) you removed on the new Integrated Netfinity Server card and install the card by reversing the removal procedure.

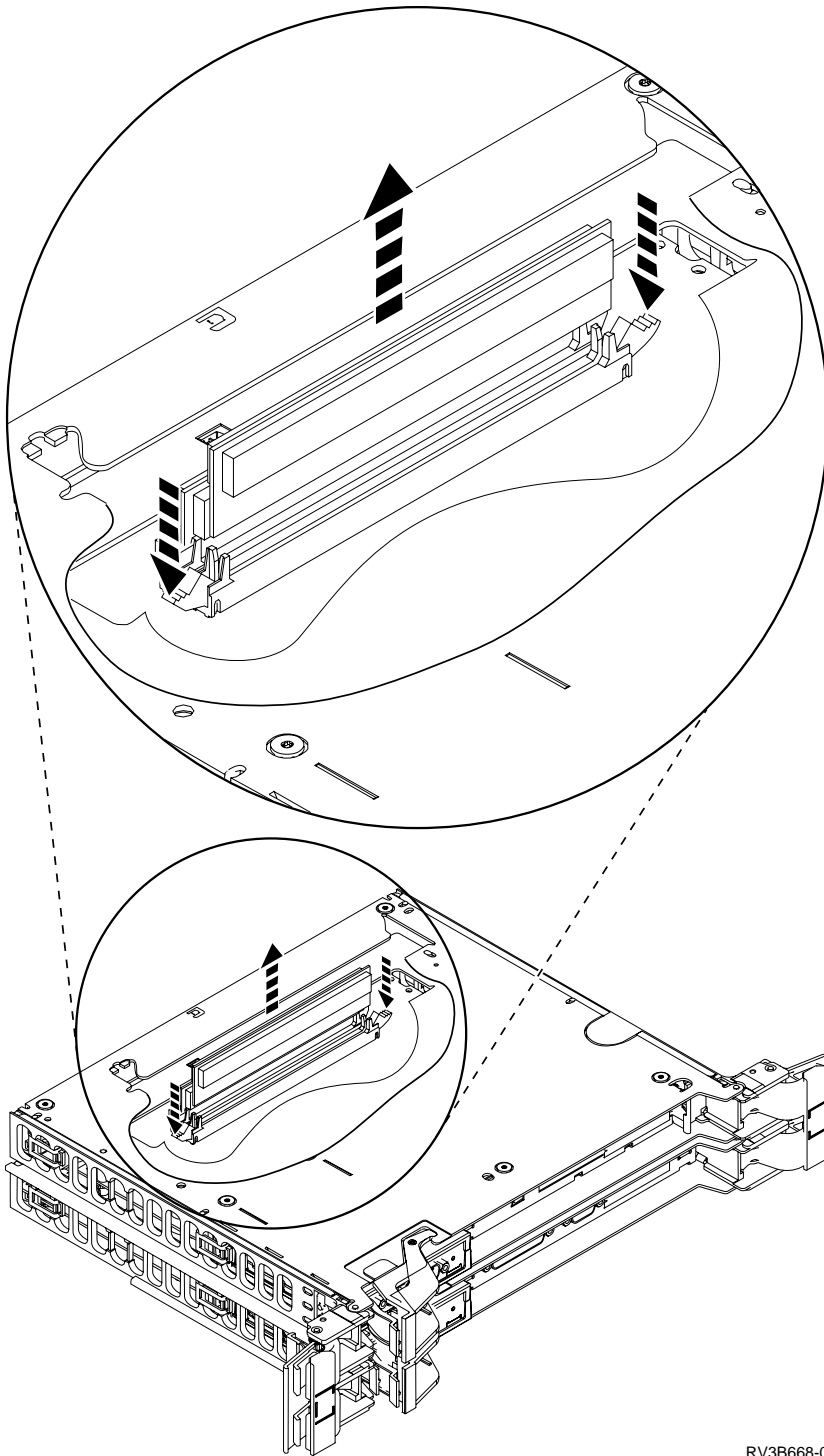
If the failing item was the memory module, install a new memory module on the Integrated Netfinity Server card and install the card by reversing the removal procedure.

After exchanging an item, go to Verifying the Repair.

This ends the procedure.



RV3B667-1



RV3B668-0

Type 6617 Integrated Netfinity Server for AS/400 (FC 507x/508x)

Attention: All cards are sensitive to electrostatic discharge (see "Appendix C. Working with Electrostatic Discharge-Sensitive Parts" on page 899).

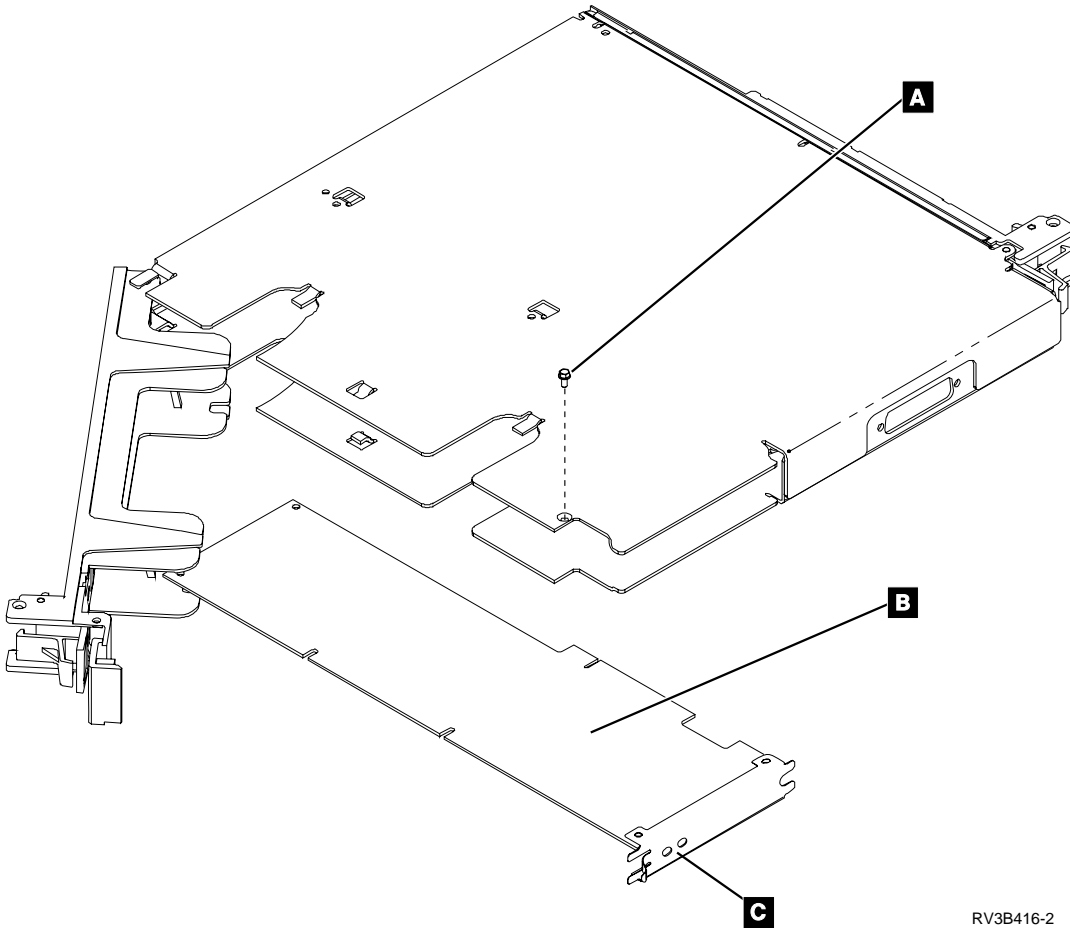
Refer to “Assembly 18: File Server Book Assembly Type 6617” on page 818 when you perform this procedure.

Procedure

1. Remove the Integrated Netfinity Server (triple wide) card from the system (see “Cards” on page 615).
2. Is the failing item the 6617 Integrated Netfinity Server card?
No Yes
↓ Go to step 9.
3. Is the failing item one of the memory modules inside the 6617 Integrated Netfinity Server card?
No Yes
↓ Go to step 14.
4. To replace one of the I/O adapter cards inside the 6617 Integrated Netfinity Server card, remove the 3 screws from the top of the metal plates on the 6617 Integrated Netfinity Server card.
5. Open the top of the Integrated Netfinity Server card by lifting up on the end opposite the edge connector.
6. Remove the mounting screw from the failing I/O adapter card. See the information for “Assembly 18: File Server Book Assembly Type 6617” on page 818.
7. Pull up on the I/O adapter card and remove it from the Integrated Netfinity Server card.
8. Install the card by reversing the removal procedure.
This ends the procedure.
9. To replace the Integrated Netfinity Server card, place the card assembly on a flat surface with the right side of the card (as viewed from the back when the card is installed) facing up.
10. Remove the 12 screws holding the metal plate on.
11. Pull up on the memory module card and remove it from the Integrated Netfinity Server card.
12. Install the memory module card you removed in the new Integrated Netfinity Server card.
13. Install the card by reversing the removal procedure.
This ends the procedure.
14. To replace a memory module, place the card assembly on a flat surface with the right side of the card (as viewed from the back when the card is installed) facing up.
15. Remove the 12 screws from the metal plate.
16. Pull up on the memory module card and remove the module card from the Integrated Netfinity Server card.
17. Remove the failing memory module from the memory module card by releasing the tabs on the end of the memory module and pulling the memory module out. See the information for “Assembly 18: File Server Book Assembly Type 6617” on page 818.
18. Install the memory module card into the new Integrated Netfinity Server card. For location information see “6617” on page 733.
19. Install the card by reversing the removal procedure.
This ends the procedure.

Micro Channel Adapter for a Wireless LAN IOA or IOP (FC 507x/508x)

Attention: The micro channel adapter is sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).



1. Remove the cables C.
 2. Remove the micro channel adapter assembly from the system (see “Cards” on page 615).
 3. Remove the screw A.
 4. Rotate the bottom rail away from the assembly as shown.
 5. Remove the micro channel adapter B.
 6. Install the micro channel adapter assembly by reversing the removal procedure. After exchanging an item, go to Verifying the Repair.
- This ends the procedure.**

SCSI Redrive Card – 9251 Base I/O Tower (FC 507x/508x)

1. Remove rear AMD. Refer to “AMDs (Air Moving Devices)” on page 595 and then return here.
2. Refer to page 806. Remove the terminator retaining bracket.
3. Remove the SCSI terminator.

This ends the procedure.

SPCN Optical Adapter (FC 507x/508x)

Attention: When removing, installing, or holding an optical cable:

- Do not hold the cable with pliers or similar tools.
- Do not bend the cable to less than a 30 cm (12-inch) radius.
- Do not coil the cable to less than a 16 cm (6.3-inch) diameter.
- Do not attach a rope, string, or wire to the cable connectors.

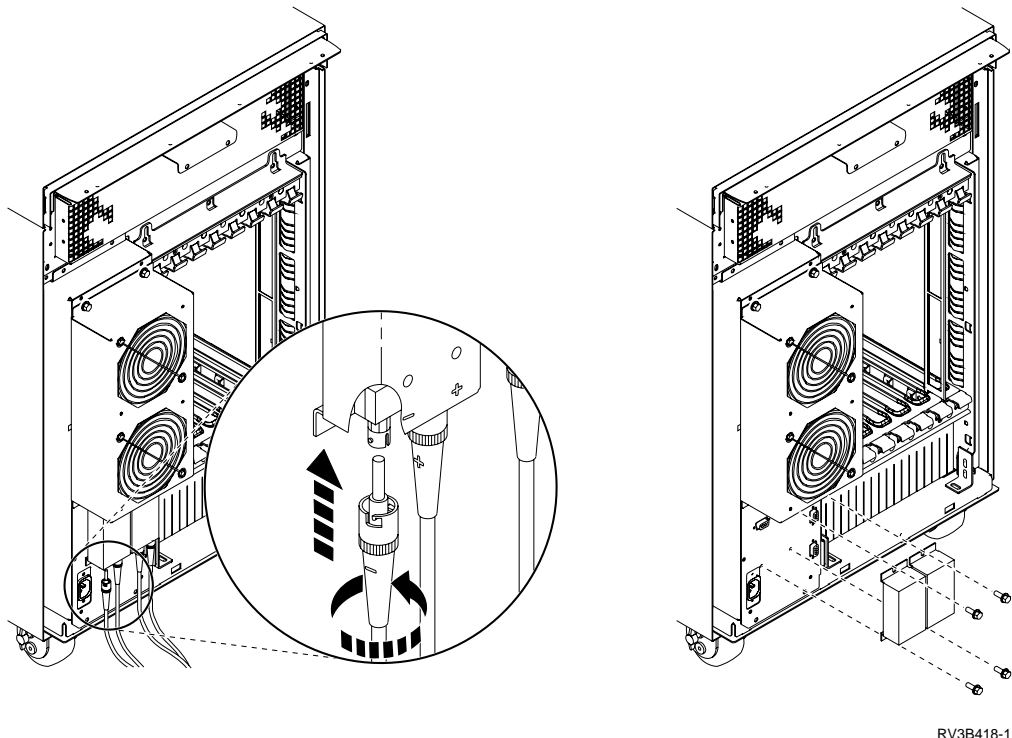
Use care to prevent the optical cable ends from becoming dirty.

Procedure

1. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord.
3. Remove the rear cover (see “Covers” on page 638).
4. Ensure that the SPCN optical cable ends and the SPCN optical adapter terminals are labeled with + and – to ensure that:
 - the + cable end attaches to the + terminal and
 - the – cable end attaches to the – terminal.
5. Disconnect the SPCN optical cable.
6. Remove the mounting screws.
7. Install the SPCN optical adapter by reversing the removal procedure.
Ensure that the SPCN optical cable ends and the SPCN optical adapter terminals are labeled with + and – to ensure that:
 - the + cable end attaches to the + terminal and
 - the – cable end attaches to the – terminal.

After exchanging an item, go to “Verifying the Repair” on page 866.

This ends the procedure.



RV3B418-1

Control Panel Assembly

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687
- “Parts Assemblies” on page 761

Attention: The control panel is sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

FC 5033, FC 5034, FC 5035

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord from the expansion tower.
3. Remove the covers (see “Covers” on page 638).
4. Remove the left side EMC access plate .

Note: When installing this EMC access plate, ensure that slotted screws are used to secure the shield to the frame.

5. Remove the screws holding the front of the control panel face to the front of the frame.

6. A cable runs from the back of the tape drive to the front face of the control panel. Remove that cable at the tape drive.
7. Lift the control panel up slightly and move the lower edge out to clear the frame.
8. Lower the control panel and tilt the face forward.
9. Disconnect the cables running from the control panel to the backplane.
10. Lift the control panel assembly away from the frame.

This ends the procedure.

FC 5065 or FC 5066

1. Power off the expansion tower (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
2. Disconnect the power cord from the expansion tower.
3. Open the front cover. (See "FC 5065 and FC 5066" on page 639.)
4. Pull on the blue handles that are located on each side of the unit and slide it partially out of the tower.
5. Disconnect the control panel cable from the rear of the control panel.
6. Remove the control panel.
7. Install the control panel by reversing the removal procedure. After exchanging an item, go to "Verifying the Repair" on page 866.

This ends the procedure.

FC 5077

1. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
2. Disconnect the power cord.
3. Remove the front cover to access the control panel (see "Covers" on page 638).
4. Disconnect the control panel cables.
5. Remove the control panel.
6. Remove the control panel card.

Note: Return the old keys with the circuit card you removed.

7. The system date and time will need to be set after this procedure is completed. See *AS/400 Service Functions*.

FC 507x/508x

Attention: The control panel is sensitive to electrostatic discharge (see "Appendix C. Working with Electrostatic Discharge-Sensitive Parts" on page 899).

1. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
2. Disconnect the power cord.
3. Remove the front cover (see "Covers" on page 638).
4. Remove the screws.
5. Pull the control panel from the frame.
6. Disconnect the control panel cable from the control panel.
7. Remove the control panel circuit board from the bezel assembly by doing the following:

- a. Remove the screw.
- b. Press the latches to release the circuit card.

This ends the procedure.

Covers

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

Reference the expansion tower you are working on in the following sections of this book:

- “Parts Assemblies” on page 761

FC 5033, FC 5034, and FC 3035

Are you working on an expansion tower with a pedestal?

No **Yes**

↓ The pedestal covers must be removed before removing the system unit covers above them. All the pedestal covers are removed the same way:

Note: The front pedestal cover must be removed first.

Grasp the top of the cover and pull it away from the system unit. Lift the cover up and out of the locating slots in the frame.

Continue with this procedure.

To remove the front cover:

1. Unlock the front cover (notch on key is to the left when unlocked).
2. Slide the cover latches (louvers 2 thru 5) up to unlatch the cover.
3. Grasp along the top, center of the cover and pull it away from the system unit. Lift the cover up and out of the locating slots on the base of the frame.

To remove the rear cover:

Note: Ensure the system is powered off before continuing this procedure. The system powers off immediately when the cable cover is removed. Removing the cable cover without first powering off the system may cause loss of data in main storage.

Lift the cover up and away from the frame.

Remove the top cover:

1. Loosen the cover lock retainer screws at the rear of the system.
2. Slide the cover toward the front of the system.
3. Lift the cover up and away from the frame.

Remove the side cover(s):

1. Slide the cover latches (louvers 2—5) up to expose the side cover screws.
2. Remove the front and rear screws that hold the cover.

Note: When installing the covers, ensure that slotted screws are used to secure the cover to the frame.

3. Lift the cover up and away from the frame.
4. Remove the side EMC cover(s):

Note: Ensure the system is powered off before continuing this procedure. The system powers off immediately when the EMC cover is removed. Removing the EMC cover without first powering off the system may cause loss of data in main storage.

- a. Remove the screws labelled **A** (the **A** is embossed in the metal plate).
- b. Remove the EMC cover from the system.

This ends the procedure.

FC 5065 and FC 5066

Note: The front and rear covers will swing open to a little more than 90 degrees. This makes it possible to replace all FRUs, without having to remove the covers.

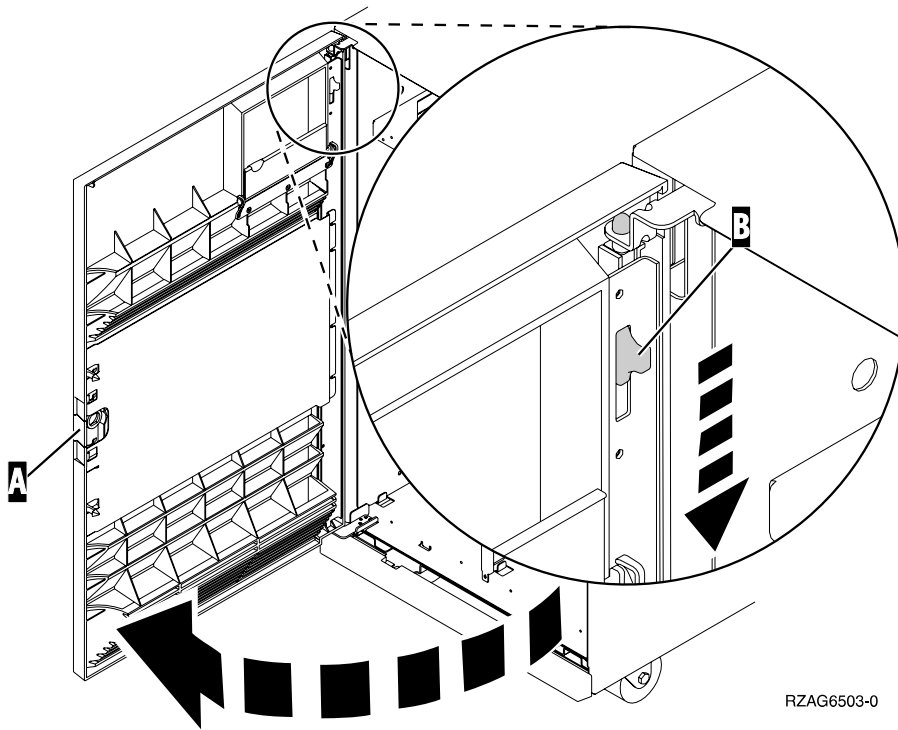
To open the front or rear covers perform the following:

1. Unlock the cover (front only)
2. Release the cover latching mechanism by pushing in on the blue button "**A**" that is located midway along the right edge of the cover.
3. Grasp the top, right corner of the cover and pull it towards you to open it.
4. Do you need to remove the cover?

Yes No

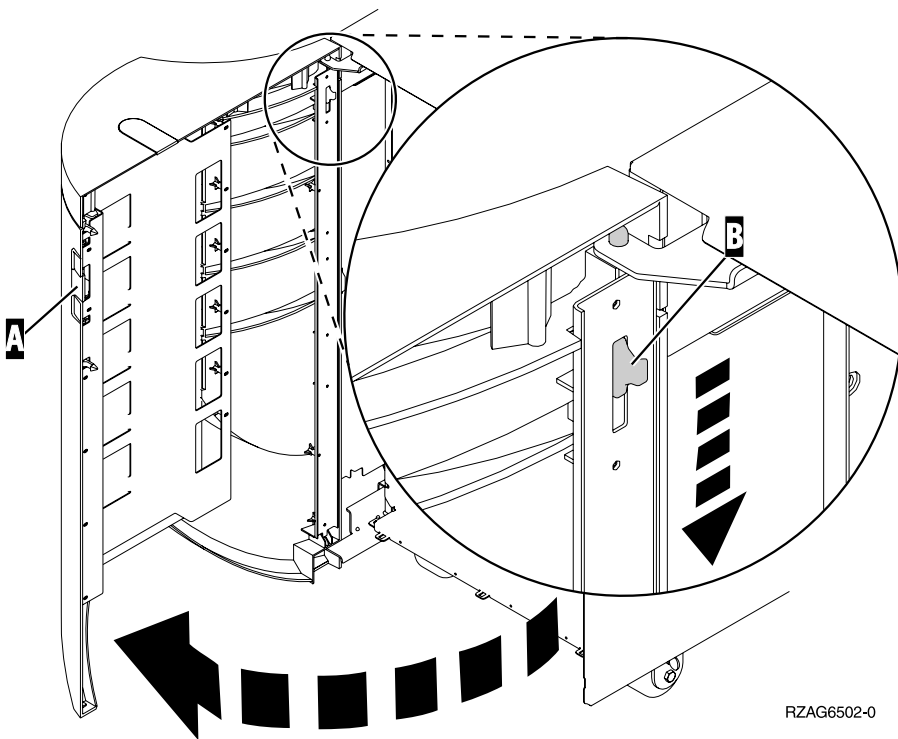
↓ **This ends the procedure.**

5. **To remove the cover:**
 - a. After opening the cover, press down on the lever "**B**" that is located inside along the top, left side of the cover.
 - b. Tilt the top of the cover away from the tower and lift the cover off. See Figure 27 on page 640 and Figure 28 on page 640.



RZAG6503-0

Figure 27. Front Cover - Removal



RZAG6502-0

Figure 28. Rear Cover - Removal

This ends the procedure.

FC 5077 Covers

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

- **To remove the front and rear covers:**

1. Lift up on the cover.
2. Pull the cover out and off.

- **To remove the top cover:**

1. Remove the cover mounting screws.
2. Slide the cover to the front or rear.
3. Lift the cover up and off.

- **To remove the side cover(s):**

1. Remove the front, rear, and top covers.
2. Remove the screws from the front and rear of the side cover.
3. Lift up on the cover.
4. Pull the cover out and off.

FC 507x/508x

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

Remove the front cover by doing the following:

1. Hold the edges of the cover near the top.
2. Pull until the cover comes off the frame.

Remove the rear cover by doing the following:

1. Hold the cover near the top.
2. Lift up on the cover and pull until the cover comes off the frame.

Note: If you do not have disk units in the rear of the storage expansion unit that is on top of the expansion tower, you must also remove the 4 screws that hold the rear plate to the frame.

Remove the top cover by doing the following:

1. Remove the storage expansion unit front and rear covers.
2. Remove the screws and open the storage expansion unit cover **A**
3. **Attention:** Failure to reinstall the disk units in the same slot in which they were originally located may cause data loss.
Label or write down each disk unit and the slot where it is located.
4. Remove all of the disk units and disk unit fillers in the storage expansion unit (see "FC 507x/508x Disk Unit (Dedicated)" on page 655).
5. Remove the screws **B**.
6. Lift the top cover up and off of the frame.

CAUTION:

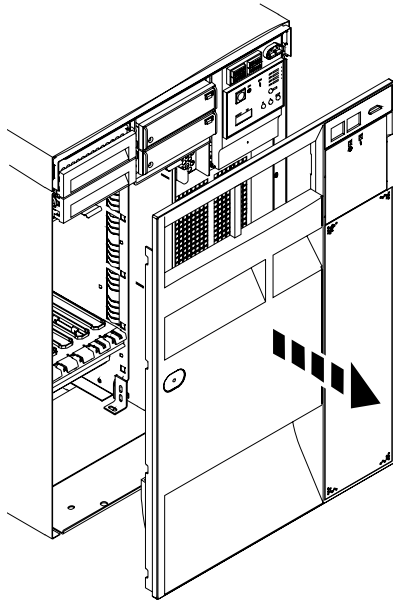
Be careful when removing or installing this part or unit. This part or unit is heavy, but has a weight smaller than 18 kilograms (39.7 pounds). (RSFTC201)

Install the covers by reversing the removal procedure.

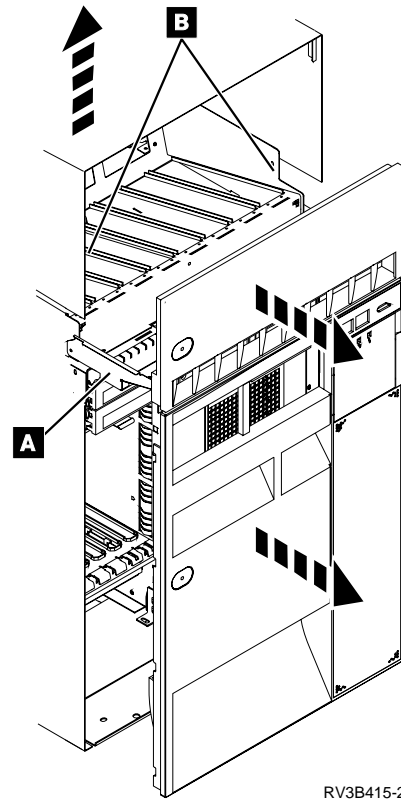
After exchanging an item, go to "Verifying the Repair" on page 866.

This ends the procedure.

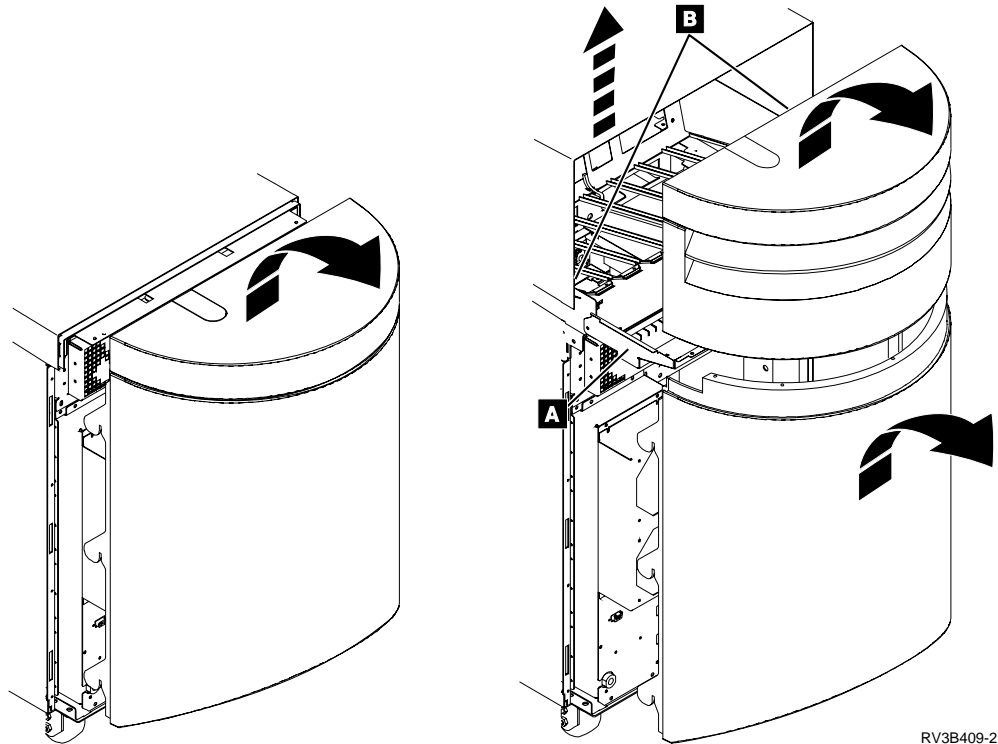
Front View



Back View



RV3B415-2



RV3B409-2

Disk Unit — Dedicated and Concurrent

FC 5033, FC 5034, and FC 5035

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687
- “Parts Assemblies” on page 761

Attention: The disk unit is sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

Attention: Work carefully with the disk unit. Excessive movement may damage the disk unit.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

1. Were you directed here from “Recovery Procedures” on page 837?

Yes **No**

↓ Go to “Recovery Procedures” on page 837.

2. Remove the front covers (see “Covers” on page 638).
3. Remove the EMC access plate.

Note: When installing this EMC access plate, ensure that slotted screws are used to secure the shield to the frame.

4. Are you removing or installing a disk unit by using device concurrent maintenance?

No **Yes**

↓ Go to “Concurrent Maintenance-Removal and Installation”.

5. Go to “Dedicated Maintenance-Removal and installation” on page 646.

Concurrent Maintenance-Removal and Installation

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

To remove a disk unit using concurrent maintenance perform the following:

1. Select System Service Tools (SST). If you cannot get to SST, select DST.
Do not perform a system IPL to get to DST.
2. Select the *Start a Service Tool* option.
3. Select the *Hardware Service Manager* option.
4. Select *Device Concurrent Maintenance* and enter the required information in the information fields.
5. Press the Enter key on the console. After the delay time, the light above the device location will begin flashing. You now have 9 seconds to pull out firmly on the handle and pull the disk unit partially out of the frame.

Attention: If you remove the device when the light is **not** flashing, data may be lost, the disk unit may be damaged, or the backplane may be damaged.

Note: The light above the device location will go off and remain off as soon as the device is no longer making contact with the backplane.

Wait another 5 seconds to allow time for the disk to stop spinning. Then pull the disk unit the remaining way out of the frame.

6. The concurrent repair sequence takes 15 seconds to fully complete.
Does the light start flashing 2 times per second after the concurrent maintenance procedure has completed?

No **Yes**

↓ The disk unit is not the cause of the problem. Schedule the system for dedicated repair in order to replace the disk unit backplane.

See “Expansion Tower Locations and Addresses” on page 687 to find the disk unit backplane for disk units with a location labeled Lxx or Fxx.

For part number information, see “Parts Assemblies” on page 761.

For replacement procedures, see “FC 5033, FC 5034, and FC 5035 Disk Unit Backplane” on page 599.

This ends the procedure.

7. Remove the disk unit from the holder (see “FC 5033, FC 5034, FC 5035 Disk Unit – Removal from Holder” on page 647).

Replace the failing item (either the holder or the disk unit).

This ends the removal procedure.

8. Are you finished with the repair?

No **Yes**

- ↓ Replace the covers that were removed during this procedure and return to the procedure that sent you here.

This ends the procedure.

9. **To insert a disk unit using Device Concurrent Maintenance:**

- a. Install the new disk unit into the holder (see “FC 5033, FC 5034, FC 5035 Disk Unit – Removal from Holder” on page 647).
- b. Select System Service Tools (SST). If you cannot get to SST, select DST.
Do not perform a system IPL to get to DST.
- c. Select the *Start a Service Tool* option.
- d. Select *Device Concurrent Maintenance* and enter the required information in the information fields. **Do not press the Enter key at this time.**
- e. Slide the unit half-way into the mounting frame. **Ensure that the device does not contact the backplane at this time.**
- f. Press the Enter key on the console. After the delay time, the light above the device location will begin flashing 10 times per second. You now have 9 seconds to push in firmly on the handle and push the disk unit completely into the frame.

Attention: If you install the device when the light is **not** flashing, data may be lost, the disk unit may be damaged, or the backplane may be damaged.

Note: The light above the device location will go off and remain off for a few seconds when the device contacts the backplane. Then it should go on and remain on.

10. Did the light above the device go on and remain on?

No Yes

↓ **This ends the install procedure.**

11. Perform the device concurrent maintenance procedure again without physically moving the disk unit.

Did the light above the device go on and remain on?

No Yes

↓ **This ends the install procedure.**

12. Did the light start flashing 2 times per second after the concurrent maintenance procedure was completed?

Yes No

↓ There is a power problem. One of the following has occurred:

- The new disk unit is defective. Repeat this procedure using a different disk unit or disk unit holder.
- The disk unit backplane was damaged during the device concurrent maintenance procedure.

See “Expansion Tower Locations and Addresses” on page 687 to find which backplane corresponds with disk units with a location labeled Lxx or Fxx.

For part number information, see “Parts Assemblies” on page 761.

For replacement procedures, see “FC 5033, FC 5034, and FC 5035 Disk Unit Backplane” on page 599.

- There is a new problem with the power subsystem. Use the new reference code to solve the problem.

This ends the procedure.

13. What you replaced was not the failing item. If you replaced the disk unit, then perform this procedure again and replace the disk unit holder.
If you replaced the disk unit holder, replace the disk unit. Go to "Start Disk Service Here" on page 837 to replace the disk unit.

This ends the procedure.

Dedicated Maintenance-Removal and installation

1. Is the disk unit light at the location you are working with flashing 2 times per second?

No Yes

↓ The problem is either the disk unit holder, the disk unit, or the disk unit backplane.

Go to step 5 of this procedure.

2. **To remove a disk unit using dedicated maintenance perform the following:**
 - a. Power off the system. (see "Powering On and Powering Off the System or Expansion Tower" on page 868)
 - b. Disconnect the power cord from the system unit.
 - c. Pull out firmly on the handle to remove the disk unit.
 - d. Remove the unit from the holder (see "FC 5033, FC 5034, FC 5035 Disk Unit – Removal from Holder" on page 647).
 - e. Replace the failing item (either the holder or the disk unit).
 - f. Install the disk unit into the holder (see "FC 5033, FC 5034, FC 5035 Disk Unit – Removal from Holder" on page 647).
3. Are you finished with the repair?

No Yes

↓ Replace the covers that were removed during this procedure and return to the procedure that sent you here.

This ends the procedure.

4. **To install a disk unit using dedicated maintenance perform the following:**
 - a. Power off the system. (see "Powering On and Powering Off the System or Expansion Tower" on page 868)
 - b. Disconnect the power cord from the system unit.
 - c. Install the disk unit into the holder (see "FC 5033, FC 5034, FC 5035 Disk Unit – Removal from Holder" on page 647).
 - d. Push in firmly on the handle to install the disk unit.
 - e. Replace the covers that were removed during this procedure and return to the procedure that sent you here.

This ends the procedure.

5. You are at this step because you are doing a dedicated repair and the disk unit light is flashing 2 times per second. Perform the following:
 - a. Make a note of the location of the disk unit that has the flashing light.
 - b. Power off the system. (see "Powering On and Powering Off the System or Expansion Tower" on page 868)
 - c. Remove the disk unit that had the flashing light.
 - d. IPL the system to DST. (see "Powering On and Powering Off the System or Expansion Tower" on page 868)

6. Approximately 20 seconds after powering on the system, look at the light at the disk unit location. Is the disk unit light flashing 2 times per second?

No **Yes**

↓ The disk unit you removed was not the failing item. Perform the following:

- a. Power off the system. (see “Powering On and Powering Off the System or Expansion Tower” on page 868)
- b. See “Expansion Tower Locations and Addresses” on page 687 to find which backplane corresponds with disk units with a location labeled Lxx or Fxx.

For part number information, see “Parts Assemblies” on page 761.

For replacement procedures, see “FC 5033, FC 5034, and FC 5035 Disk Unit Backplane” on page 599.

This ends the procedure.

7. The disk unit or the disk unit holder is failing. Perform the following:
- a. Power off the system. (see “Powering On and Powering Off the System or Expansion Tower” on page 868)
 - b. Repeat this procedure to install a new disk unit or disk unit holder.

This ends the procedure.

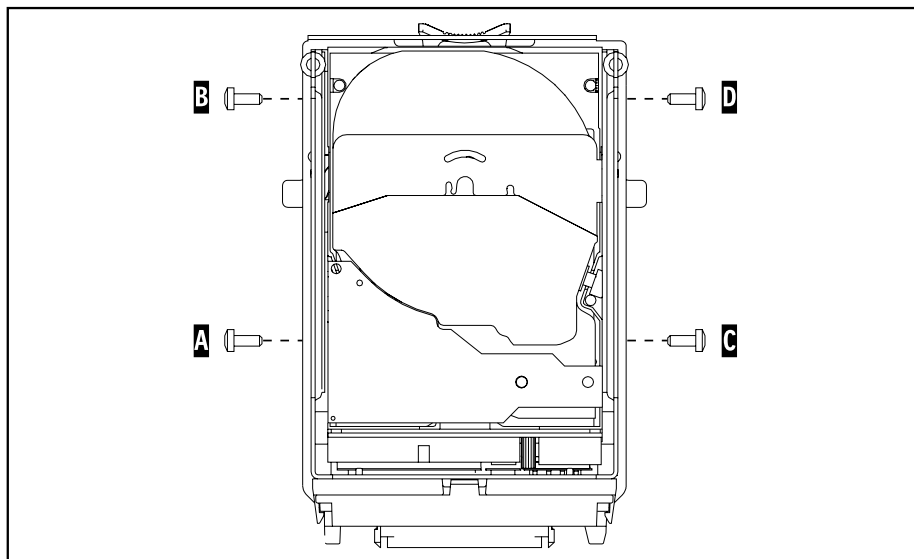
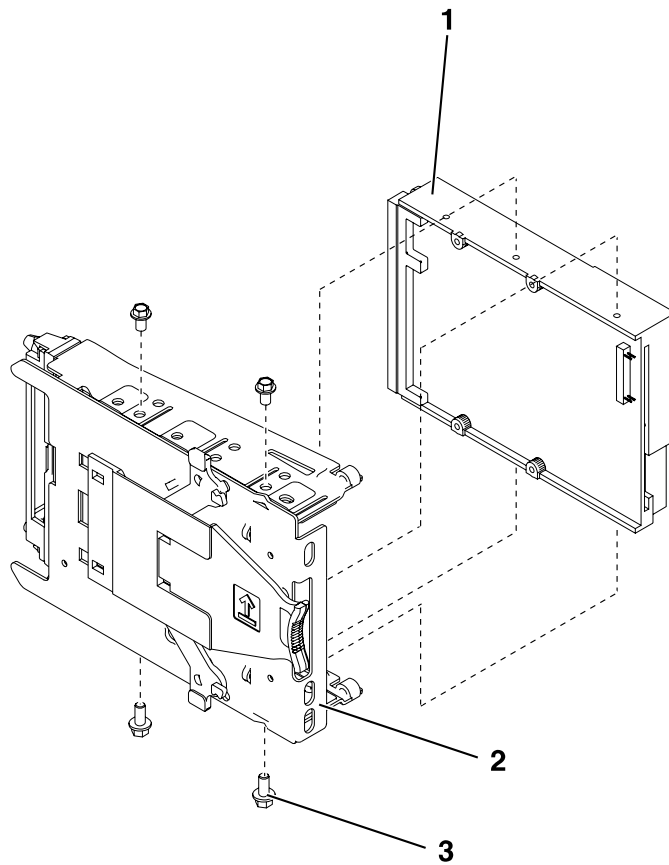
FC 5033, FC 5034, FC 5035 Disk Unit – Removal from Holder

Attention: All cards are sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

FC 5033, FC 5034, FC 5035:



RV4B304-3

1. If necessary, remove the disk unit from the system or expansion unit.
2. Loosen and remove screws **A** and **B** first. Then loosen and remove screws **C** and **D**.

To install disk units into the casing:

1. Tighten and torque the screws in the following sequence (see above diagram).

- A
- B
- C
- D

2. **Do not over tighten!**

This ends the procedure.

FC 5065 or FC 5066

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687
- “Parts Assemblies” on page 761

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Attention: The disk unit is sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

1. Were you directed here from “Recovery Procedures” on page 837?

Yes No

↓ Go to “Recovery Procedures” on page 837.

2. After you have determined the location of the disk unit to replace, remove the front covers for access (see “FC 5065 and FC 5066” on page 639).
3. Remove the EMC access plate that is over the location of the disk unit that you are removing. For location information, see “FC 5065, FC 5066 – Expansion Tower” on page 705.
4. Are you removing or installing a disk unit using concurrent maintenance?

No Yes

↓ Perform “Concurrent Maintenance-Removal and Installation”.

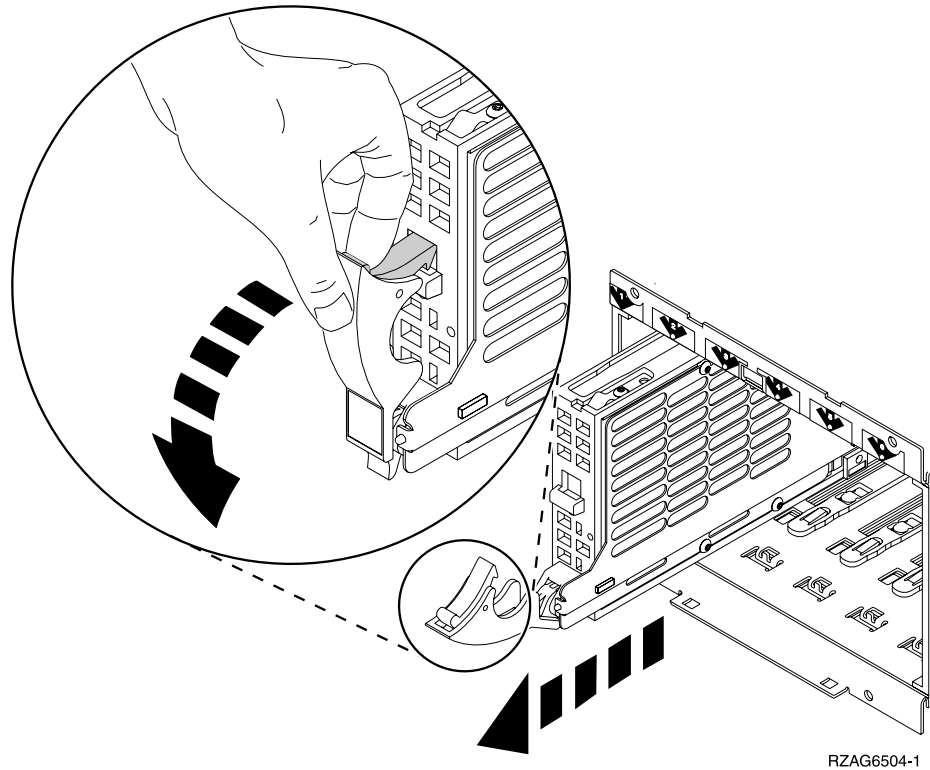
5. Go to “Dedicated Maintenance-Removal and Installation” on page 651.

Concurrent Maintenance-Removal and Installation

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

1. **To remove a disk unit using concurrent maintenance perform the following:**
 - a. Select System Service Tools (SST). If you cannot get to SST, select DST.
Do not perform a system IPL to get to DST.
 - b. Select the *Start a Service Tool* option.
 - c. Select the *Hardware Service Manager* option.
 - d. Select *Device Concurrent Maintenance* and enter the required information in the information fields.
 - e. Press the Enter key on the console. After the delay time, the light above the device location will begin flashing. You now have 9 seconds to pinch the two surfaces of the latching mechanism together and rotate the handle of the disk unit towards you. Pull the disk unit partially out of the tower.

Attention: If you remove the device when the light is **not** flashing, data may be lost, the disk unit may be damaged, or the backplane may be damaged.



Note: The light above the device location will go off and remain off as soon as the device is no longer making contact with the backplane.

Wait another 5 seconds to allow time for the disk to stop spinning. Then pull the disk unit the remaining way out of the tower.

2. Are you finished with the repair?

No **Yes**

↓ Replace the covers that were removed during this procedure and return to the procedure that sent you here.

This ends the procedure.

3. To install a disk unit using concurrent maintenance perform the following:

a. Select System Service Tools (SST). If you cannot get to SST, select DST.

Do not perform a system IPL to get to DST.

b. Select the *Start a Service Tool* option.

c. Select the *Hardware Service Manager* option.

d. Select *Device Concurrent Maintenance* and enter the required information in the information fields. **Do not press the Enter key at this time.**

e. Slide the unit half-way into the tower. **Ensure that the device does not contact the backplane at this time.**

f. Press the Enter key on the console. After the delay time, the light above the device location will begin flashing. You now have 9 seconds to insert the disk unit. Put the disk unit part way into the desired slot and rotate the

handle of the disk unit towards you. Then push the disk unit completely into the slot and rotate the handle towards the disk unit to latch it into the slot.

Attention: If you install the device when the light is **not** flashing, data may be lost, the disk unit may be damaged, or the backplane may be damaged.

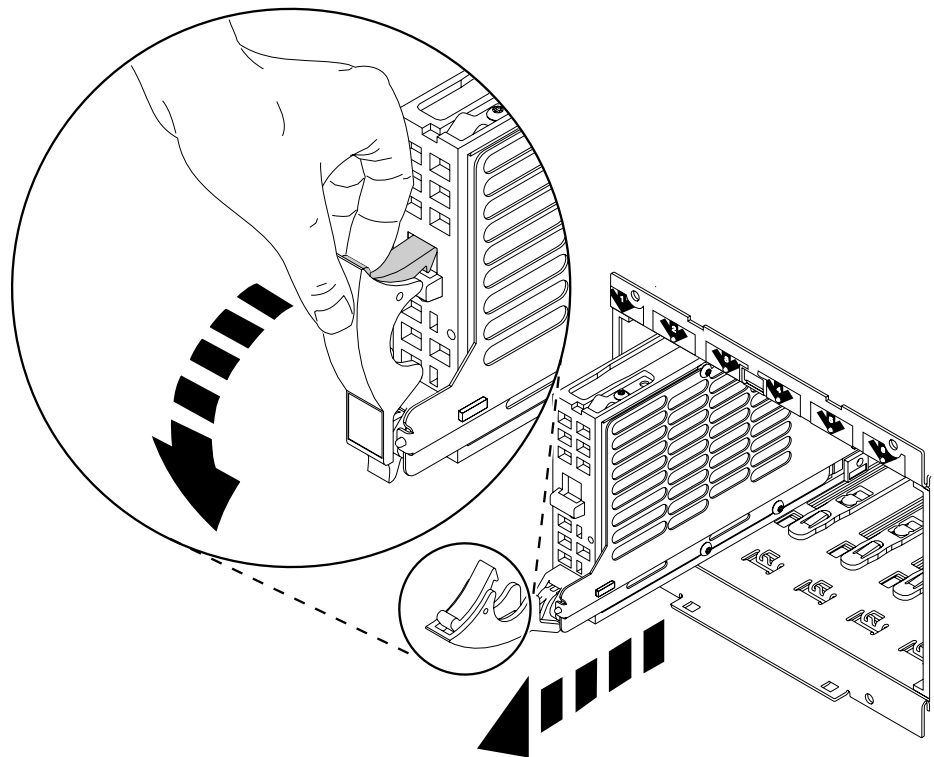
Note: The light above the device location will go off and remain off for a few seconds when the device contacts the backplane. Then it should go on and remain on.

- g. Replace the covers that were removed during this procedure and return to the procedure that sent you here.

This ends the procedure.

Dedicated Maintenance-Removal and Installation

1. To remove a disk unit using dedicated maintenance perform the following:
 - a. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
 - b. Disconnect the power cord.
 - c. To remove the disk unit, pinch the two surfaces of the latching mechanism together and pull the handle towards you to release the disk unit from the slot.
 - d. Remove the unit from the tower.



2. Are you finished with the repair?

No **Yes**

- ↓ Replace the covers that were removed during this procedure and return to the procedure that sent you here.

This ends the procedure.

3. **To Install a disk unit using dedicated maintenance perform the following:**
 - a. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
 - b. Disconnect the power cord.
 - c. Put the disk unit part way into the desired slot and rotate the handle of the disk unit towards you.
 - d. Push the disk unit completely into the slot and rotate the handle towards the disk unit to latch it into the slot.
 - e. Replace the covers that were removed during this procedure and return to the procedure that sent you here.

This ends the procedure.

FC 507x/508x Disk Unit (Concurrent)

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

Attention: The disk unit is sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

Attention: Work carefully with the disk unit. Excessive movement may damage the disk unit.

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that owns the disk unit. (See “Determining if the System Has Logical Partitions” on page 875.)

1. Are you here to remove a disk unit using concurrent maintenance?

Yes No

↓ Go to “FC 507x/508x Removable Media (Concurrent)” on page 670.

This ends the procedure.

2. Data may need to be saved before exchanging a disk unit.
Did you come here from “Start Disk Service Here” on page 837?

Yes No

↓ Go to “Start Disk Service Here” on page 837.

3. Do not power off the system.
4. Remove the front or rear cover (see “Covers” on page 638).
5. Are you removing a disk unit in a storage expansion unit or in a rear disk unit enclosure?

Yes No

↓ Go to step 7 on page 653 of this procedure.

6. You are removing a disk unit in a storage expansion unit or in a rear disk unit enclosure. Do the following:
 - a. Remove the screws.
 - b. Open the storage expansion unit cover.
 - c. Select System Service Tools (SST).

If you cannot get to SST, select DST (see “Accessing Dedicated Service Tools” in the *AS/400 Service Functions*).

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

- d. On the Service Tools display, select the *Start a service tool* option (see the *AS/400 Service Functions*).
- e. Select the *Hardware Service Manager* option on the Start a Service Tool display.
- f. Select *Concurrent Maintenance* from the Hardware Service Manager display and follow the instructions to remove a disk unit. Light **A** will be off and light **B** will be on for about 8 seconds. Three 8-second periods will occur about 15 seconds apart. See “Disk Unit Concurrent Maintenance” in the *AS/400 Service Functions* book for more information.
- g. **Attention:** If you remove the disk unit when light **A** is on or light **B** is off, data may be lost and the disk unit and the storage expansion unit may be damaged.

When the light **A** is off and light **B** is on, press the two latch surfaces together, pull the latch completely down, and pull the tray out a little bit. After another 15 seconds (long enough for the drive to stop spinning), remove the disk unit from the system.

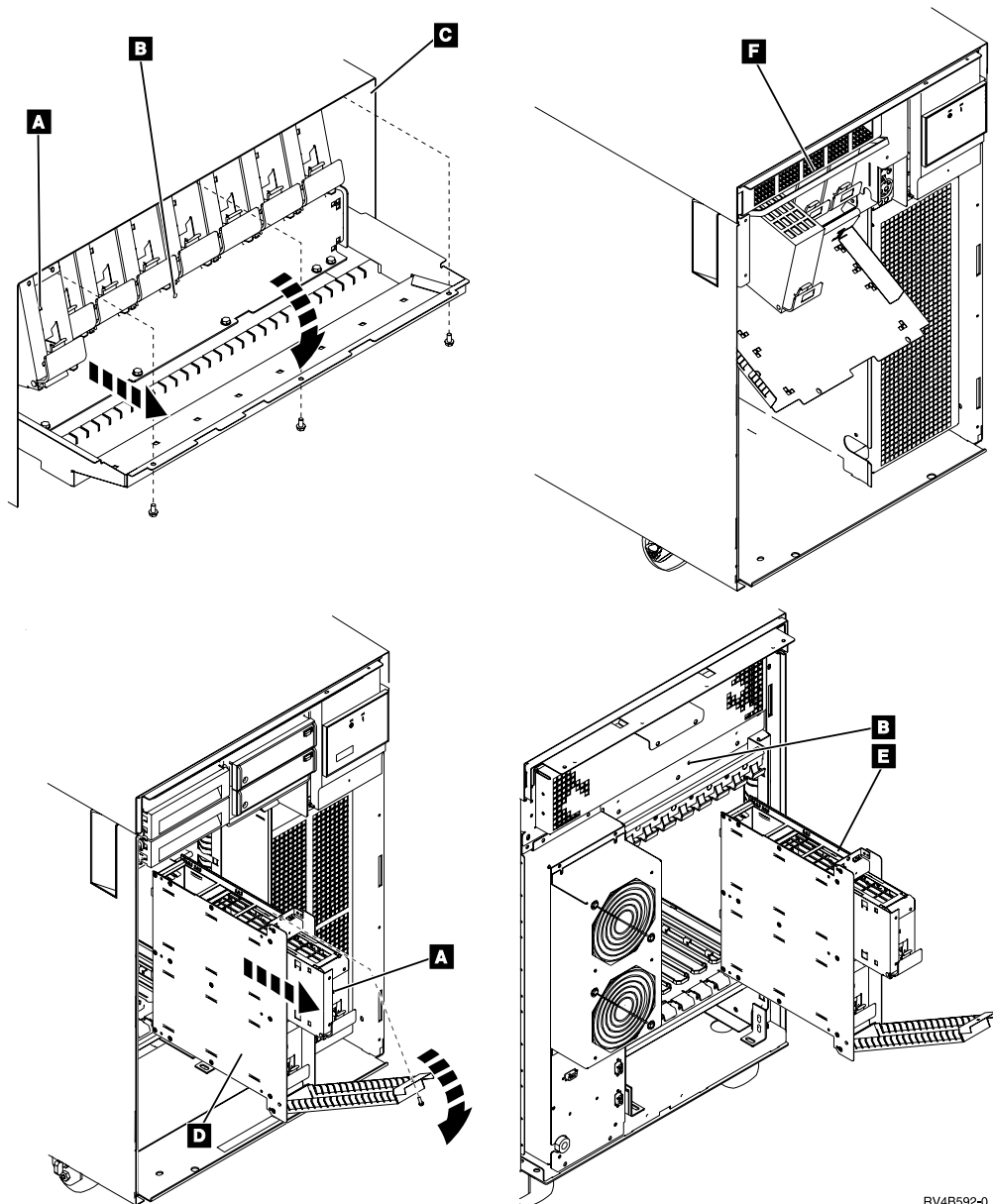
Go to step 8 on page 654 of this procedure.

7. You are removing a disk unit in a disk unit enclosure **D** or in an upper disk unit enclosure **F**. Do the following:
 - a. Remove the screw from the disk unit enclosure cover.
 - b. Pull the disk unit enclosure cover down as shown.
 - c. Pivot the retainer bar out of the way.
 - d. Select System Service Tools (SST).

If you cannot get to SST, select DST (see “Accessing Dedicated Service Tools” in the *AS/400 Service Functions*).

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

- e. On the Service Tools display, select the *Start a service tool* option (see the *AS/400 Service Functions*).
- f. Select the *Hardware Service Manager* option on the Start a Service Tool display.
- g. Select *Concurrent Maintenance* from the Hardware Service Manager display and follow the instructions to remove a disk unit. Light **A** will be off and 1xxx 02xx will be shown in the Function/Data display on the control panel for about 8 seconds. Three 8-second periods will occur about 15 seconds apart. See “Disk Unit Concurrent Maintenance” in the *AS/400 Service Functions* book for more information.
- h. Continue with step 7i of this procedure.



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- i. **Attention:** If you remove the disk unit when light A is on or 1xxx 02xx is not shown in the Function/Data display on the control panel, data may be lost and the disk unit and the disk unit enclosure may be damaged.

When the light A is off and 1xxx 02xx is shown in the Function/Data display on the control panel, press the two latch surfaces together, pull the latch completely down, and pull the tray out a little bit. After another 15 seconds (long enough for the drive to stop spinning), remove the disk unit from the system.

8. To remove the disk drive and logic card from the tray, go to "FC 507x/508x Disk Unit – Removal from Tray" on page 657.
9. Are you installing a disk unit in a storage expansion unit C or in a rear disk unit enclosure E?

Yes No

↓ Go to step 11 on page 655 of this procedure.

10. You are installing a disk unit in a storage expansion unit **C** or in a rear disk unit enclosure **E**. Do the following:
 - a. Select System Service Tools (SST).

If you cannot get to SST, select DST (see “Accessing Dedicated Service Tools” in the *AS/400 Service Functions*).

Note: Do not IPL the system to get to DST.
 - b. On the Service Tools display, select the *Start a service tool* option (see the *AS/400 Service Functions*).
 - c. Select the *Hardware Service Manager* option on the Start a Service Tool display.
 - d. Select *Concurrent Maintenance* from the Hardware Service Manager display and follow the instructions to install a disk unit. Light **B** will be on for about 8 seconds. Three 8-second periods will occur about 15 seconds apart.
 - e. **Attention:** If you install the disk unit when light **B** is off, data may be lost. When the light **B** is on, install and latch the disk unit.
 - f. Close the storage expansion unit cover.
 - g. Install the screws.

Return to the procedure that sent you here.

This ends the procedure.

11. You are installing a disk unit in a disk unit enclosure **D** or in an upper disk unit enclosure **F**. Do the following:
 - a. Select System Service Tools (SST).

If you cannot get to SST, select DST (see “Accessing Dedicated Service Tools” in the *AS/400 Service Functions*).

Note: Do not IPL the system to get to DST.
 - b. On the Service Tools display, select the *Start a service tool* option (see the *AS/400 Service Functions*).
 - c. Select the *Hardware Service Manager* option on the Start a Service Tool display.
 - d. Select *Concurrent Maintenance* from the Hardware Service Manager display and follow the instructions to install a disk unit. 1xxx 01xx will be shown in the Function/Data display on the control panel for about 8 seconds. Three 8-second periods will occur about 15 seconds apart.
 - e. **Attention:** If you install the disk unit when 1xxx 01xx is not shown in the Function/Data display on the control panel, data may be lost. When 1xxx 01xx is shown in the Function/Data display on the control panel, install and latch the disk unit.
 - f. Close the disk unit enclosure cover.
 - g. Install the screw in the disk unit enclosure cover.

Go to the procedure that sent you here and continue.

This ends the procedure.

FC 507x/508x Disk Unit (Dedicated)

Attention: The disk unit is sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

Attention: Work carefully with the disk unit. Excessive movement may damage the disk unit.

1. Before exchanging a disk drive, you must attempt to save customer data. If you did not come to this procedure from Recovery Procedures, go to "Start Disk Service Here" on page 837.
2. Power off the system unit or the expansion tower where the disk unit is located. (See "Powering On and Powering Off the System or Expansion Tower" on page 868.)
3. Disconnect the power cord.
4. Remove the cover (see "Covers" on page 638).
5. If the disk unit you are working with is in a storage expansion unit, do the following:
 - a. Remove the screws.
 - b. Pull the cover down as shown.

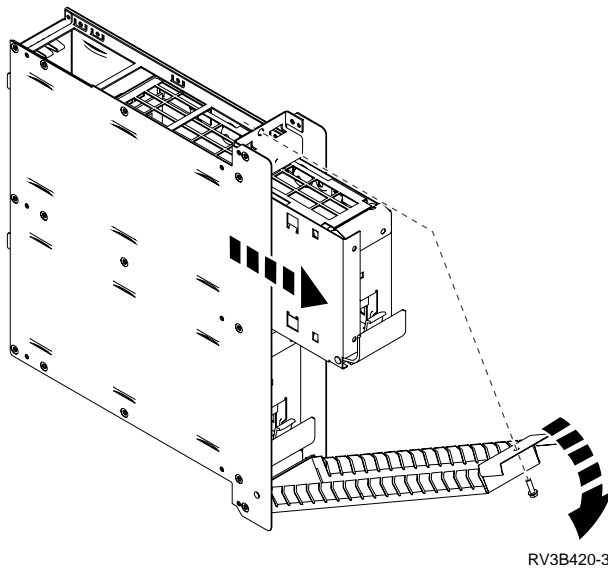
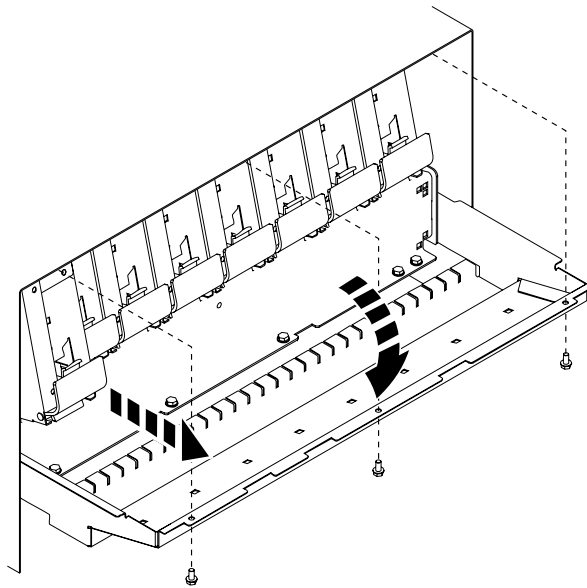
Go to step 8 of this procedure.

6. If the disk unit you are working with is in an upper disk unit enclosure, do the following:
 - a. Remove the screws.
 - b. Pull the cover down as shown.
 - c. Pivot the retainer bar out of the way.

Go to step 8 of this procedure.

7. If the disk unit you are working with is in a disk unit enclosure or in a rear disk unit enclosure, do the following:
 - a. Remove the screw from the disk unit enclosure cover.
 - b. Pull the disk unit enclosure cover down as shown.
8. Press the two latch surfaces together, pull the latch down, and remove the disk unit.
9. To remove the disk drive and logic card from the tray, go to "FC 507x/508x Disk Unit – Removal from Tray" on page 657.
10. Install the disk unit by reversing the removal procedure.

This ends the procedure.



FC 507x/508x Disk Unit – Removal from Tray

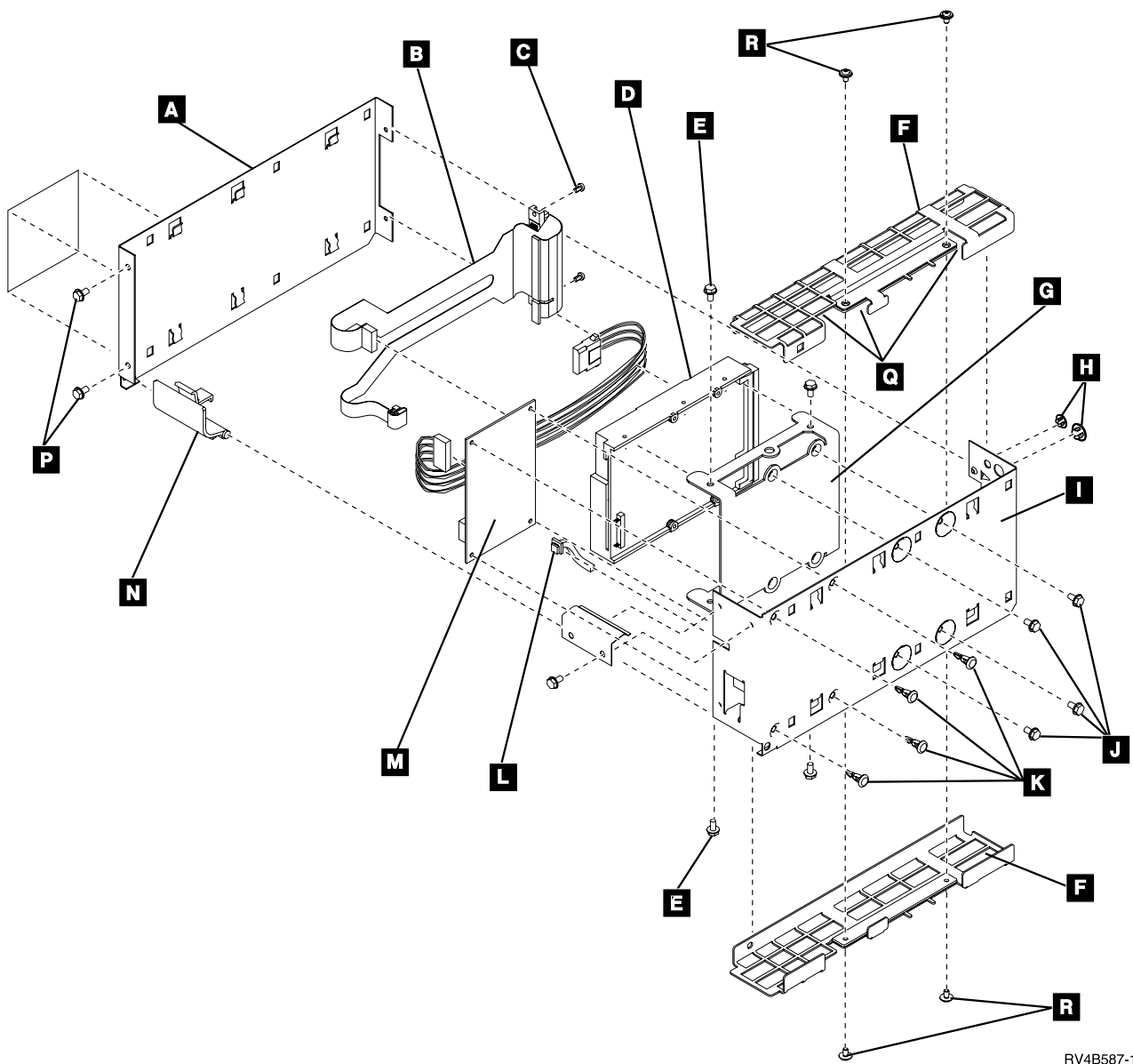
Attention: All cards are sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

1. If necessary, remove the disk unit from the system or expansion unit. (See the disk unit procedure in “Chapter 4. Removal and Installation Procedures” on page 593.)
2. Orient the disk tray with the blue handle towards you and to the left. The tray should be lying horizontally with the shield covers (grids) on each side.

3. Refer to Figure 29 for the following steps.



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Figure 29. Disk unit holder assembly

4. Loosen the screws **C** on the connector.
5. Loosen the screws **P** on the blue handle end. These screws will be removed in a later step.
6. If the tray has two screws on each of the grid sides **R**, remove them.
7. Remove the grid covers by doing the following:
 - a. Insert the tip of a screwdriver at points **Q**.
 - b. Rotate the screwdriver to push the cover away from the sides.
 - c. Repeat this for the other grid.
8. Remove the screws **P** on the blue handle end.
9. Remove the disk tray side cover and blue handle. Note the position of the handle before removing. Leave the connector on the casing.

10. To remove the disk unit from the open tray assembly, do the following:

Note: The disk unit and flex cable may not be exactly the same type as shown in Figure 29 on page 658.

- a. Disconnect the power and address cables from the power card.
- b. Disconnect the power and signal cables from the disk unit.
- c. While supporting the disk unit, remove the 4 screws that secure the disk unit to the holder.
- d. Lift the disk unit from the case.
- e. Some disk units have a bracket installed on them. Refer to Figure 29 on page 658. Remove screws **H** and remove bracket **G**.
- f. To exchange the disk unit logic card, use the instructions included with the new disk unit logic card FRU.

This ends the procedure.

To install disk units into the casing:

- Assemble the disk unit into the tray by reversing the steps above.
- **Important:** Tighten and torque the screws in the following sequence (see Figure 29 on page 658).
 - **A**
 - **B**
 - **C**
 - **D**
- **Do not over tighten!**

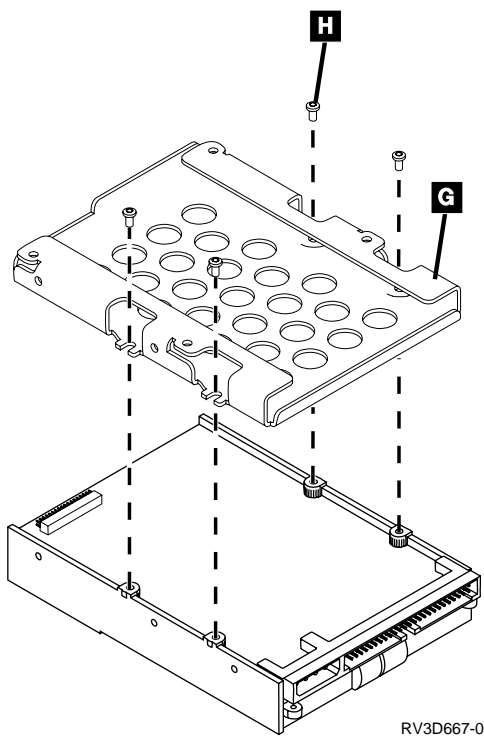


Figure 30. Disk unit case assembly

This ends the procedure.

Power Distribution Boards

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687
- “Parts Assemblies” on page 761

FC 5033, FC 5034, and FC 5035 on the base side of the tower

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord from the expansion tower.
3. Remove the covers (see “Covers” on page 638).
4. Remove the EMC access plates.

Note: When installing the system unit EMC access plate, ensure that slotted screws are used to secure the shield to the frame.

5. Remove the 845 Watt power supply in location A01 (see “FC 5033, FC 5034, and FC 5035 — 845 Watt (P01 and P02)” on page 663).
6. Remove the pedestal AMD (see “FC 5033, FC 5034, and FC 5035” on page 595).
7. Remove the power distribution cables from the sockets at the front of the power bus assembly.
8. Remove the screws that hold the power bus.

Note: When installing the power bus, do not over tighten these screws. The power connectors are self-aligning and must be free to move as necessary.

9. Remove the screws that hold the bus.

Do not remove any of the recessed screws.

10. Pull the power distribution assembly out through the pedestal.

This ends the procedure.

FC 5033, FC 5034, and FC 5035 on the SPD expansion side of the tower

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord from the expansion tower.
3. Remove the covers (see “Covers” on page 638).
4. Remove the EMC access plates.

Note: When installing the expansion unit EMC access plate, ensure that slotted screws are used to secure the shield to the frame.

5. Remove the SPD backplane (see “FC 5033, FC 5034, and FC 5035 Expansion SPD Backplane” on page 599).
6. Remove the 650 Watt power supply in location A02 and A03 (see “FC 5033, FC 5034, and FC 5035 — 650 Watt (P03 and P04)” on page 663).
7. Remove the 845 Watt power supply in location A04 (see “FC 5033, FC 5034, and FC 5035 — 845 Watt (P01 and P02)” on page 663).
8. Remove the pedestal AMD (see “AMDs (Air Moving Devices)” on page 595).

9. Remove the pedestal AMD mounting bracket.
10. Remove the power distribution cables from the sockets at the front of the bus assembly.
11. Remove the screws that hold the power bus.

Note: When installing the power bus, do not over tighten these screws. The power connectors are self-aligning and must be free to move as necessary.

12. Remove the screws that hold the power bus.
13. Pull the power distribution assembly out through the pedestal.

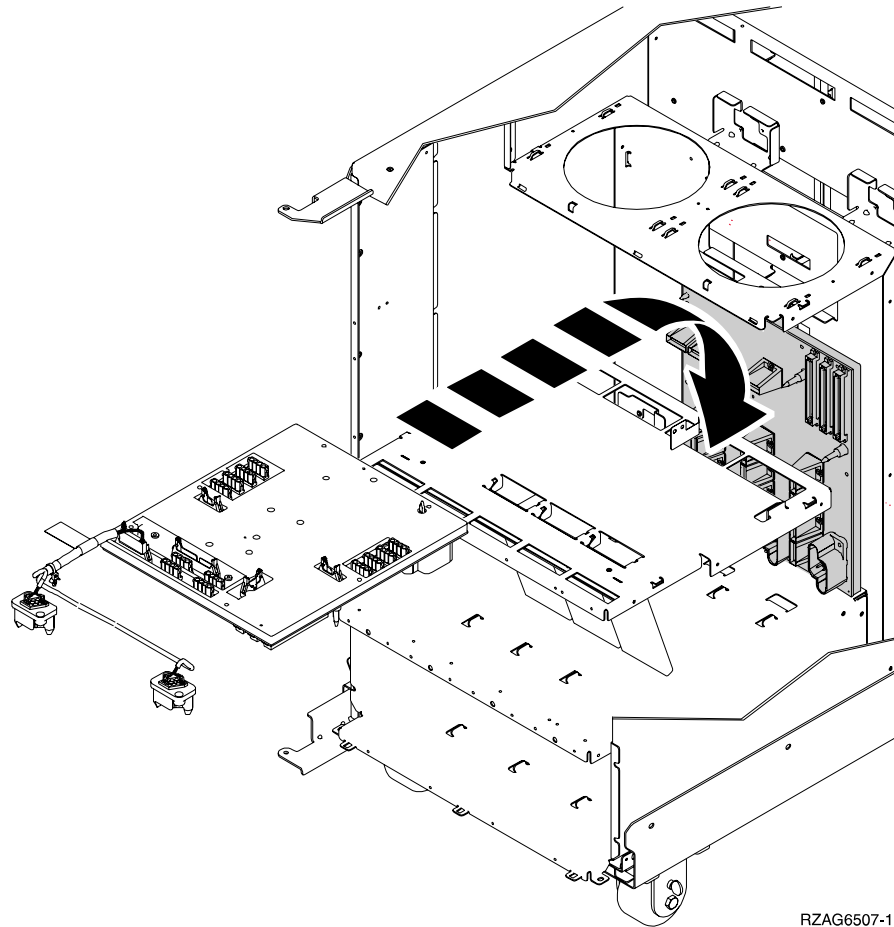
This ends the procedure.

FC 5065 or FC 5066

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord from the expansion tower.
3. Remove the covers (see “Covers” on page 638).
4. You **must** remove both disk unit backplanes DB1 and DB2. Perform “FC 5065 or FC 5066 Backplanes – DB1 and DB2” on page 600 for each backplane. After you have removed **both** disk unit backplanes DB1 and DB2 return here and continue with this procedure.
5. From the rear of the expansion tower remove the following:
 - a. The EMC access plate that is located directly above the PCI card enclosure. Press the surfaces of the two latching mechanisms together and tilt the top of the cover away from the frame to remove it.
 - b. The cables from the disk unit controller cards that are located inside the PCI card enclosure.

Attention: All cards are sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).
 - c. The screws that hold the PCI card enclosure in the frame.
 - d. Pull the PCI card enclosure partially out of the frame while lifting the cables clear of the enclosure.
 - e. Press the release mechanism that is located along the top right side of the enclosure and carefully slide the enclosure towards you. Make sure that the cables are clear of the enclosure.
 - f. The battery charger. (See “Battery Charger” on page 614.)
 - g. The power supplies. (See “FC 5065 or FC 5066” on page 663.)
 - h. The blank filler plate(s).
6. From the front of the tower, reach through the frame and remove the cables from the backside of the power distribution backplane and note their locations.
7. From the rear of the tower, remove the mounting screws that hold the power distribution backplane to the frame.

8. Pull the power distribution backplane slightly towards you and lift it up to remove it from the frame.



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9. Install the power distribution backplane by reversing the removal procedure. After exchanging an item, go to “Verifying the Repair” on page 866.

This ends the procedure.

Power Supply

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687
- “Parts Assemblies” on page 761

FC 5033, FC 5034, and FC 5035 — 480 Watt (P01)

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord from the expansion tower.
3. Remove the covers (see “Covers” on page 638).
4. Remove the left side EMC access plate.

Note: When installing this EMC shield, ensure that slotted screws are used to secure the shield to the frame.

5. Remove the AMDs (see “FC 5033, FC 5034, and FC 5035” on page 595).

6. Remove the screws that hold the AMD mounting bracket.
7. Remove all cables from the power supply.
8. Remove the screws that hold the power supply.
9. Disconnect the cables from the power supply.
10. Remove the power supply.

This ends the procedure.

FC 5033, FC 5034, and FC 5035 — 650 Watt (P03 and P04)

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord from the expansion tower.
3. Remove the covers (see “Covers” on page 638).
4. Disconnect the UPS power jumper cables from the rear of the expansion tower.
5. Remove the pedestal EMC access plate.
6. Remove the screws that hold the power supply.
7. Remove the power supply by pulling it straight out of the pedestal frame.

This ends the procedure.

FC 5033, FC 5034, and FC 5035 — 845 Watt (P01 and P02)

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord from the expansion tower.
3. Remove the covers (see “Covers” on page 638).
4. Disconnect the UPS power jumper cables from the rear of the expansion tower.
5. Remove the pedestal EMC access plate.
6. Remove the screws that hold the power supply.
7. Remove the power supply by pulling it straight out of the pedestal frame.

This ends the procedure.

FC 5065 or FC 5066

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord from the expansion tower.
3. Remove the covers (see “Covers” on page 638).
4. Disconnect the power jumper cord from the unit that you are replacing. (See “FC 5065, FC 5066 – Expansion Tower” on page 705.)
5. Remove the bottom screw (if installed).
6. Rotate the handle from right to left to release the power supply from the frame.

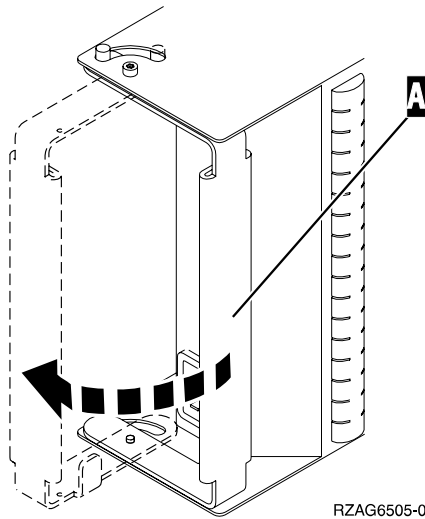
DANGER

Up to 240 V ac is present at the power module connectors when the main power cord is connected to a power source. (RSFTD010)

Remove the power supply from the frame.

Note: Do not slam the power supply in when installing it into the system. Insert it until the power supply engages the frame, then rotate the

handle from left to right.



7. Install the power supply by reversing the removal procedure. After exchanging an item, go to “Verifying the Repair” on page 866.

This ends the procedure.

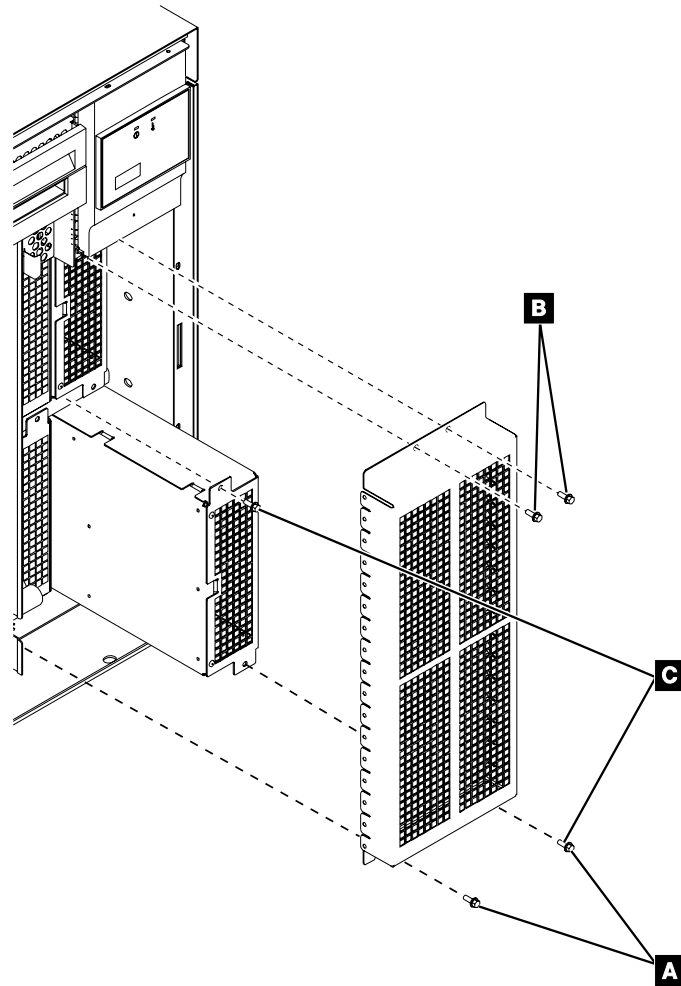
FC 5077

The new bulk will automatically power on when it is installed.

1. Power off the expansion unit, see “Powering On and Powering Off the System or Expansion Tower” on page 868.
2. Remove the front cover, see “Covers” on page 638.
3. Remove the Bulk Power EMC access plate.
4. Remove the DC power bulk.

This ends the procedure.

FC 507x/508x



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1. Power off the system (see "Powering On and Powering Off the System or Expansion Tower" on page 868).
2. Disconnect the power cord.
3. Remove the front cover (see "Covers" on page 638).
4. Loosen the screws **A**.
5. Remove the screws **B**.
6. Pull out and lift to remove the screen.
7. **DANGER**

Up to 240 V ac is present at the power module connectors when the main power cord is connected to a power source. (RSFTD010)

Remove the screws **C** to remove the power supply from the frame.

8. Install the power supply by reversing the removal procedure. Note the proper orientation of the power supply notch as shown.

After exchanging an item, go to "Verifying the Repair" on page 866.

This ends the procedure.

Removable Media — Dedicated and Concurrent

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687
- “Parts Assemblies” on page 761

FC 5033, FC 5034, and FC 5035

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687
- “Parts Assemblies” on page 761

1. Remove the front cover (see “Covers” on page 638).
2. Are you removing a unit by using device concurrent maintenance?

Note: Device concurrent maintenance is only supported on a FC 5034 and FC 5035.

Yes No

↓

- a. Power off the expansion tower. (see “Powering On and Powering Off the System or Expansion Tower” on page 868)
- b. Disconnect the power cord from the expansion tower.
- c. If you are removing the unit from a FC 5033, first remove the left side EMC access plate. Then disconnect the cables from the rear of the removable media unit.

Note: When installing this EMC access plate, ensure that slotted screws are used to secure the shield to the frame.

- d. Pull the handle on each side of the unit out and remove the unit.

Note: If the unit does not have a handle on each side, remove the screws on each side of the unit and then remove the unit.

- e. Remove the unit from the mounting frame.
- f. Refer to “Tape and Optical Unit Address Jumpers” on page 748 for the device.

This ends the procedure.

3. Before exchanging a removable media unit, you must ensure that the unit is not in use and is varied off.
4. Use the figure to determine the location of the internal removable media unit. Record this location for later use.

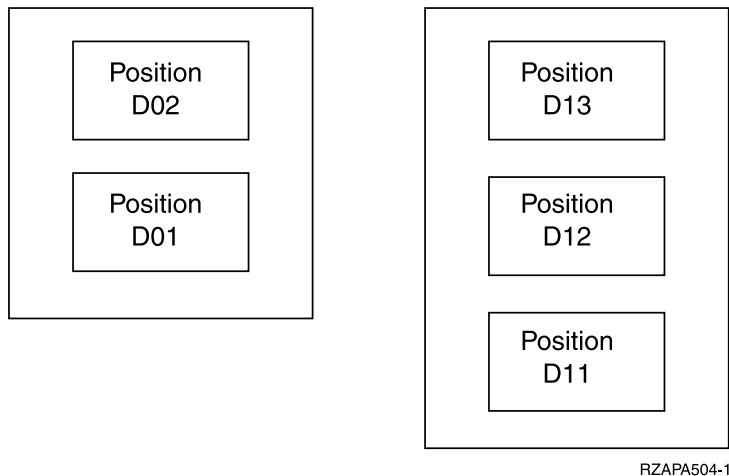


Figure 31. Internal removable media locations for the Converted CEC tower and Converted PCI and SPD Expansion Unit

5. Perform the following:
 - a. Select System Service Tools (SST). If you cannot get to SST, select DST.
Do not perform a system IPL to get to DST.
 - b. Select the *Start a Service Tool* option.
 - c. Select the *Hardware Service Manager* option.
 - d. Select *Device Concurrent Maintenance* and enter the required information in the information fields. **Do not press the Enter key at this time.**
 - e. Read the remaining steps of this procedure and ensure that you understand the procedure before continuing.
 - f. Press the Enter key on the console. After the delay time, the light at the top right of the device will begin flashing. You now have 9 seconds to pull out firmly on the handles and pull the unit partially out of the frame.
Attention: If you remove the device when the light is **not** flashing, data may be lost, the unit may be damaged, or the backplane may be damaged.

Note: The light at the top right of the device will go off and remain off as soon as the device is no longer making contact with the backplane.
 - g. Remove the unit from the holder. **This ends the removal procedure. Continue with the next step of this procedure to install the new unit.**
6.
 - a. Perform the following to **install** a new unit:
 - 1) Install the new unit into the holder.
 - 2) Select *Device Concurrent Maintenance* and enter the required information in the information fields. **Do not press the Enter key at this time.**
 - 3) Read the remaining steps of this procedure and ensure that you understand the procedure before continuing.
 - 4) Slide the unit partially into the mounting frame. **Ensure that the device does not contact the backplane at this time.**
 - 5) Press the Enter key on the console. After the delay time, the light at the top right of the device will begin flashing. You now have 9 seconds to push in firmly on the handles and push the unit completely into the frame.

Attention: If you install the device when the light is **not** flashing, data may be lost, the unit may be damaged, or the backplane may be damaged.

Note: The light at the top right of the device will go off and remain off for a few seconds when the device contacts the backplane. Then it should go on and remain on.

Did the light on the device go on and remain on?

No **Yes**

↓ **This ends the install procedure.**

- 6) Attempt the device concurrent maintenance procedure again without physically moving the unit.

Did the light above the device go on and remain on?

No **Yes**

↓ **This ends the install procedure.**

- 7) There is a power problem. Either:

- The new unit is defective
- The backplane was damaged during the device concurrent maintenance procedure.
- There is a new problem with the power subsystem.

This ends the procedure.

FC 5065 and FC 5066

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687
- “Parts Assemblies” on page 761

Note: Determine if the system has logical partitions. Go to “Determining if the System Has Logical Partitions” on page 875, before continuing with this procedure.

1. Are you removing a unit by using device concurrent maintenance?

Yes **No**

↓

- a. Power off the expansion tower. (see “Powering On and Powering Off the System or Expansion Tower” on page 868)
- b. Disconnect the power cord from the expansion tower.
- c. Open the front cover. (See “FC 5065 and FC 5066” on page 639.)
- d. Pull on the handles which are located on each side of the unit and remove the unit.
- e. Install the new device by reversing the removal procedure. After exchanging an item, go to “Verifying the Repair” on page 866.

This ends the procedure.

2. Before exchanging a removable media unit, you must ensure that the unit is not in use and is varied off.

3. Use the figure to determine the location of the internal removable media unit. Record this location for later use.

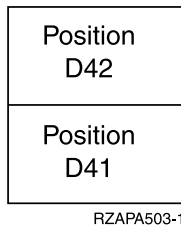


Figure 32. Internal removable media locations

4. Perform the following:
 - a. Select System Service Tools (SST). If you cannot get to SST, select DST.
Do not perform a system IPL to get to DST.
 - b. Select the *Start a Service Tool* option.
 - c. Select the *Hardware Service Manager* option.
 - d. Select *Device Concurrent Maintenance* and enter the required information in the information fields. **Do not press the Enter key at this time.**
 - e. Read the remaining steps of this procedure and ensure that you understand the procedure before continuing.
 - f. Press the Enter key on the console. After the delay time, the light at the top right of the device will begin flashing. You now have 9 seconds to pull out firmly on the handles and pull the unit partially out of the tower.
Attention: If you remove the device when the light is **not** flashing, data may be lost, the unit may be damaged, or the backplane may be damaged.

Note: The light at the top right of the device will go off and remain off as soon as the device is no longer making contact with the backplane.
 - g. Remove the unit from the tower.
This ends the removal procedure. Continue with the next step of this procedure to install the new unit.
5. Perform the following to **install** a new unit:
 - a. Select *Device Concurrent Maintenance* and enter the required information in the information fields. **Do not press the Enter key at this time.**
 - b. Read the remaining steps of this procedure and ensure that you understand the procedure before continuing.
 - c. Slide the unit partially into the tower. **Ensure that the device does not contact the backplane at this time.**
 - d. Press the Enter key on the console. After the delay time, the light at the top right of the device will begin flashing. You now have 9 seconds to push in firmly on the handles and push the unit completely into the frame.
Attention: If you install the device when the light is **not** flashing, data may be lost, the unit may be damaged, or the backplane may be damaged.

Note: The light at the top right of the device will go off and remain off for a few seconds when the device contacts the backplane. Then it should go on and remain on.

Did the light on the device go on and remain on?

No Yes

↓ After exchanging an item, go to "Verifying the Repair" on page 866.
This ends the install procedure.

- e. Attempt the device concurrent maintenance procedure again without physically moving the unit.

Did the light above the device go on and remain on?

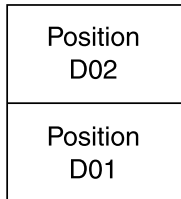
No Yes

↓ After exchanging an item, go to "Verifying the Repair" on page 866.
This ends the install procedure.

- f. There is a power problem. Either:
 - The new unit is defective.
 - The backplane was damaged during the device concurrent maintenance procedure.
 - There is a new problem with the power subsystem.

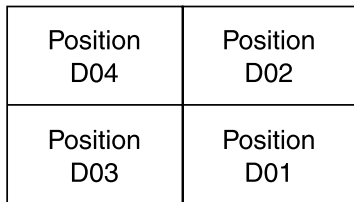
This ends the procedure.

FC 5077



RZAPA500-1

Figure 33. Internal removable media locations for the Converted CEC Unit



RZAPA501-1

Figure 34. Internal removable media locations for the Converted Base I/O Tower

FC 507x/508x Removable Media (Concurrent)

Attention: If removing the cover while powered on, errors may occur due to Electromagnetic Interference.

Attention: The removable media unit is sensitive to electrostatic discharge (see "Appendix C. Working with Electrostatic Discharge-Sensitive Parts" on page 899).

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

Note: If the system has logical partitions, perform this procedure from the logical partition that owns the removable media. (See “Determining if the System Has Logical Partitions” on page 875.)

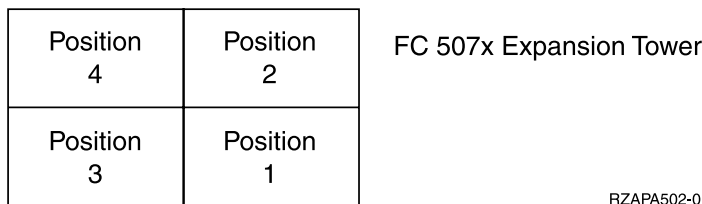
1. Is the unit you are working with attached to a type 2624 Magnetic Storage I/O Processor?

No **Yes**

↓ Concurrent repair is not given support. Go to “FC 507x/508x Removable Media (Dedicated)” on page 672.

This ends the procedure.

2. Before exchanging a removable media unit, you must verify that the unit is not in use.
3. Use the figure to determine the location of the internal removable media unit. Record this location for later use.



RZAPA502-0

Figure 35. Internal removable media locations

4. Do not power off the system.
5. Remove the front cover (see “Covers” on page 638).
6. If you are removing a removable media unit, do the following:
 - a. Select System Service Tools (SST).
If you cannot get to SST, select DST (see “Accessing Dedicated Service Tools” in the *AS/400 Service Functions*).

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

 - b. On the Service Tools display, select the *Start a service tool* option (see the *AS/400 Service Functions*).
 - c. Select the *Hardware Service Manager* option on the Start a Service Tool display.
 - d. Select *Concurrent Maintenance* from the Hardware Service Manager display and follow the instructions to remove a device. 1xxx 02xx will appear in the Function/Data display on the control panel for about 8 seconds. Three 8-second periods will occur about 15 seconds apart.
 - e. **Attention:** If you remove the removable media unit when 1xxx 02xx is not shown in the Function/Data display on the control panel, data may be lost and the unit may be damaged.
When 1xxx 02xx appears in the Function/Data display on the control panel, remove the removable media unit by pulling the handle down or up and out.
7. If you are installing a removable media unit, do the following:
 - a. Select System Service Tools (SST).
If you cannot get to SST, select DST (see “Accessing Dedicated Service Tools” in the *AS/400 Service Functions*).

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

- b. On the Service Tools display, select the *Start a service tool* option (see the *AS/400 Service Functions*).
 - c. Select the *Hardware Service Manager* option on the Start a Service Tool display.
 - d. Select *Concurrent Maintenance* from the Hardware Service Manager display and follow the instructions to install a device. 1xxx 01xx will be shown in the Function/Data display on the control panel for about 8 seconds. Three 8-second periods will occur about 15 seconds apart.
 - e. **Attention:** If you install the removable media unit when 1xxx 01xx is not shown in the Function/Data display on the control panel, data may be lost. When 1xxx 01xx is shown in the Function/Data display on the control panel, install and latch the removable media unit.
 - f. Install the front cover (see "Covers" on page 638).
8. Return to the procedure that sent you here.
After exchanging an item, go to "Verifying the Repair" on page 866.
This ends the procedure.

FC 507x/508x Removable Media (Dedicated)

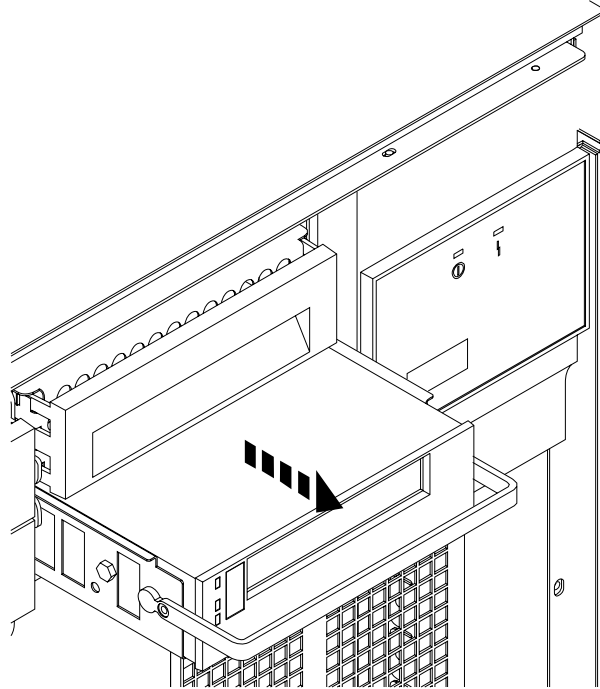
Note: It may be possible to exchange the tape or optical unit without powering off the system (see "FC 507x/508x Removable Media (Concurrent)" on page 670).

1. Is the unit you are working with attached to a type 2624 Magnetic Storage I/O Processor?

Yes	No
↓	Concurrent repair is possible. Go to "FC 507x/508x Removable Media (Concurrent)" on page 670.

This ends the procedure.

2. Power off the system unit or the expansion tower where the removable media is located. (See "Powering On and Powering Off the System or Expansion Tower" on page 868.)
3. Disconnect the power cord.
4. Remove the front cover (see "Covers" on page 638).
5. Remove the unit by pulling the handle down or up and then out.
6. Install the removable media unit by reversing the removal procedure.
After exchanging an item, go to "Verifying the Repair" on page 866.
This ends the procedure.



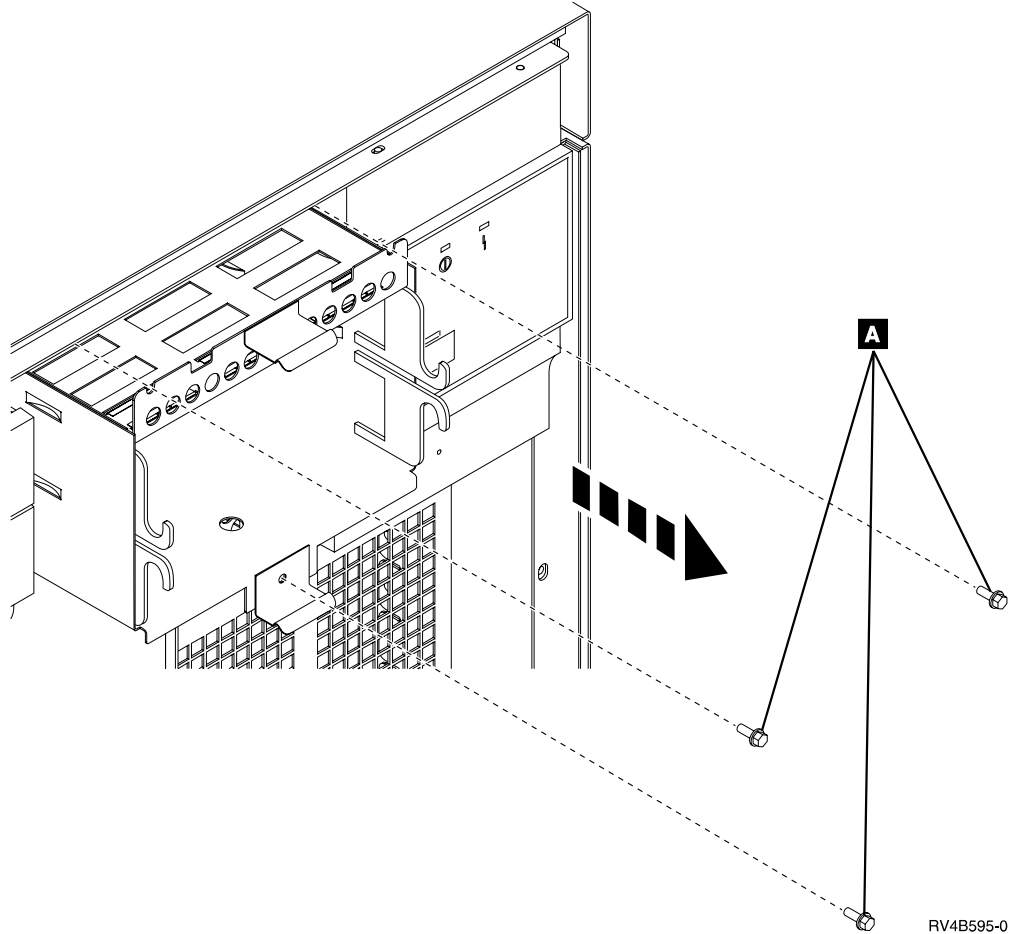
RV4B594-0

FC 507x/508x Removable Media Enclosure

1. Power off the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord.
3. Remove the front cover (see “Covers” on page 638).
4. Remove the removable media devices (see “FC 507x/508x Removable Media (Dedicated)” on page 672).
5. Remove the screws **A** to remove the removable media enclosures.

Note: If there is a bracket on the rear of the removable media enclosure, remove it and install the bracket on the removable media enclosure you are installing.

6. Install the removable media enclosure by reversing the removal procedure. After exchanging an item, go to “Verifying the Repair” on page 866.
This ends the procedure.



Tape Cartridge – Manual Removal (FC 507x/508x)

6383, 6585, 6586 Tape Cartridge

Attention: This procedure is very delicate and may damage or destroy the tape cartridge. Use this procedure only when you have tried the other options for removing the tape cartridge.

The following procedure describes how to remove a tape cartridge manually from a 6383, 6585, or 6586 tape unit. You may need this procedure if a power failure or tape unit failure prevent the tape cartridge from ejecting.

The procedure for removing a tape cartridge varies for the following two conditions:

- Standby position - with the bridge moved away from the cartridge.
- Locked position - with the bridge engaged to the cartridge.

To determine which position the tape unit is in, open the tape unit door and check the location of the bridge.

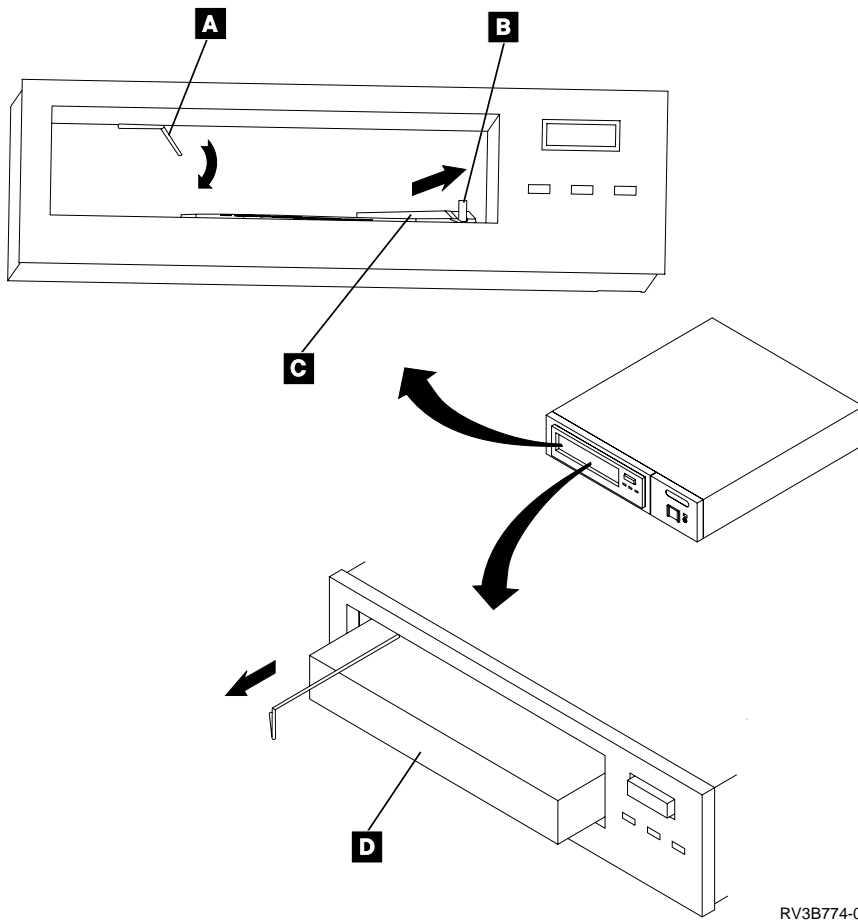
Locked Position:

1. Power off the tape unit.
2. Open the tape unit door.

3. Locate the metal axle **B** inside the tape unit. Look towards the lower right corner.
4. Insert a pointed object (like a pen or screwdriver) into the tape unit and push the axle inward.
5. Push the bridge **C** to the right.
The tape unit is now in standby position. Continue with "Standby Position".

Standby Position:

1. Power off the tape unit.
2. Open the tape unit door.
3. Locate the hook shaped metal rod **A** inside the tape unit in the upper left corner.
4. Insert a pointed object (like a pen or screwdriver) into the tape unit and push the metal rod downward.
5. Pull the metal rod forward until the cartridge ejects.
The cartridge **D** is pushed out the tape unit door and can be removed.



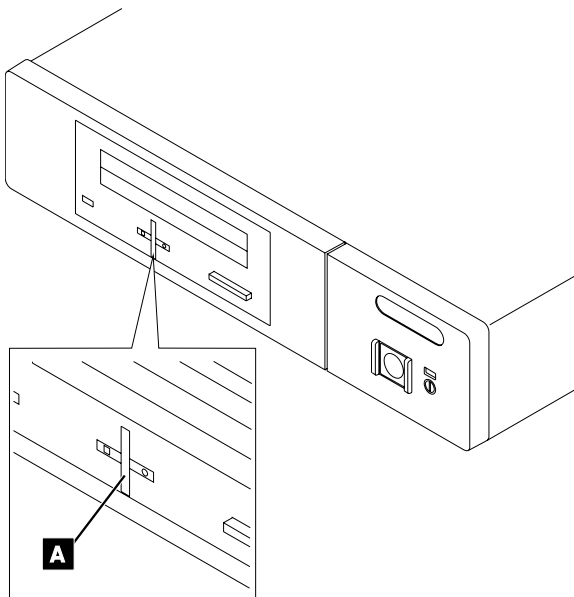
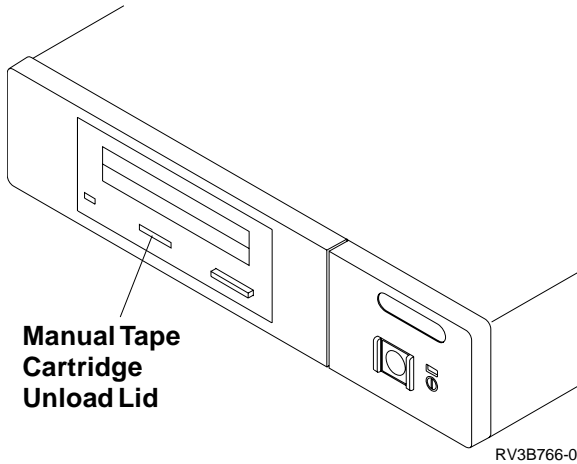
RV3B774-0

1/4 inch Tape Cartridge (Type 6335)

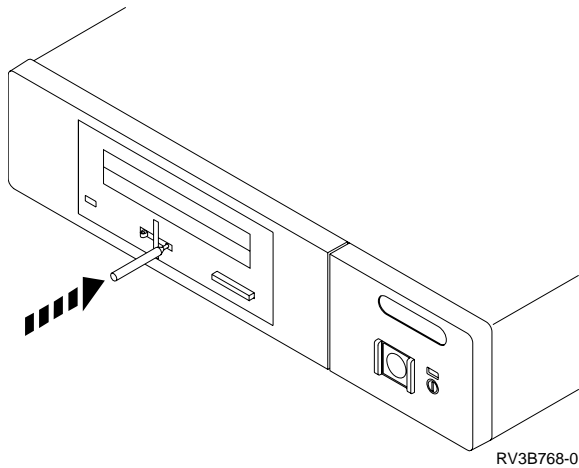
Attention: This procedure is very delicate and may damage or destroy the tape cartridge. Use this procedure only when you have attempted the other options for removing the tape cartridge.

The following procedure describes how to remove a tape cartridge manually from an internal 1/4 inch tape unit. This procedure may be required if a defective tape cartridge or tape unit has caused the cartridge ejection function to fail. The procedure may also be needed if the data on the tape cartridge is either critical or sensitive and the customer can not afford its loss.

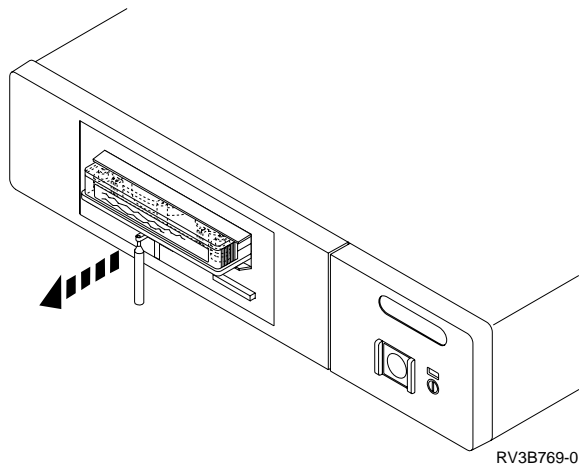
1. Power off the tape unit.
2. Carefully lift and turn the manual tape cartridge unload lid **A**.



3. Insert a solid metal rod (like a bristol wrench) into the manual tape cartridge unload hole and push in until it stops and the arm appears.



4. Pull the arm out until it stops. Insert the solid metal rod into the hole of the arm and pull out until the tape cartridge comes out.



5. Remove the tape cartridge.
6. Push the arm back in until it stops, turn the manual tape cartridge lid back to the starting position and push it back in place.

Type 6390 8-mm Tape Cartridge (6390) (FC 507x/508x)

Attention: This procedure is very delicate and may damage or destroy the tape cartridge. Use this procedure only when you have attempted the other options for removing the tape cartridge.

The following procedure describes how to remove a tape cartridge manually from an internal 8-mm tape unit. This procedure should be used if a defective tape cartridge or tape unit has caused a failure of the tape ejection function. The procedure should also be used if the data on the tape cartridge is critical or sensitive and the customer can not afford its loss.

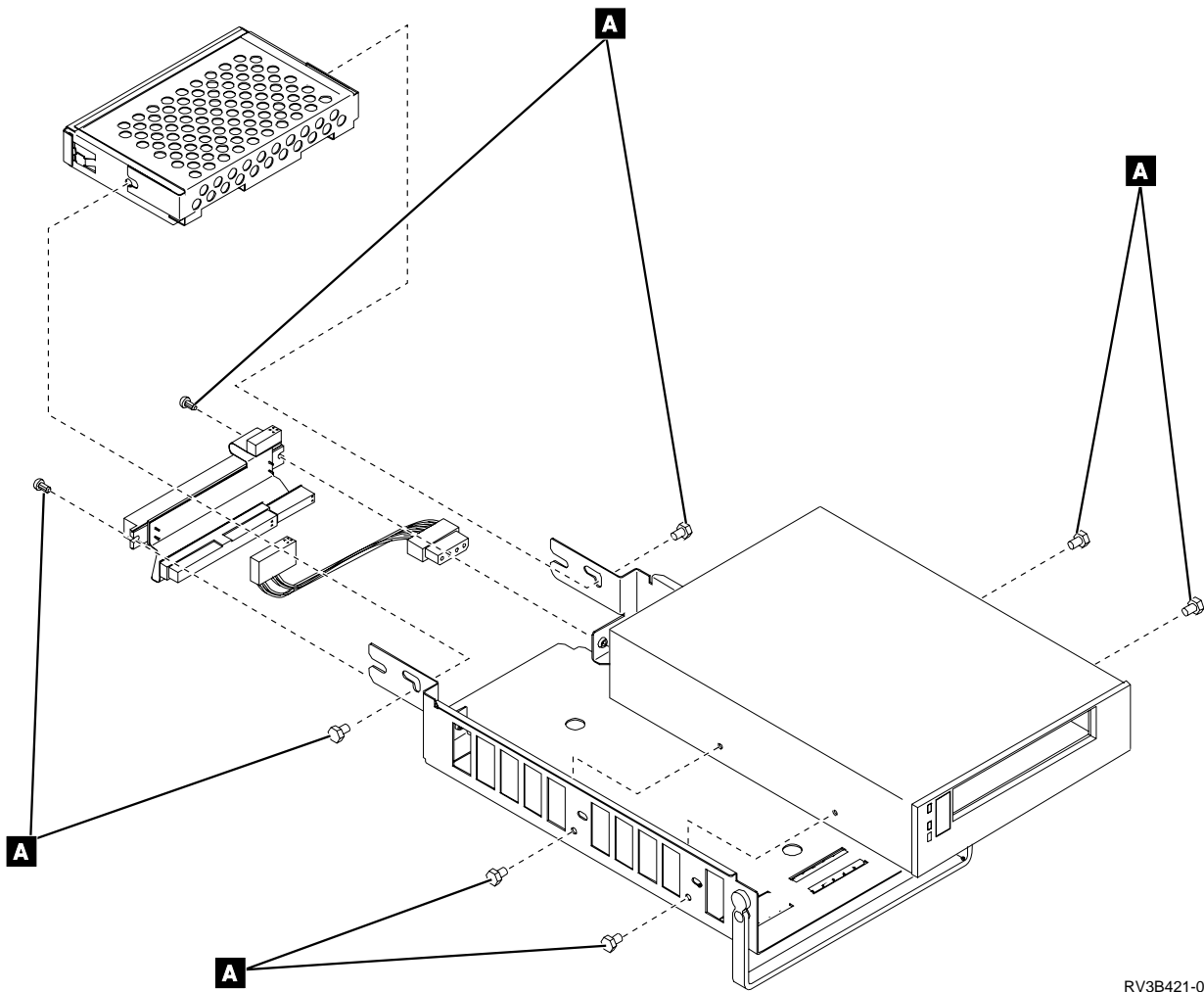
1. Is the 8-mm tape drive in a tray as shown below?

Yes No

↓ Go to step 4 of this procedure.

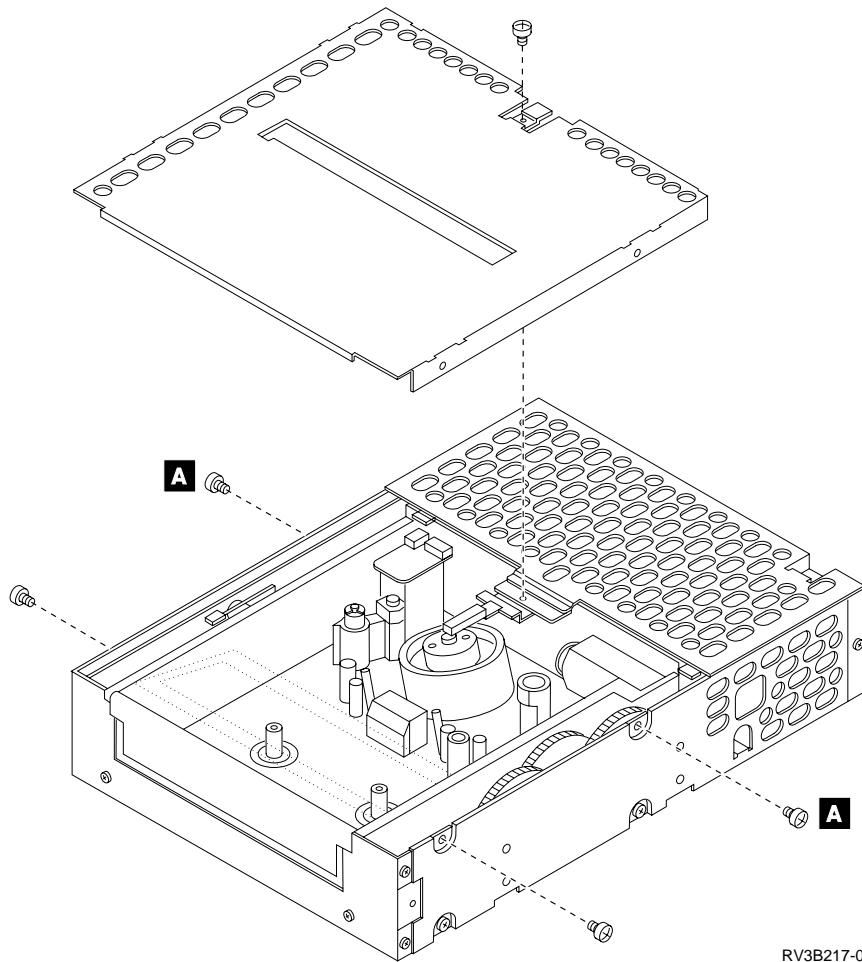
2. Remove the tape unit from the system (see "Removable Media — Dedicated and Concurrent" on page 666).

3. Remove the screws **A** to remove the tape drive from the tape tray.



RV3B421-0

4. Remove the screws from the top cover of the drive assembly. Screws **A** may not be present.



RV3B217-0

5. Inspect the tape and tape cartridge. There are two positions for the tape:
 - If a tape is unloaded correctly, it is tight across the opening of the tape cartridge as shown. It should not touch any tape guides in the drive assembly.
 - Loaded (touching) on the tape guides.

Is the tape unloaded correctly?

No **Yes**

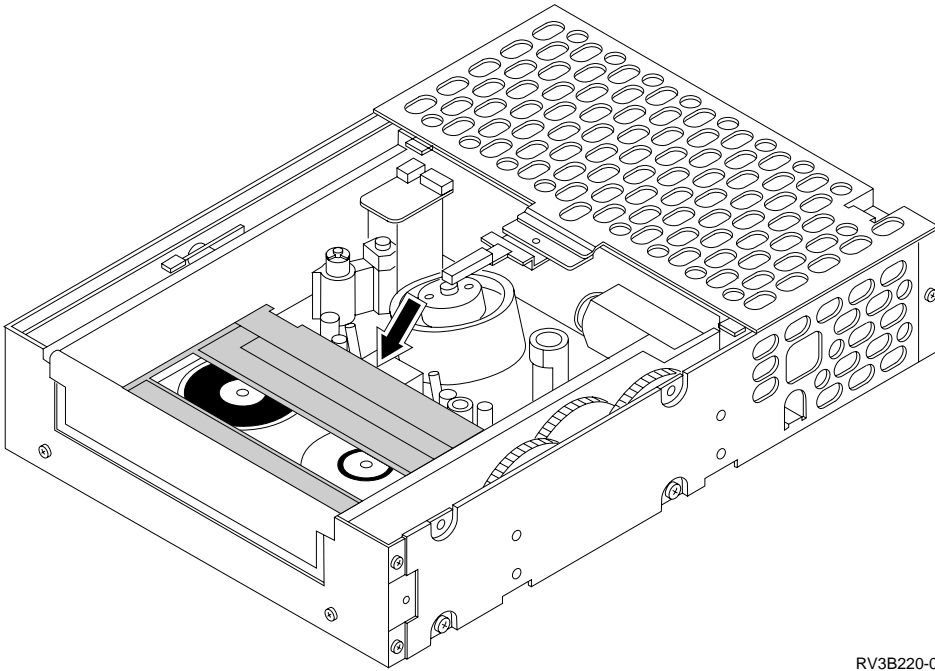
↓ Go to step 9 of this procedure.

6. The drive assembly may need assistance to unload the tape. Two options are available:
 - Cutting the tape
To perform this option, continue with step 7 of this procedure.
 - Using manual actions to unload the tape from the tape guides
To perform this option, go to step 8 of this procedure.

Note: The instructions listed in step 7 of this procedure may damage the tape and can result in data loss from that tape cartridge. The customer should be made aware of this possibility before these procedures are attempted.

7. **Attention:** The following step will destroy the data and the tape cartridge.

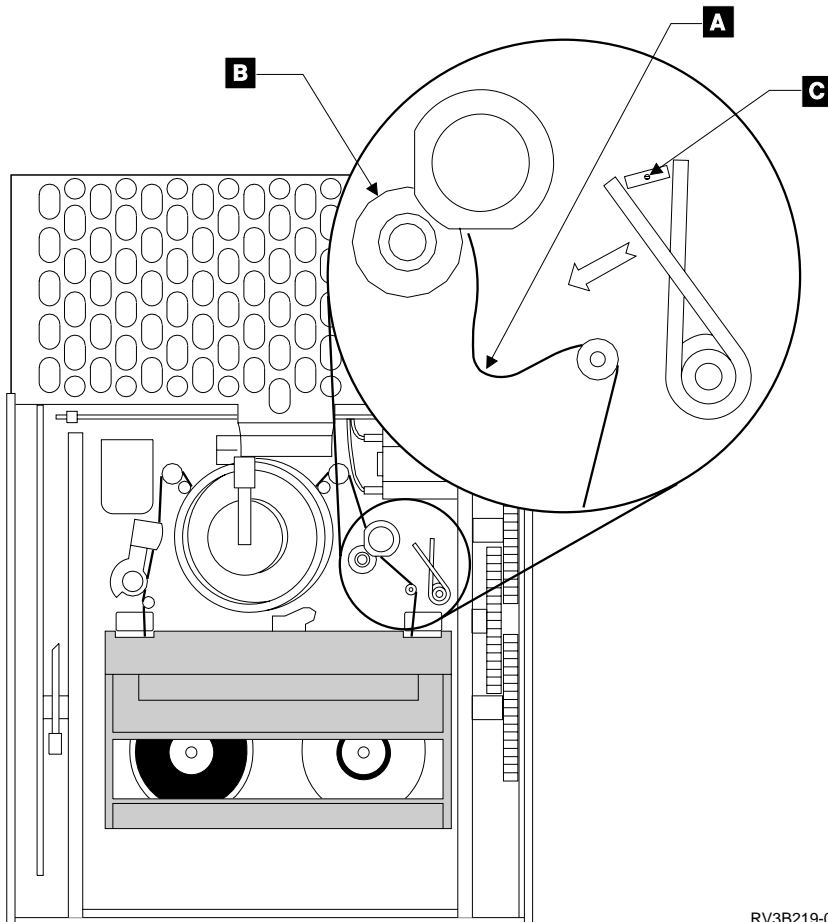
Cut the tape at a convenient location. Go to step 9 of this procedure to remove the tape cartridge from the drive assembly.



RV3B220-0

8. Perform the following:
 - a. Loosen the tape as shown **A**. Make sure not to damage or crease the tape. If the pinch roller **B** is engaged, push the pinch roller spring bracket as shown **C**. This releases the pinch roller and provides a gap from which the tape can be removed.

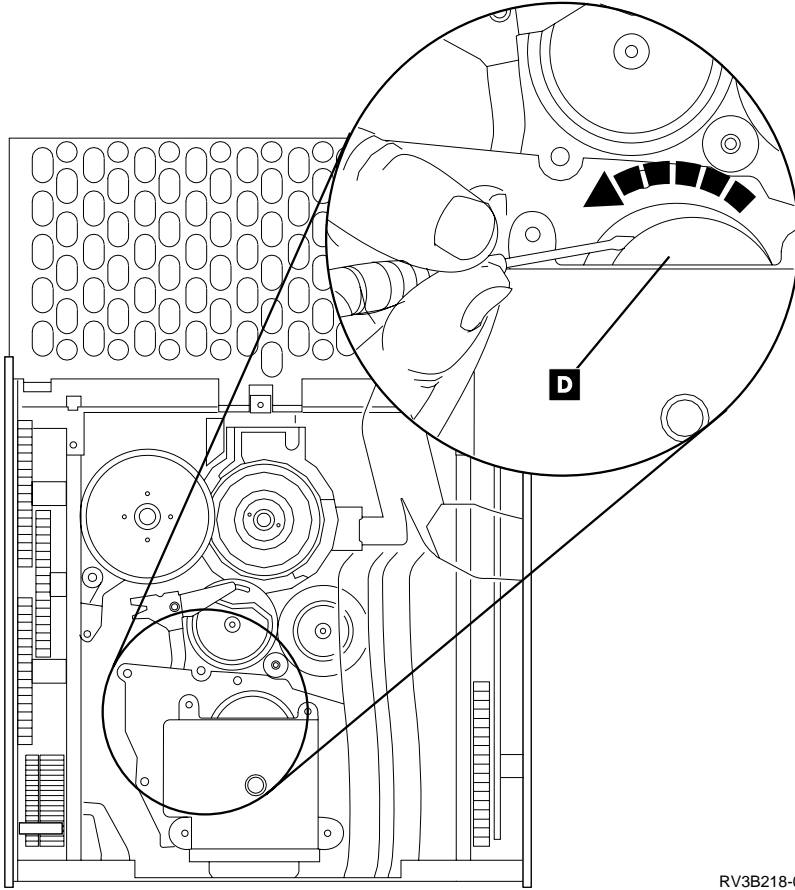
Note: Use a smooth, clean, rounded tool to loosen and lift the tape off the tape guides.



RV3B219-0

- b. Turn the drive assembly over. Remove the five screws from the bottom cover of the drive assembly. These screws are similar to the screws on the top cover.
- c. Wind the tape into the tape cartridge by following these steps:
 - 1) Using a small screwdriver, push and hold the reel motor gear **D** to the right as far as possible.
 - 2) Rotate the reel motor gear counter-clockwise while also maintaining pressure by holding the gear to the right.
 - 3) Continue to rotate the gear until all of the tape is wound into the tape cartridge and the tape is tight across the opening.

Note: Make sure that the tape does not catch on the guide pins.
- d. Continue with the next step of this procedure.

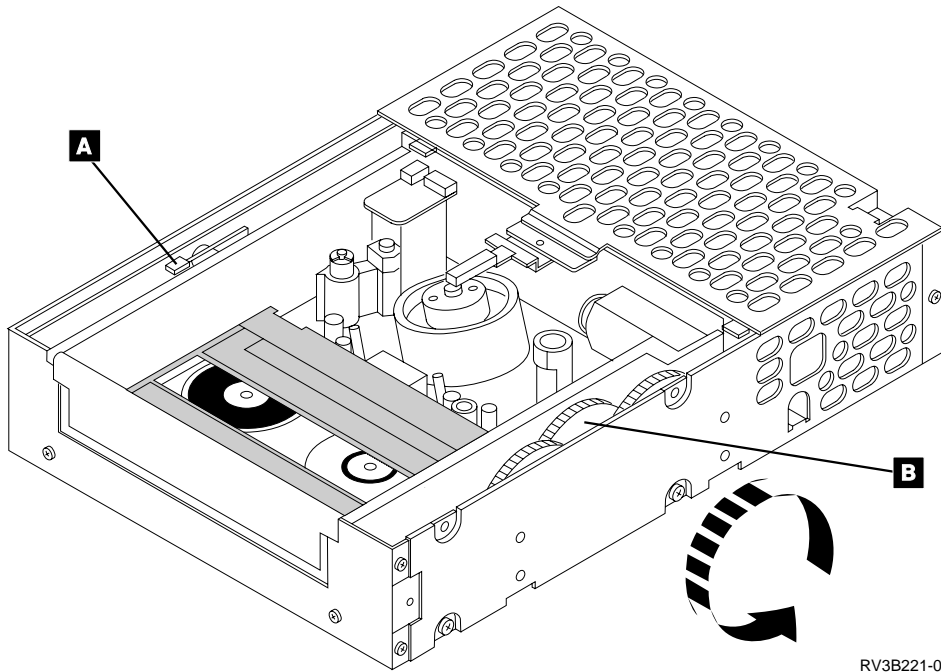


RV3B218-0

9. Find the lock release tab **A** and the cassette loading gear **B**.
10. Using your index finger, gently press down the lock release tab until it clicks.
11. Using the thumb of your other hand, roll the cassette loading gear toward the front of the drive assembly until the tape cartridge is ejected.

Note: Removed cartridges should not be reused.

This ends the procedure.



RV3B221-0

SPCN Panel Card (SPNLCARD)

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687
- “Parts Assemblies” on page 761

FC 5033, FC 5034, and FC 5035

Attention: The SPCN panel card is sensitive to electrostatic discharge (see “Appendix C. Working with Electrostatic Discharge-Sensitive Parts” on page 899).

CAUTION:

This assembly has a circuit card that contains lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the assembly as instructed by local regulations. (RSFTC235)

1. Power off the expansion tower (see “Powering On and Powering Off the System or Expansion Tower” on page 868).
2. Disconnect the power cord from the expansion tower.
3. Remove the front cover (see “Covers” on page 638).
4. Remove the screws that hold the control panel assembly.
5. Disconnect the 3 cables that connect the control panel to the SPCN panel card.

Note: Label the cables to ensure correct installation.

6. Remove the control panel.
7. Disconnect the cables connected to the SPCN panel card.
8. Remove the SPCN panel card.
9. Reverse the previous steps to install the new SPCN panel card.
10. After the installation is complete, IPL the system in **Manual Mode**.

11. The system date and time will need to be set after this procedure is completed. See *AS/400 Service Functions*.

This ends the procedure.

Uninterruptible Power Supply

Reference the expansion tower you are working on in the following sections of this book:

- “Expansion Tower Locations and Addresses” on page 687.
- “Parts Assemblies” on page 761.

Important UPS Information

Before continuing the repair action, read and understand the following information. It is important that the instructions to verify the repair are followed.

After completing a repair action, you must run a battery test from the Hardware Service Test display. The test is required to verify the repair and also to reset the 90-day battery test timer.

If the battery is not charged, the UPS may reject the test and the HST display will show a status code of 2C. Any other code indicates that the test was successful. Depending on the state of the battery charge, it may take up to 24 hours for the UPS to accept the test.

If the SRC that initiated the repair action was 1xxx 2403, 1xxx 2404, 1xxx 2405, or 1xxx 2406, this SRC will display when the system is powered on after the repair action is complete. A battery test will reset this SRC indication. If the SRC is not reset after the battery test, the repair action was not successful and the UPS was not the failing item.

If the SRC that initiated the repair action was **not** 1xxx 2403, 1xxx 2404, 1xxx 2405, or 1xxx 2406, and the repair action was successful, the system will power on and no SRC will display. However, the battery test must still be run to reset the 90-day timer. If the repair action was not successful, either the original SRC or a new SRC will display.

If a problem was detected during the battery test, the results may be misleading because the SRC may not return until a new test is required.

Once the battery test is successful, the repair action is complete.

FC 5033, FC 5034, and FC 5035

Before continuing with this procedure, ensure that you have read and understand the information in “Important UPS Information”.

1. Are you only doing concurrent maintenance on a UPS battery? (Service while powered on)

No Yes

↓

Go to step 5 on page 685 of this procedure.

2. Power off the system. (see “Powering On and Powering Off the System or Expansion Tower” on page 868)
3. Disconnect the power cord from the expansion tower.

Attention: AC power must be removed to prevent the batteries from charging during the removal procedure.

4. **Attention:** Wait 2 minutes and 30 seconds before continuing this procedure. This ensures that the system is not running on the UPS batteries.

5. Remove the covers (see "Covers" on page 638).

6. Remove the pedestal EMC access plate.

Are you only exchanging the transformer?

No Yes

↓

Go to step 10 of this procedure.

7. Remove the battery pack retaining bar.

CAUTION:

Be careful when removing or installing this part or unit. This part or unit is heavy, but has a weight smaller than 18 kilograms (39.7 pounds). (RSFTC201)

8. Disconnect the battery cable connectors from the connectors on the UPS power supply.

CAUTION:

The battery is a lead-acid battery. To avoid possible explosion, do not burn. Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations.

In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (RSFTC225)

9. Slide the battery pack out of the pedestal.

Are you only exchanging the battery pack?

No Yes

↓

This ends the procedure. Reverse this procedure to install or reinstall the battery.

10. Remove the front pedestal EMC access plate.

11. Remove the screws that hold the transformer assembly.

DANGER

Up to 240 V ac is present at the power module connectors when the main power cord is connected to a power source. (RSFTD010)

12. Slide the transformer assembly out the front of the pedestal.

Are you only exchanging the transformer?

No Yes

↓

This ends the procedure.

13. Disconnect the UPS power jumper cables from the rear of the system.

14. Remove the screws that hold the UPS power supply.

15. Remove the screws that hold the power supply.

16. Slide the UPS power supply out of the pedestal.

Chapter 5. Locations, Addresses, and Part Listings

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FC 5065 or 5066 Expansion Tower	723	5066 expansion tower	786
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Expansion Tower Locations and Addresses

Start Here for Locations Information

This procedure describes how to find the correct diagram to use in this section.

1. Do you know the Frame ID?

No **Yes**

↓ The Frame ID is the hexadecimal representation of the decimal number

that is displayed on the panel of the unit or rack. Find the unit or rack that displays this number. Then, find the unit or rack diagram that matches this hardware. Tower diagrams are in this book.

For rack diagrams, see *FC 504x Problem Analysis and Repair and Parts*.

2. Use the following steps in "Hardware Service Manager" in SST/DST to locate which tower the failing item is in, using the bus number given in the direct select address.
 - a. Go to SST. If SST is not available, go to DST.
 - b. Select "Start a service tool".
 - c. Select "Hardware service manager".
 - d. Select "Logical hardware resources".
 - e. Select "System bus resources".
 - f. Change the "System bus or buses to work with" field to the decimal equivalent of the Hex bus address" (this is the first four characters of the Direct Select Address). Press enter.
 - g. Select the *Associated packaging resources* (option 8) for any IOP that is displayed.

```

Logical Hardware Resources on System Bus

System bus(es) to work with . . . . . 6 *ALL, 1- 7
Subset by . . . . . *ALL *ALL, *STG, *WS, *CMN

Type options, press Enter.
2=Change detail 4=Remove 5=Display detail 6=I/O Debug
8=Associated packaging resource(s) 9=Resources associated with IO P

Resource
Opt Description Type-Model Status Name
- System Bus - Operational BUS02
8 Storage IOP 6512-001 Operational SI04
- Storage IOP 6512-001 Operational SI05

F3=Exit F5=Refresh F6=Print F9=Failed resources
F10=Non-reporting resources F11=Display serial/part numbers F12=Cancel
  
```

Figure 36. Example Display Only

3. The number that is displayed in the "Frame ID" column is the hexadecimal representation of the decimal number displayed on the panel of the unit or rack. Find the unit or rack that displays this number. Then, find the unit or rack diagram that matches this hardware. Tower diagrams are in this book. For rack diagrams, see *FC 504x Problem Analysis and Repair and Parts*.

```

Packaging Resources Associated with a Logical Resource

Logical resource      Type-Model  Resource Name
Storage IOP          6512-001   SI04

Type options, press Enter.

2=Change detail      4=Remove      5=Display detail
8=Associated logical resource(s)  9=Hardware contained within package

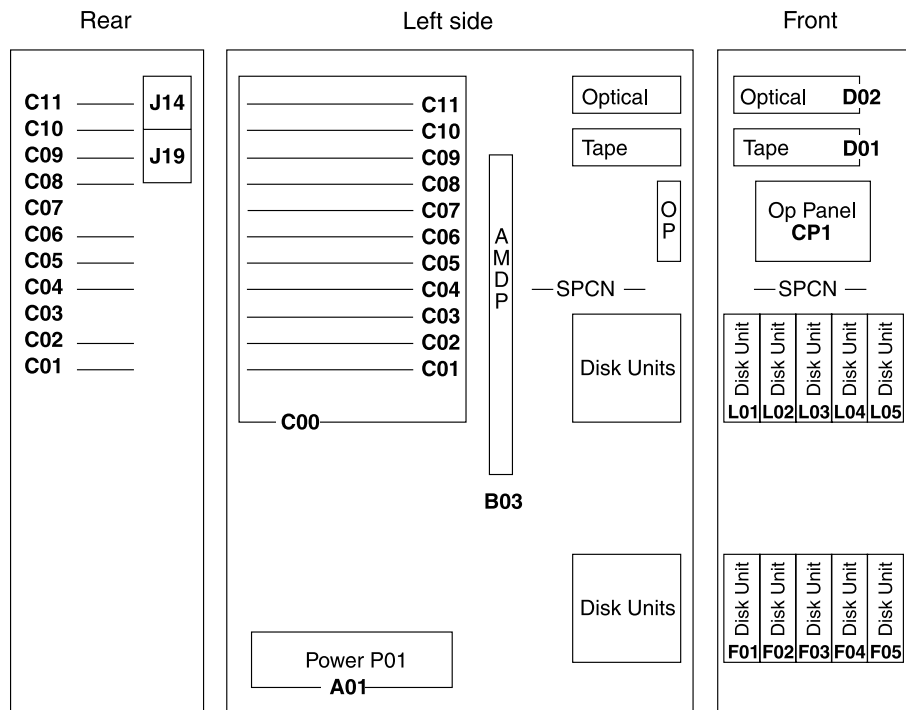
Opt Description      Type-Model  Frame ID  Resource Name
_ Storage IOP        6512-001   4         C18

F3=Exit      F5=Refresh      F6=Print
F10=Non-reporting hardware  F11=Unresolved locations  F12=Cancel

```

Figure 37. Example Display Only

FC 5033 – Migrated Tower Base Unit



AMD = Air Moving Device

RZAQ3500-1

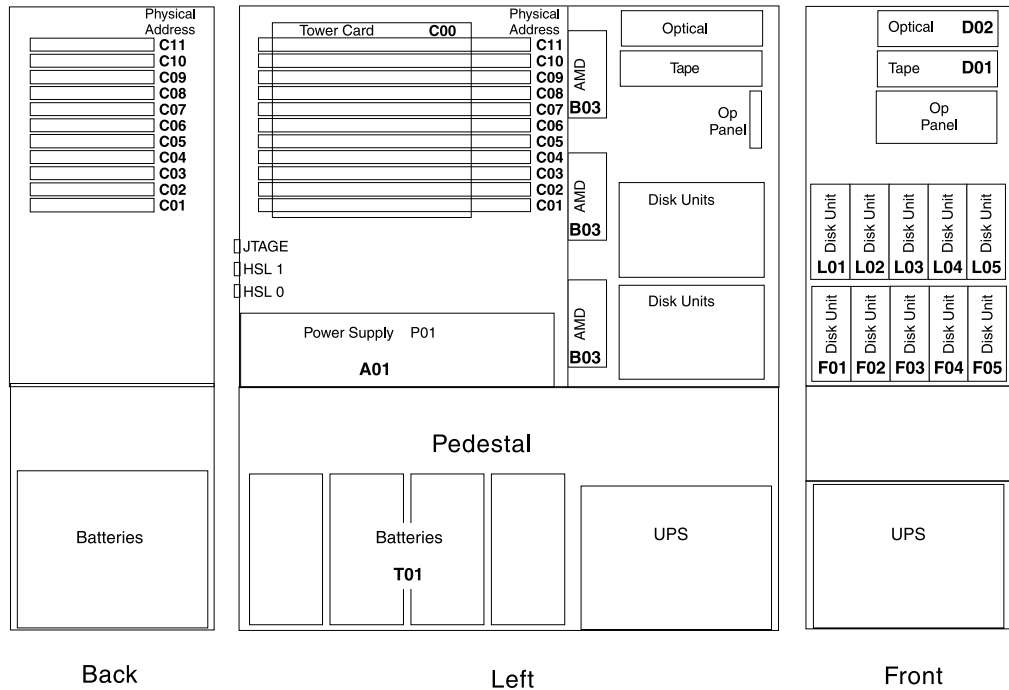
Figure 38. FC 5033 Migrated Tower Base Unit

Notes:

1. To determine the locations for high speed or low speed IOAs, see “High and Low Speed PCI IOAs” on page 729.
2. Location C09 is used for Electronic Customer Support.

3. The backplane (embedded CFIOP) controls locations C04 through C11.
4. The Combined Function IOP in location C03 controls locations C01 through C05.
5. If the Integrated Netfinity Server for AS/400 (2850) is installed in location C07, it controls locations C04 and C05.
6. J14 is the Uninterruptible Power Supply connector.
7. J19 is a manufacturing interface.

FC 5034 – Migrated Tower Base Unit



RZAQ2509-4

Figure 39. FC 5034 Migrated Tower Base Unit

Notes:

1. For the PCI expansion unit, see "FC 5034, FC 5035 – PCI Expansion Unit" on page 695. For the SPD expansion unit, see "FC 5034, FC 5035 – SPD Expansion Unit" on page 700.
2. To determine the locations for high speed or low speed IOAs, see "High and Low Speed PCI IOAs" on page 729.
3. Location C09 is used for Electronic Customer Support.
4. The backplane (embedded CFIOP) controls locations C04 through C11.
5. The Combined Function IOP in location C03 controls locations C01 through C05.
6. If the Integrated Netfinity Server for AS/400 (2850) is installed in location C07, it controls locations C04 and C05.
7. J14 is the Uninterruptible Power Supply connector.
8. J19 is a manufacturing interface.

FC 5035 – Migrated Tower Base Unit

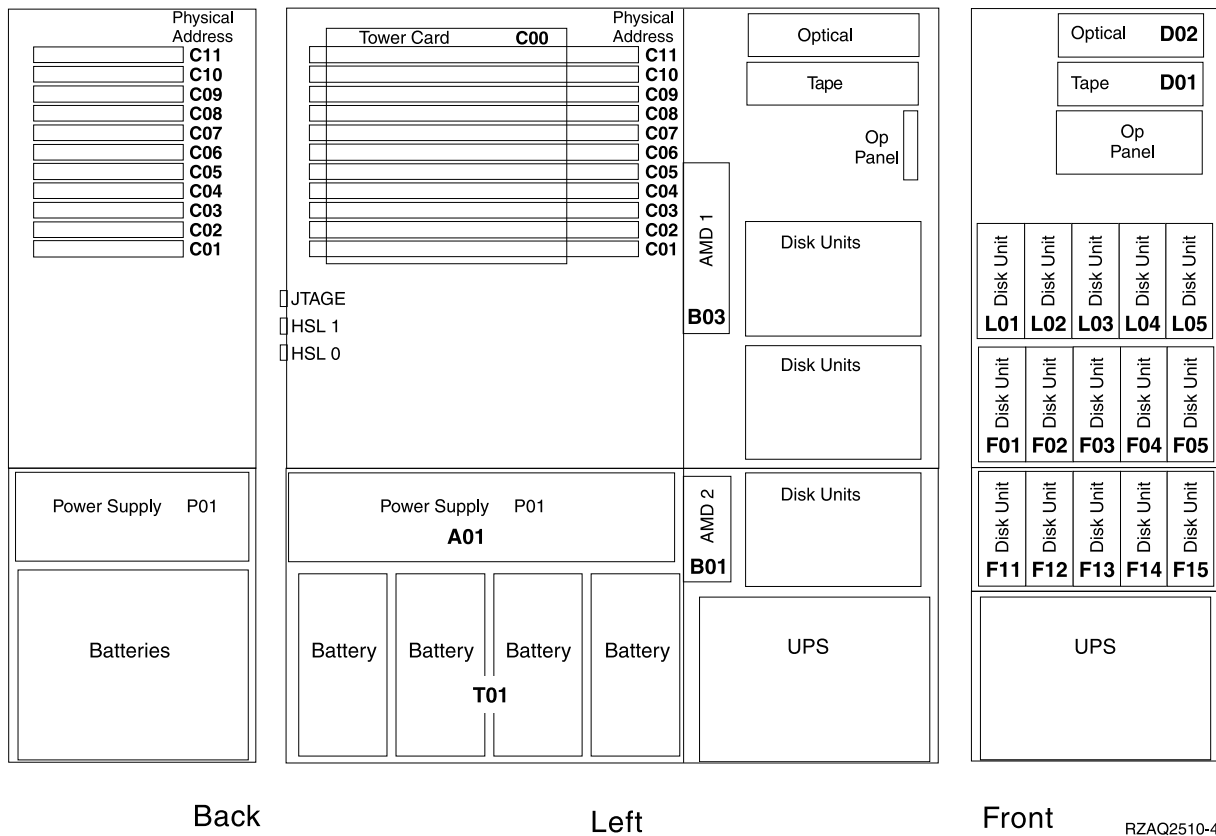


Figure 40. FC 5035 Migrated Tower Base Unit

Notes:

1. For the PCI expansion unit, see “FC 5034, FC 5035 – PCI Expansion Unit” on page 695. For the SPD expansion unit, see “FC 5034, FC 5035 – SPD Expansion Unit” on page 700.
2. To determine the locations for high speed or low speed IOAs, see “High and Low Speed PCI IOAs” on page 729.
3. Location C09 is used for Electronic Customer Support.
4. The backplane (embedded CFIOP) controls locations C04 through C11.
5. The Combined Function IOP in location C03 controls locations C01 through C05.
6. If the Integrated Netfinity Server for AS/400 (2850) is installed in location C07, it controls locations C04 and C05.
7. J11 is the Remote Power On/EPO connector.
8. J14 is the Uninterruptible Power Supply connector.
9. J15 is the SPCN connector.
10. J19 is a manufacturing interface.

Table 28. FRU Positions and Failing Items, FC 503x Base Unit

FRU Positions and Failing Items, FC 503x Base Unit							
Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
					(See Type, Model and Part Number list for additional Types and Part Numbers.)		
C00	Tower Card	I/O Processor (embedded) - OR - HSL (SI) I/O Adapter Card - OR - Card Enclosure or Backplane	0004-01-00		282C		See "FC 5033, FC 5034, and FC 5035 Tower Card" on page 597.
C01	High Speed IOA	ATM	0004-02-00	ECFF FFFF	See "Type, Model, and Part Number List" on page 750.		See "Cards – in FC 503x PCI expansion" on page 615.
		ATM port		EC00 FFFF			
		High Speed Ethernet Adapter		ECFF FFFF			
		LAN port		EC00 FFFF			
C02	Storage IOA	External SCSI Controller	0004-02-00	0FFF FFFF	See "Type, Model, and Part Number List" on page 750.		
C03	CFIOP (Combined Function IOP)	I/O Processor	0004-02-00		See "Type, Model, and Part Number List" on page 750.		
C04	IOA	INS LAN	0004-01-00	E400 FFFF	See "Type, Model, and Part Number List" on page 750.		
		Twinax (if no card in C07)	0004-02-00	E0xx yyzz	2722 2746	21H5394 21H5497	
		WAN / LAN (if no card in C07)		E0FF FFFF	See "Type, Model, and Part Number List" on page 750.		
C05	IOA	INS LAN	0004-01-00	E401 FFFF	See "Type, Model, and Part Number List" on page 750.		
		Twinax (if no card in C07)	0004-02-00	E1xx yyzz	2722 2746	21H5394 21H5497	
		WAN / LAN (if no card in C07)		E1FF FFFF	See "Type, Model, and Part Number List" on page 750.		

Table 28. FRU Positions and Failing Items, FC 503x Base Unit (continued)

FRU Positions and Failing Items, FC 503x Base Unit							
Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
					(See Type, Model and Part Number list for additional Types and Part Numbers.)		
C06	Bridge Note: Integrated PC Service reports VPD for the Bridge	Bridge Card (for INS and feature cards)	0004-01-00	E5FF FFFF	285A Mod 001 Mod 002 Mod 003	90H8952 90H8994 90H9212	See "Cards – in FC 503x PCI expansion" on page 615.
C07	Integrated Netfinity Server	Integrated Netfinity Server	0004-01-00	E4FF FFFF	2850 Mod 001 Mod 002 Mod 011 Mod 012	61H0115 61H0116 61H0127 23L4210	
		Integrated Netfinity Server for AS/400 virtual port		E40F FFFF			
C08	IOA	WAN/LAN	0004-01-00	E0FF FFFF	See "Type, Model, and Part Number List" on page 750.		
		Twinax		E0xx yyzz	2722 2746	21H5394 21H5497	
		Workstation		E8xx yyzz	2720	90H9192	
C09	IOA	WAN/LAN	0004-01-00	E1FF FFFF	See "Type, Model, and Part Number List" on page 750.		
		Client Access Console		E9FF FFFF			
		Client Access Console Workstation		E900 00FF			
		Twinax		E1xx yyzz	2722 2746	21H5394 21H5497	
		Workstation		E9xx yyzz	2720	90H9192	
C10	IOA	WAN/LAN	0004-01-00	E2FF FFFF	See "Type, Model, and Part Number List" on page 750.		
		Client Access Console		EAFF FFFF			
		Client Access Console Workstation		EA00 00FF			
		Twinax		E2xx yyzz	2722 2746	21H5394 21H5497	
		Workstation		EAXx yyzz	2720	90H9192	
C11	Storage IOA	I/O Adapter	0004-01-00	0FFF FFFF	See "Type, Model, and Part Number List" on page 750.		
L01	Disk Unit	Disk Unit	0004-01-00	0FFF FFFF	See "Disk Unit Type, Model, and Part Number List" on page 756.		See "Disk Unit — Dedicated and Concurrent" on page 643.
L02	Disk Unit	Disk Unit	0004-01-00	0002 00FF			
L03	Disk Unit	Disk Unit	0004-01-00	0003 00FF			
L04	Disk Unit	Disk Unit	0004-01-00	0004 00FF			
L05	Disk Unit	Disk Unit	0004-01-00	0005 00FF			
D01	Tape	Tape	0004-01-00	0007 00FF	See "Type, Model, and Part Number List" on page 750.		See "Removable Media — Dedicated and Concurrent" on page 666.

Table 28. FRU Positions and Failing Items, FC 503x Base Unit (continued)

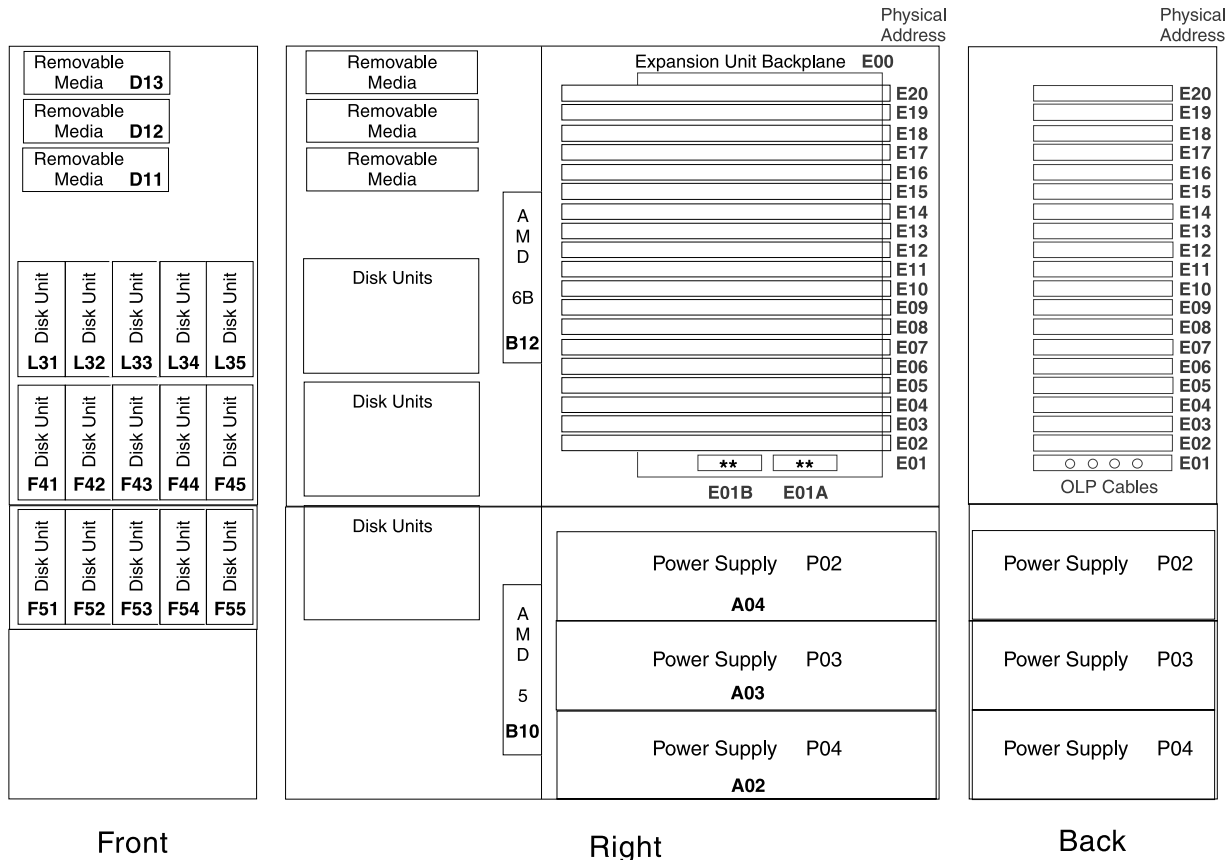
FRU Positions and Failing Items, FC 503x Base Unit							
Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
					(See Type, Model and Part Number list for additional Types and Part Numbers.)		
D02	Optical	Optical	0004-01-00	0006 00FF	See "Type, Model, and Part Number List" on page 750.		See "Removable Media — Dedicated and Concurrent" on page 666.
F01	Disk Unit	Disk Unit	0004-01-00	0101 00FF	See "Disk Unit Type, Model, and Part Number List" on page 756.		See "Disk Unit — Dedicated and Concurrent" on page 643.
F02	Disk Unit	Disk Unit	0004-01-00	0102 00FF			
F03	Disk Unit	Disk Unit	0004-01-00	0103 00FF			
F04	Disk Unit	Disk Unit	0004-01-00	0104 00FF			
F05	Disk Unit	Disk Unit	0004-01-00	0105 00FF			
F11	Disk Unit	Disk Unit	0004-01-00	0201 00FF			
F12	Disk Unit	Disk Unit	0004-01-00	0202 00FF			
F13	Disk Unit	Disk Unit	0004-01-00	0203 00FF			
F14	Disk Unit	Disk Unit	0004-01-00	0204 00FF			
F15	Disk Unit	Disk Unit	0004-01-00	0205 00FF			
A01 FC 5033	Power Supply P01	Power Supply 480 Watt				21H9364		See "FC 5033, FC 5034, and FC 5035 — 480 Watt (P01)" on page 662.
A01 FC 5034	Power Supply P01	Power Supply 480 Watt				21H9364	
A01 FC 5035	Power Supply P01	Power Supply 950 Watt				44H7779	See "FC 5033, FC 5034, and FC 5035 — 845 Watt (P01 and P02)" on page 663.
B03 FC 5033, FC 5034	AMDP	Air Moving Device				44H7756	See "FC 5033, FC 5034, and FC 5035" on page 595.
AMD1 FC 5035	AMD1	Air Moving Device				44H8336	
AMD2 FC 5035	AMD2	Air Moving Device				44H7889	
T01	Battery or UPS	Battery - OR - UPS					See "Uninterruptible Power Supply" on page 684.
CP1	Control Panel	Control Panel					See "FC 5033, FC 5034, FC 5035" on page 636.
External Battery Backup					5150		

Notes:

1. The 2720 workstation/communications adapter reports VPD twice; once for twinax and once for communications. Communications and twinax have different type numbers.

- For workstation unit addresses --xx yyzz; xx is the port address (00-07), yy is the workstation address, and zz is the shared session.
- Positions C04 and C05 are dual purpose. If the Integrated Netfinity Server for AS/400 (2850) is installed in position 7, then positions C04 and C05 are connected to the Integrated Netfinity Server for AS/400 (2850).

FC 5034, FC 5035 – PCI Expansion Unit



** - Optical Bus Driver Card

RZAQ2512-4

Figure 41. FC 503x with PCI Expansion Unit

Table 29. FRU Positions and Failing Items, FC 503x PCI Expansion Unit

FRU Positions and Failing Items, FC 503x PCI Expansion Unit							
Position	FRU Name	Possible Failing Item(s)	DSA (BBBBCCbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
					(See Type, Model and Part Number list for additional Types and Part Numbers.)		
E00	Expansion Unit Backplane	Card Enclosure or Backplane - OR - Local Bus Adapter	0006-xx-00, 0007-xx-00, 0008-xx-00, 0009-xx-00		2826	45H1235	See "FC 5033, FC 5034, and FC 5035 Expansion PCI Backplane" on page 599.

Table 29. FRU Positions and Failing Items, FC 503x PCI Expansion Unit (continued)

FRU Positions and Failing Items, FC 503x PCI Expansion Unit							
Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
					(See Type, Model and Part Number list for additional Types and Part Numbers.)		
E01A	SPD Optical Bus Driver	Optical Link Card	0006-xx-00 and 0007-xx-00		2686	87G5316	See "Cards – in FC 503x SPD expansion" on page 616.
		- OR - SPD Optical Bus driver			2688	87G5560	
E01B	SPD Optical Bus Driver	Optical Link Card	0008-xx-00 and 0009-xx-00		2686	87G5316	
		- OR - SPD Optical Bus driver			2688	87G5560	
E02	IOA	Twinax	0005-03-00	E0xx yzzz	2722 2746	21H5394 21H5497	See "Cards – in FC 503x PCI expansion" on page 615.
		WAN/LAN		E0FF FFFF	See "Type, Model, and Part Number List" on page 750.		
E03	IOA	Twinax	0005-03-00	E1xx yzzz	2722 2746	21H5394 21H5497	See "Type, Model, and Part Number List" on page 750.
		WAN/LAN		E1FF FFFF	See "Type, Model, and Part Number List" on page 750.		

Table 29. FRU Positions and Failing Items, FC 503x PCI Expansion Unit (continued)

FRU Positions and Failing Items, FC 503x PCI Expansion Unit							
Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
					(See Type, Model and Part Number list for additional Types and Part Numbers.)		
E04	IOA	Twinax	0005-03-00	E2xx yyzz	2722	21H5394	See "Cards – in FC 503x PCI expansion" on page 615.
		WAN/LAN		E2FF FFFF	2746	21H5497	
E05	CFIOP	I/O Processor	0005-03-00		2809	21H5312	
					2824	91H4023	
E06	High Speed IOA	ATM	0005-03-00	E7FF FFFF	See "Type, Model, and Part Number List" on page 750.		
		ATM port		E700 FFFF	2838	21H5460	
		High Speed Ethernet Adapter		E7FF FFFF			
		LAN port		E700 FFFF			
		External SCSI Controller		0FFF FFFF	See "Type, Model, and Part Number List" on page 750.		
E07	IOA	Twinax	0005-02-00	E0xx yyzz	2722	21H5394	
		WAN/LAN		E0FF FFFF	2746	21H5497	
E08	IOA	Twinax	0005-02-00	E1xx yyzz	2722	21H5394	
		WAN/LAN		E1FF FFFF	2746	21H5497	
E09	IOA	Twinax	0005-02-00	E2xx yyzz	2722	21H5394	
		WAN/LAN		E2FF FFFF	2746	21H5497	
E10	CFIOP (Combined Function IOP)	I/O Processor	0005-02-00		2809	21H5312	
					2824	91H4023	
E11	High Speed IOA	ATM	0005-02-00	E7FF FFFF	See "Type, Model, and Part Number List" on page 750.		
		ATM port		E700 FFFF	2838	21H5460	
		High Speed Ethernet Adapter		E7FF FFFF			
		LAN port		E700 FFFF			
		External SCSI Controller		0FFF FFFF	See "Type, Model, and Part Number List" on page 750.		

Table 29. FRU Positions and Failing Items, FC 503x PCI Expansion Unit (continued)

FRU Positions and Failing Items, FC 503x PCI Expansion Unit							
Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
					(See Type, Model and Part Number list for additional Types and Part Numbers.)		
E12	IOA	Twinax	0005-01-00	E0xx yyzz	2722	21H5394	See "Cards – in FC 503x PCI expansion" on page 615
		WAN/LAN		E0FF FFFF	2746	21H5497	
E13	IOA	Twinax	0005-01-00	E1xx yyzz	2722	21H5394	
		WAN/LAN			See "Type, Model, and Part Number List" on page 750.		
E14	IOA	Twinax	0005-01-00	E2xx yyzz	2722	21H5394	
		WAN/LAN			See "Type, Model, and Part Number List" on page 750.		
E15	CFIOP (Combined Function IOP)	I/O Processor	0005-01-00		2809	21H5312	
					2824	91H4023	
E16	Storage IOA	I/O Adapter	0005-01-00	0FFF FFFF	See "Type, Model, and Part Number List" on page 750.		
E17	LAN IOA	INS LAN	0005-01-00	E400 FFFF	See "Type, Model, and Part Number List" on page 750.		
E18	LAN IOA	INS LAN	0005-01-00	E401 FFFF	See "Type, Model, and Part Number List" on page 750.		
E19	Integrated Netfinity Server for AS/400	Integrated Netfinity Server for AS/400	0005-01-00	E4FF FFFF	2850		
				E40F FFFF	Mod 001	61H0115	
				Mod 002	61H0116		
				Mod 011	61H0127		
		Integrated Netfinity Server for AS/400 virtual port			Mod 012	23L4210	
E20	Bridge Note: Integrated Netfinity Server for AS/400 reports VPD for the Bridge	Bridge Card (for INS and feature cards)	0005-01-00	E5FF FFFF	285A		
					Mod 001	90H8952	
					Mod 002	90H8994	
					Mod 003	90H9212	

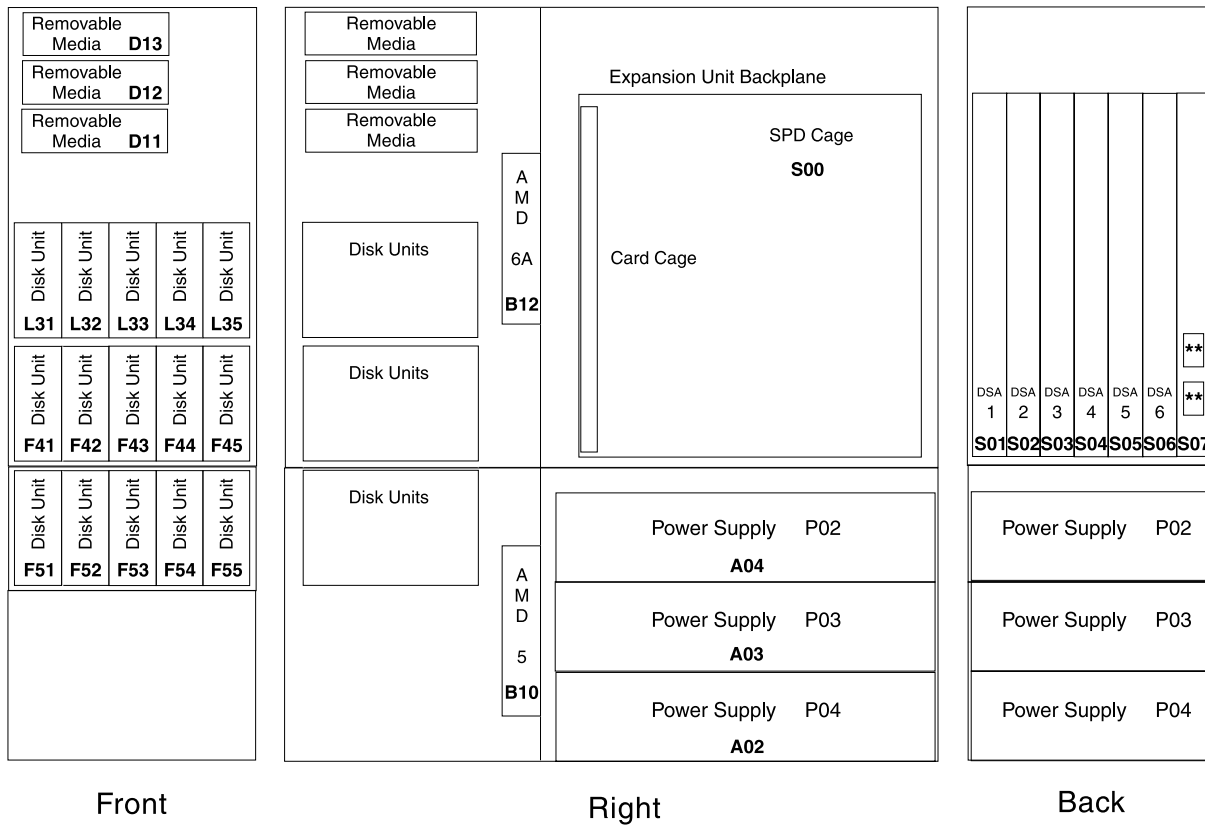
Table 29. FRU Positions and Failing Items, FC 503x PCI Expansion Unit (continued)

FRU Positions and Failing Items, FC 503x PCI Expansion Unit							
Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
					(See Type, Model and Part Number list for additional Types and Part Numbers.)		
D11	Tape	Tape	0005-01-00	0800 FFFF Note: The tape unit in this location must be a 2-byte wide SCSI tape unit (68 pin connector)	See "Type, Model, and Part Number List" on page 750.		See "Removable Media — Dedicated and Concurrent" on page 666
D12	Tape	Tape	0005-01-00	0700 FFFF	See "Type, Model, and Part Number List" on page 750.		
D13	Tape	Tape	0005-01-00	0600 FFFF	See "Type, Model, and Part Number List" on page 750.		
F31	Disk Unit	Disk Unit	0005-01-00	0001 00FF	See "Disk Unit Type, Model, and Part Number List" on page 756.		See "Disk Unit — Dedicated and Concurrent" on page 643
F32	Disk Unit	Disk Unit	0005-01-00	0002 00FF			
F33	Disk Unit	Disk Unit	0005-01-00	0003 00FF			
F34	Disk Unit	Disk Unit	0005-01-00	0004 00FF			
F35	Disk Unit	Disk Unit	0005-01-00	0005 00FF			
F41	Disk Unit	Disk Unit	0005-01-00	0101 00FF			
F42	Disk Unit	Disk Unit	0005-01-00	0102 00FF			
F43	Disk Unit	Disk Unit	0005-01-00	0103 00FF			
F44	Disk Unit	Disk Unit	0005-01-00	0104 00FF			
F45	Disk Unit	Disk Unit	0005-01-00	0105 00FF			
F51	Disk Unit	Disk Unit	0005-01-00	0201 00FF			
F52	Disk Unit	Disk Unit	0005-01-00	0202 00FF			
F53	Disk Unit	Disk Unit	0005-01-00	0203 00FF			
F54	Disk Unit	Disk Unit	0005-01-00	0204 00FF			
F55	Disk Unit	Disk Unit	0005-01-00	0205 00FF			
AMD5	AMD5	Air Moving Device				44H7904	See "FC 5033, FC 5034, and FC 5035" on page 595
AMD6B	AMD6B	Air Moving Device				44H8336	
A02	Power Supply P04	Power Supply 650 Watt			5151	44H7777	See "FC 5033, FC 5034, and FC 5035 — 650 Watt (P03 and P04)" on page 663
A03	Power Supply P03	Power Supply 650 Watt			5151	44H7777	See "FC 5033, FC 5034, and FC 5035 — 650 Watt (P03 and P04)" on page 663
A04	Power Supply P02	Power Supply 950 Watt				44H7779	See "FC 5033, FC 5034, and FC 5035 — 845 Watt (P01 and P02)" on page 663
B12	Backplane	Device Board					

Table 29. FRU Positions and Failing Items, FC 503x PCI Expansion Unit (continued)

FRU Positions and Failing Items, FC 503x PCI Expansion Unit							
Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
					(See Type, Model and Part Number list for additional Types and Part Numbers.)		
B10	SPCN Card	SPCN Card					

FC 5034, FC 5035 – SPD Expansion Unit



** - Optical Bus Driver Card

RZAQ2511-4

Figure 42. FC 503x with SPD Expansion Unit

Table 30. FRU Positions and Failing Items, FC 503x SPD Expansion Unit

FRU Positions and Failing Items, FC 503x SPD Expansion Unit							
Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
					(See Type, Model and Part Number list for additional Types and Part Numbers.)		
S00	Expansion Unit Backplane	Card Enclosure or Backplane - OR - SPD Books				44H7994	See "FC 5033, FC 5034, and FC 5035 Expansion SPD Backplane" on page 599
S01	Internal Disk Unit IOP -or- SPD Feature	I/O Processor Disk Unit CNTRL IOP	0005-01-00		See "Type, Model, and Part Number List" on page 750		See "Cards – in FC 503x SPD expansion" on page 616
S02	Internal Tape IOP -or- SPD Feature	I/O Processor Internal Tape IOP	0005-02-00		See "Type, Model, and Part Number List" on page 750		
S03	SPD Feature IOP	I/O Processor	0005-03-00		See "Type, Model, and Part Number List" on page 750.		
S04	SPD Feature IOP	I/O Processor	0005-04-00		See "Type, Model, and Part Number List" on page 750.		
S05	SPD Feature IOP	I/O Processor	0005-05-00		See "Type, Model, and Part Number List" on page 750.		
S06	SPD Feature IOP	I/O Processor	0005-06-00		See "Type, Model, and Part Number List" on page 750.		
S07	Local Bus Adapter	Local Bus Adapter	SPD busses 0006, 0007, 0008 and 0009		2735	44H7791	
S07C	SPD Optical Bus Driver	Optical Link Card	0006-xx-00 and 0007-xx-00		2686 2688	87G5316 87G5560	
		SPD Optical Bus Driver Card					
S07B	SPD Optical Bus Driver	Optical Link Card	0008-xx-00 and 0009-xx-00		2686 2688	87G5316 87G5560	
		SPD Optical Bus Driver Card					
D11	Tape	Tape	0005-02-00	0800 FFFF Note: The tape unit in this location must be a 2-byte wide SCSI tape unit (68 pin connector)	See "Type, Model, and Part Number List" on page 750.		See "Removable Media — Dedicated and Concurrent" on page 666
D12	Tape	Tape	0005-02-00	0700 FFFF			
D13	Tape	Tape	0005-02-00	0600 FFFF			

Table 30. FRU Positions and Failing Items, FC 503x SPD Expansion Unit (continued)

FRU Positions and Failing Items, FC 503x SPD Expansion Unit							
Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
					(See Type, Model and Part Number list for additional Types and Part Numbers.)		
F31	Disk Unit	Disk Unit	0005-01-00	Unit Addresses differ according to the type of Internal Disk Unit IOP installed in position S01. See Table 31 on page 703	See "Disk Unit Type, Model, and Part Number List" on page 756.	See "Disk Unit — Dedicated and Concurrent" on page 643	
F32	Disk Unit	Disk Unit	0005-01-00				
F33	Disk Unit	Disk Unit	0005-01-00				
F34	Disk Unit	Disk Unit	0005-01-00				
F35	Disk Unit	Disk Unit	0005-01-00				
F41	Disk Unit	Disk Unit	0005-01-00				
F42	Disk Unit	Disk Unit	0005-01-00				
F43	Disk Unit	Disk Unit	0005-01-00				
F44	Disk Unit	Disk Unit	0005-01-00				
F45	Disk Unit	Disk Unit	0005-01-00				
F51	Disk Unit	Disk Unit	0005-01-00				
F52	Disk Unit	Disk Unit	0005-01-00				
F53	Disk Unit	Disk Unit	0005-01-00				
F54	Disk Unit	Disk Unit	0005-01-00				
F55	Disk Unit	Disk Unit	0005-01-00				
AMD5	AMD5	Air Moving Device			44H7904	See "FC 5033, FC 5034, and FC 5035" on page 595	
AMD6A	AMD6A	Air Moving Device			44H8259		
A02	Power Supply P04	Power Supply 650 Watt			5151	44H7777	See "FC 5033, FC 5034, and FC 5035 — 650 Watt (P03 and P04)" on page 663
A03	Power Supply P03	Power Supply 650 Watt			5151	44H7777	
A04	Power Supply P02	Power Supply 950 Watt				44H7779	See "FC 5033, FC 5034, and FC 5035 — 845 Watt (P01 and P02)" on page 663
B12	Backplane	Device Board					
B10	SPCN Card	SPCN Card					

Notes:

1. The 2720 workstation/communications adapter reports VPD twice; once for twinax and once for communications. Communications and twinax have different type numbers.
2. For workstation unit addresses --xx yyyz; xx is the port address (00-07), yy is the workstation address, and zz is the shared session.
3. Positions C04 and C05 are dual purpose. If the Integrated Netfinity Server for AS/400 (2850) is installed in position 7, then positions C04 and C05 are connected to the Integrated Netfinity Server for AS/400 (2850).

Table 31. FC 5034, FC 5035 SPD Expansion Unit - Internal Disk Unit Unit Addresses Table (Based on IOP type)

Position	DSA	Unit Addresses	
		IOP Types: 6502, 6512, 6530	IOP Types: 6532, 6533
F31	0005-01-00	0100 FFFF	0001 00FF
F32	0005-01-00	0200 FFFF	0002 00FF
F33	0005-01-00	0300 FFFF	0003 00FF
F34	0005-01-00	0400 FFFF	0004 00FF
F35	0005-01-00	0500 FFFF	0005 00FF
F41	0005-01-00	1100 FFFF	0101 00FF
F42	0005-01-00	1200 FFFF	0102 00FF
F43	0005-01-00	1300 FFFF	0103 00FF
F44	0005-01-00	1400 FFFF	0104 00FF
F45	0005-01-00	1500 FFFF	0105 00FF
F51	0005-01-00	2100 FFFF	0201 00FF
F52	0005-01-00	2200 FFFF	0202 00FF
F53	0005-01-00	2300 FFFF	0203 00FF
F54	0005-01-00	2400 FFFF	0204 00FF
F55	0005-01-00	2500 FFFF	0205 00FF

FC 5051 – Storage Expansion Unit

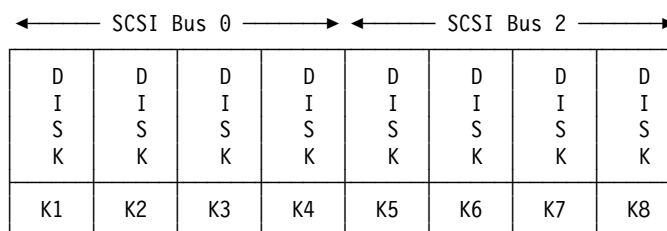


Figure 43. Front View

Note: Disk units 6109 (FC 1109, FC 6109), 6602 (FC 1602) and 6603 (FC 1603) can not be installed in disk unit positions K8 through K16 of the storage expansion unit.

Device	Location	6502/6512/6530 Unit Address	6532/6533 Unit Address
Disk	K1	0100 FFFF	0001 00FF
Disk	K2	0200 FFFF	0002 00FF
Disk	K3	0300 FFFF	0003 00FF
Disk	K4	0400 FFFF	0004 00FF
Disk	K5	2500 FFFF	0205 00FF
Disk	K6	2600 FFFF	0206 00FF

Device	Location	6502/6512/6530 Unit Address	6532/6533 Unit Address
Disk	K7	2700 FFFF	0207 00FF
Disk	K8	2800 FFFF	0208 00FF

FC 5052 and FC 5058 – Storage Expansion Unit

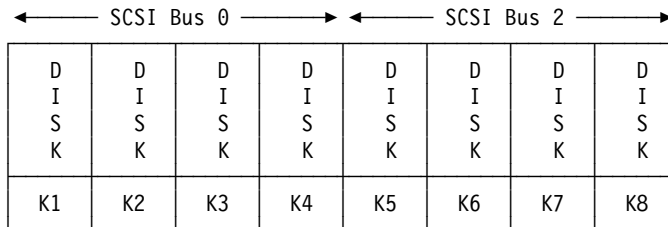


Figure 44. Front View

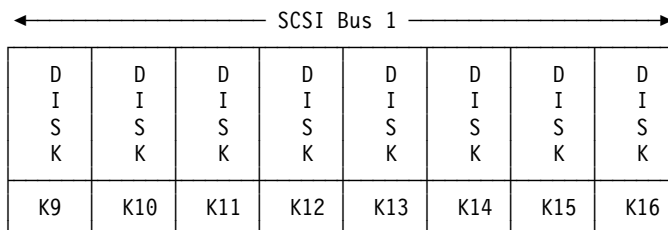


Figure 45. Rear View

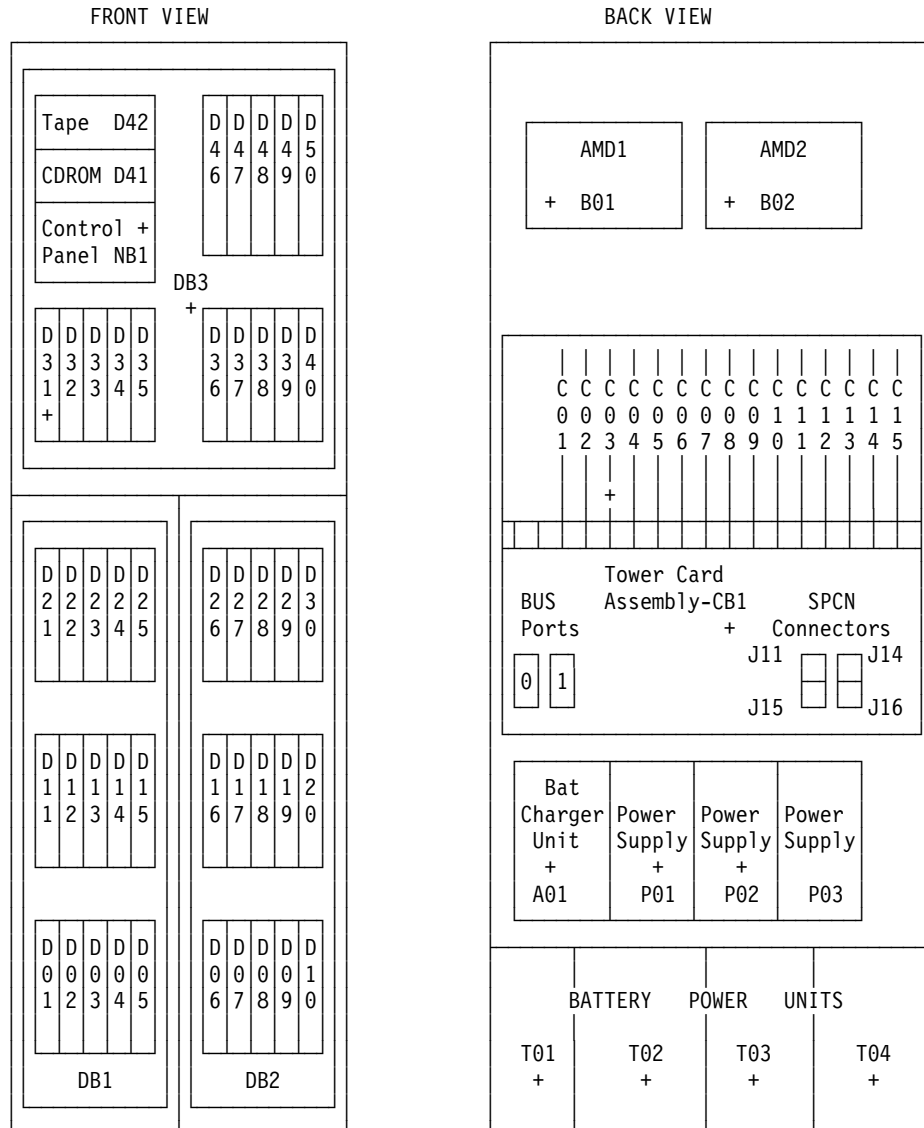
Note: Disk units 6109 (FC 1109, FC 6109), 6602 (FC 1602) and 6603 (FC 1603) can not be installed in disk unit positions K8 through K16 of the storage expansion unit.

Device	Location	6502/6512/6530 Unit Address	6532/6533 Unit Address
Disk	K1	0100 FFFF	0001 00FF
Disk	K2	0200 FFFF	0002 00FF
Disk	K3	0300 FFFF	0003 00FF
Disk	K4	0400 FFFF	0004 00FF
Disk	K5	2500 FFFF	0205 00FF
Disk	K6	2600 FFFF	0206 00FF
Disk	K7	2700 FFFF	0207 00FF
Disk	K8	2800 FFFF	0208 00FF
Disk	K9	1100 FFFF	0101 00FF
Disk	K10	1200 FFFF	0102 00FF
Disk	K11	1300 FFFF	0103 00FF
Disk	K12	1400 FFFF	0104 00FF
Disk	K13	1500 FFFF	0105 00FF

Device	Location	6502/6512/6530 Unit Address	6532/6533 Unit Address
Disk	K14	1600 FFFF	0106 00FF
Disk	K15	1700 FFFF	0107 00FF
Disk	K16	1800 FFFF	0108 00FF

FC 5065, FC 5066 – Expansion Tower

The following diagram shows the physical locations inside the FC 5065 expansion tower.



RM = Removable Media
+ = Minimum configuration

Figure 46. FC 5065 Expansion Tower

Table 32. FRU Positions and Failing Items, FC 506x Expansion Tower

FRU Positions and Failing Items, FC 506x Expansion Tower							
Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
					(See Type, Model and Part Number list for additional Types and Part Numbers.)		
C01	IOA	WAN/ LAN/ Twinax	xxxx-01-00	E0FF FFFF	See "Type, Model, and Part Number List" on page 750.	See "Cards – in FC 5065 or FC 5066" on page 617.	
C02	IOA	WAN/ LAN/ Twinax	xxxx-01-00	E1FF FFFF			
C03	CFIOP	I/O Processor	xxxx-01-00	FFFF FFFF			
C04	IOA	2838, ATM	xxxx-01-00	E7FF FFFF			
		Storage IOA		0FFF FFFF			
		WAN / LAN / Twinax		E7FF FFFF			
C05	IOA	2838, ATM	xxxx-01-00	ECFF FFFF			
		WAN / LAN / Twinax					
C06	High Speed IOA	WAN / LAN / Twinax	xxxx-02-00	E0FF FFFF			
C07	IOA	WAN / LAN / Twinax	xxxx-02-00	E1FF FFFF			
C08	CFIOP	I/O Processor	xxxx-02-00	FFFF FFFF			
C09	IOA	2838, ATM	xxxx-02-00	E7FF FFFF			
		Storage IOA		0FFF FFFF			
		WAN / LAN / Twinax		E7FF FFFF			
C10	IOA	2838, ATM	xxxx-02-00	ECFF FFFF			
		WAN / LAN / Twinax					
C11	IOA	WAN / LAN / Twinax	xxxx-03-00	E0FF FFFF			
C12	IOA	WAN / LAN / Twinax	xxxx-03-00	E1FF FFFF			
C13	CFIOP	I/O Processor	xxxx-03-00	FFFF FFFF			
C14	IOA	2838, ATM	xxxx-03-00	E7FF FFFF			
		Storage IOA		0FFF FFFF			
		WAN / LAN / Twinax		E7FF FFFF			
C15	IOA	2838, ATM	xxxx-03-00	ECFF FFFF			
		WAN / LAN / Twinax					
D01	Disk Unit	Disk Unit	xxxx-02-00	0003 00FF	See "Disk Unit Type, Model, and Part Number List" on page 756.	See "Disk Unit — Dedicated and Concurrent" on page 643.	
D02	Disk Unit	Disk Unit	xxxx-02-00	0004 00FF			
D03	Disk Unit	Disk Unit	xxxx-02-00	0005 00FF			

Table 32. FRU Positions and Failing Items, FC 506x Expansion Tower (continued)

FRU Positions and Failing Items, FC 506x Expansion Tower							
Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
					(See Type, Model and Part Number list for additional Types and Part Numbers.)		
D04	Disk Unit	Disk Unit	xxxx-02-00	0006 00FF			
D05	Disk Unit	Disk Unit	xxxx-02-00	0007 00FF			
D06	Disk Unit	Disk Unit	xxxx-03-00	0003 00FF			
D07	Disk Unit	Disk Unit	xxxx-03-00	0004 00FF			
D08	Disk Unit	Disk Unit	xxxx-03-00	0005 00FF			
D09	Disk Unit	Disk Unit	xxxx-03-00	0006 00FF			
D10	Disk Unit	Disk Unit	xxxx-03-00	0007 00FF			
D11	Disk Unit	Disk Unit	xxxx-02-00	0103 00FF			
D12	Disk Unit	Disk Unit	xxxx-02-00	0104 00FF			
D13	Disk Unit	Disk Unit	xxxx-02-00	0105 00FF			
D14	Disk Unit	Disk Unit	xxxx-02-00	0106 00FF			
D15	Disk Unit	Disk Unit	xxxx-02-00	0107 00FF			
D16	Disk Unit	Disk Unit	xxxx-03-00	0103 00FF			
D17	Disk Unit	Disk Unit	xxxx-03-00	0104 00FF			
D18	Disk Unit	Disk Unit	xxxx-03-00	0105 00FF			
D19	Disk Unit	Disk Unit	xxxx-03-00	0106 00FF			
D20	Disk Unit	Disk Unit	xxxx-03-00	0107 00FF			
D21	Disk Unit	Disk Unit	xxxx-02-00	0203 00FF			
D22	Disk Unit	Disk Unit	xxxx-02-00	0204 00FF			
D23	Disk Unit	Disk Unit	xxxx-02-00	0205 00FF			
D24	Disk Unit	Disk Unit	xxxx-02-00	0206 00FF			
D25	Disk Unit	Disk Unit	xxxx-02-00	0207 00FF			
D26	Disk Unit	Disk Unit	xxxx-03-00	0203 00FF			
D27	Disk Unit	Disk Unit	xxxx-03-00	0204 00FF			
D28	Disk Unit	Disk Unit	xxxx-03-00	0205 00FF			
D29	Disk Unit	Disk Unit	xxxx-03-00	0206 00FF			
D30	Disk Unit	Disk Unit	xxxx-03-00	0207 00FF			
D31	Disk Unit	Disk Unit	xxxx-01-00	0001 00FF			
D32	Disk Unit	Disk Unit	xxxx-01-00	0002 00FF			
D33	Disk Unit	Disk Unit	xxxx-01-00	0003 00FF			
D34	Disk Unit	Disk Unit	xxxx-01-00	0004 00FF			
D35	Disk Unit	Disk Unit	xxxx-01-00	0005 00FF			
D36	Disk Unit	Disk Unit	xxxx-01-00	0103 00FF			
D37	Disk Unit	Disk Unit	xxxx-01-00	0104 00FF			
D38	Disk Unit	Disk Unit	xxxx-01-00	0105 00FF			
D39	Disk Unit	Disk Unit	xxxx-01-00	0106 00FF			
D40	Disk Unit	Disk Unit	xxxx-01-00	0107 00FF			
D41	Optical	CD-ROM or DVD	xxxx-01-00	0006 00FF			

Table 32. FRU Positions and Failing Items, FC 506x Expansion Tower (continued)

FRU Positions and Failing Items, FC 506x Expansion Tower							
Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
					(See Type, Model and Part Number list for additional Types and Part Numbers.)		
D42	Tape	Tape	xxxx-01-00	0007 00FF			
D46	Disk Unit	Disk Unit	xxxx-01-00	0203 00FF			
D47	Disk Unit	Disk Unit	xxxx-01-00	0204 00FF			
D48	Disk Unit	Disk Unit	xxxx-01-00	0205 00FF			
D49	Disk Unit	Disk Unit	xxxx-01-00	0206 00FF			
D50	Disk Unit	Disk Unit	xxxx-01-00	0207 00FF			

FC 5070, FC 5071, FC 5072, and FC 5073 – System Unit Expansion Tower

Note: **** in a location indicates a minimum configuration.

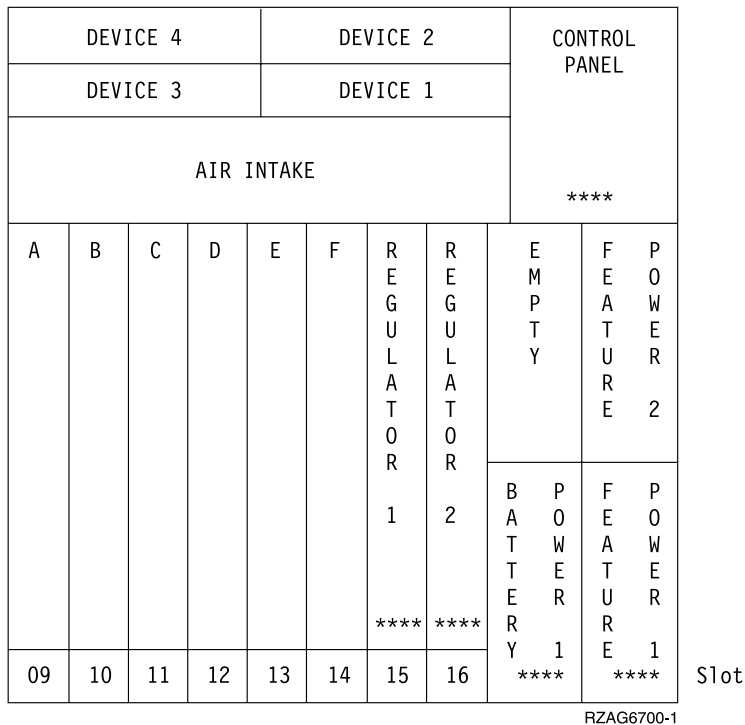


Figure 47. Front View

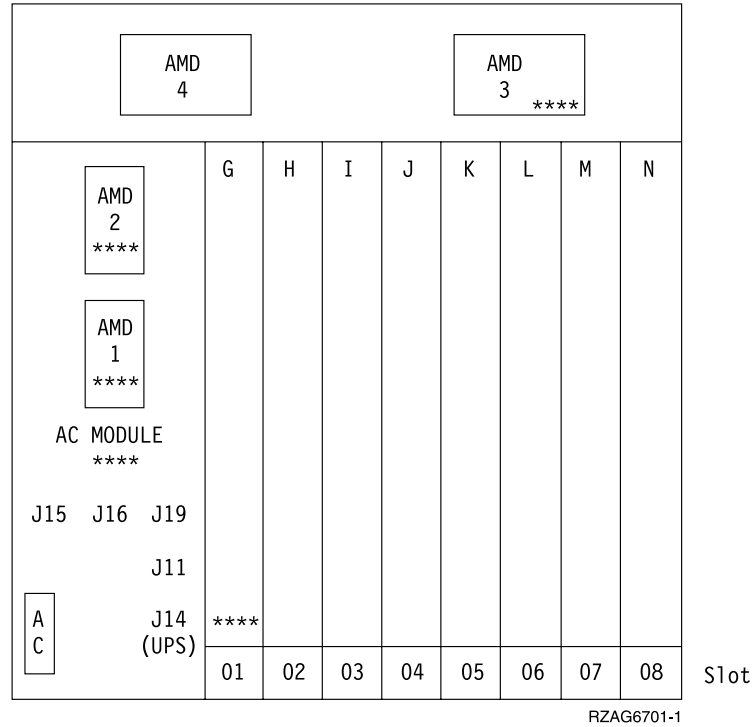
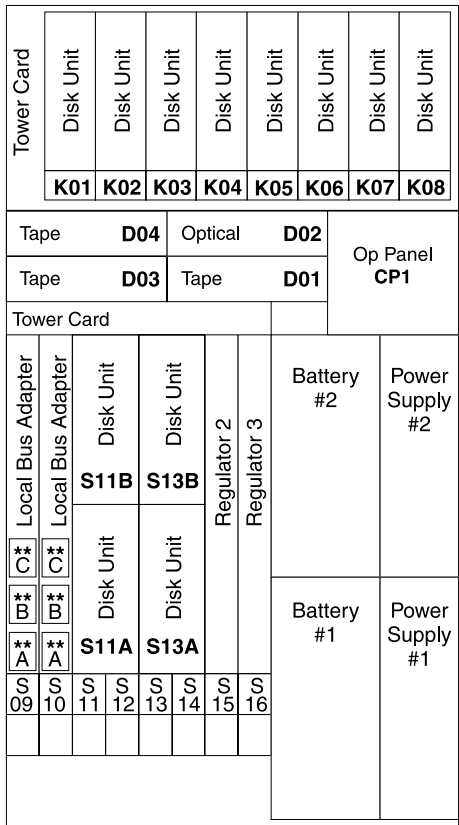


Figure 48. Rear View

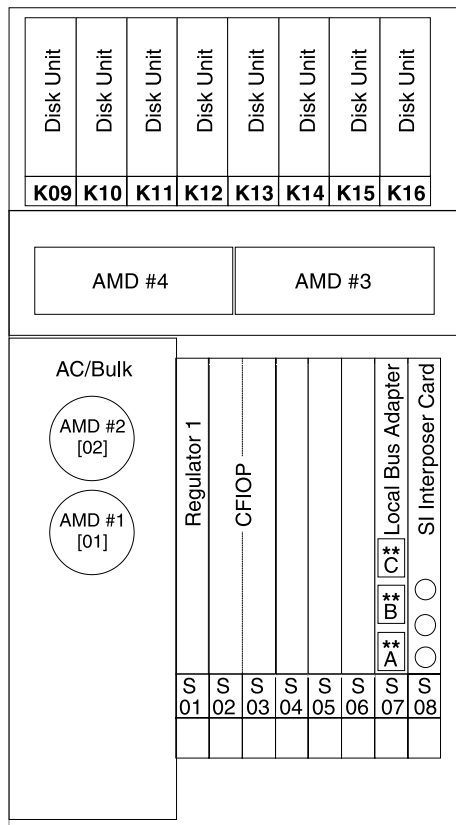
Note: In the following list, DSA means Direct Select Address, and UA means Unit Address.

- Device 1 (UA=0700 FFFF)
- Device 2 (UA=0600 FFFF)
- Device 3 (UA=0500 FFFF)
- Device 4 (UA=0400 FFFF)
- A Feature IOP (DSA=xxxx-08-00 UA=FFFF FFFF)
- B Feature IOP (DSA=xxxx-09-00 UA=FFFF FFFF)
- C Feature IOP (DSA=xxxx-0A-00 UA=FFFF FFFF)
- D Feature IOP (DSA=xxxx-0B-00 UA=FFFF FFFF)
- E Feature IOP (DSA=xxxx-0C-00 UA=FFFF FFFF)
- F Feature IOP (DSA=xxxx-0D-00 UA=FFFF FFFF)
- G Optical Bus Adapter (DSA=xxxx-00-00 UA=FFFF FFFF)
- H Feature IOP or MSIOP (DSA=xxxx-01-00 UA=FFFF FFFF)
- I Feature IOP or Internal Tape IOP (DSA=xxxx-02-00 UA=FFFF FFFF)
- J Feature IOP (DSA=xxxx-03-00 UA=FFFF FFFF)
- K Feature IOP (DSA=xxxx-04-00 UA=FFFF FFFF)
- L Feature IOP (DSA=xxxx-05-00 UA=FFFF FFFF)
- M Feature IOP (DSA=xxxx-06-00 UA=FFFF FFFF)
- N Feature IOP (DSA=xxxx-07-00 UA=FFFF FFFF)

FC 5077 – Migrated Tower Base Unit



Front



Back

JTAGC
HSL 1
HSL 0

** - Optical Bus Driver Card

RZAQ2513-5

Figure 49. FC 5077 Migrated Tower

Table 33. FRU Positions and Failing Items, FC 5077 Migrated Tower, Front

Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
Backplane	Tower Card	Card Enclosure or Backplane - or - Device Board				21H7465	"FC 5077 Tower Card Assembly" on page 603
K01	Disk Unit	Disk Unit	0004-01-00	0201 00FF	See "Disk Unit Type, Model, and Part Number List" on page 756.		"Disk Unit — Dedicated and Concurrent" on page 643
K02	Disk Unit	Disk Unit	0004-01-00	0202 00FF			
K03	Disk Unit	Disk Unit	0004-01-00	0203 00FF			
K04	Disk Unit	Disk Unit	0004-01-00	0204 00FF			
K05	Disk Unit	Disk Unit	0004-01-00	0205 00FF			

Table 33. FRU Positions and Failing Items, FC 5077 Migrated Tower, Front (continued)

Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
K06	Disk Unit	Disk Unit	0004-01-00	0206 00FF			
K07	Disk Unit	Disk Unit	0004-01-00	0207 00FF			
K08	Disk Unit	Disk Unit	0004-01-00	0208 00FF			
D01	Tape	Tape	0004-01-00	0007 00FF	See "Type, Model, and Part Number List" on page 750.		"Removable Media — Dedicated and Concurrent" on page 666
D02	Optical	Optical	0004-01-00	0006 00FF			
D03	Tape	Tape	0004-02-00	0700 FFFF			
D04	Tape	Tape	0004-02-00	0600 FFFF			
S09	Local Bus Adapter	Local Bus Adapter - OR - HSL (SI) I/O Adapter	SPD busses 5-10 decimal or 0005-000A hex as in the DSA		2696	21H6529	"Cards – in FC 5077" on page 618
S09A	SPD Optical Bus Driver	Optical Link Card - OR - SPD Optical Bus Driver Card	SPD busses 9-10 decimal or 0009-000A hex as in the DSA		2686 2688	87G5316 87G5560	
S09B	SPD Optical Bus Driver	Optical Link Card - OR - SPD Optical Bus Driver	SPD busses 0007-0008		2686 2688	87G5316 87G5560	
S09C	SPD Optical Bus Driver	Optical Link Card - OR - SPD Optical Bus Driver	SPD busses 0005-0006		2686 2688	87G5316 87G5560	
S10	Local Bus Adapter	Local Bus Adapter - OR - SPD HSL (SI) I/O Adapter	SPD busses 17-22 decimal or 0011-0016 hex as in the DSA		2695	87G5400	
S10A	SPD Optical Bus Driver	Optical Link Card - OR - SPD Optical Bus Driver	SPD busses 21-22 decimal or 0015-0016 hex as in the DSA		2686 2688	87G5316 87G5560	

Table 33. FRU Positions and Failing Items, FC 5077 Migrated Tower, Front (continued)

Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
S10B	SPD Optical Bus Driver	Optical Link Card - OR - SPD Optical Bus Driver	SPD busses 19-20 decimal or 0013-0014 hex as in the DSA		2686 2688	87G5316 87G5560	
S10C	SPD Optical Bus Driver	Optical Link Card - OR - SPD Optical Bus Driver	SPD busses 17-18 decimal or 0011-0012 hex as in the DSA		2686 2688	87G5316 87G5560	
S11A	Disk Unit	Disk Unit	0004-01-00	0001 00FF	See "Disk Unit Type, Model, and Part Number List" on page 756.		"Disk Unit — Dedicated and Concurrent" on page 643
S11B	Disk Unit	Disk Unit	0004-01-00	0002 00FF			
S13A	Disk Unit	Disk Unit	0004-01-00	0003 00FF			
S13B	Disk Unit	Disk Unit	0004-01-00	0004 00FF			
S15	Power Regulator 2	Power Regulator			2713	21H4829	"Cards – in FC 5077" on page 618
S16	Power Regulator 3	Power Regulator			2713	21H4829	
Battery 1	Battery 1	Battery				86G8040	"Battery" on page 607
Battery 2	Battery 2	Battery					
Bulk 1	Bulk 1	Bulk Power Supply					"Power Supply" on page 662
Bulk 2	Bulk 2	Bulk Power Supply					
CP1	Panel	Control Panel					"Control Panel Assembly" on page 636

Table 34. FRU Positions and Failing Items, FC 5077 Migrated Tower, Back

Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
Backplane	Tower Card	Card Enclosure or Backplane				21H7465	"FC 5077 Tower Card Assembly" on page 603
		Device Board					

Table 34. FRU Positions and Failing Items, FC 5077 Migrated Tower, Back (continued)

Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
K09	Disk Unit	Disk Unit	0004-01-00	0101 00FF	See "Disk Unit Type, Model, and Part Number List" on page 756.		"Disk Unit — Dedicated and Concurrent" on page 643
K10	Disk Unit	Disk Unit	0004-01-00	0102 00FF			
K11	Disk Unit	Disk Unit	0004-01-00	0103 00FF			
K12	Disk Unit	Disk Unit	0004-01-00	0104 00FF			
K13	Disk Unit	Disk Unit	0004-01-00	0105 00FF	See "Disk Unit Type, Model, and Part Number List" on page 756.		"Disk Unit — Dedicated and Concurrent" on page 643
K14	Disk Unit	Disk Unit	0004-01-00	0106 00FF			
K15	Disk Unit	Disk Unit	0004-01-00	0107 00FF			
K16	Disk Unit	Disk Unit	0004-01-00	0108 00FF			
AMD1	AMD1	Air Moving Device			46G3510		"AMDs (Air Moving Devices)" on page 595
AMD2	AMD2	Air Moving Device			46G3510		
AMD3	AMD3	Air Moving Device			46G3587		
AMD4	AMD4	Air Moving Device			46G3587		
AC MODULE	AC MODULE	AC module				21H7697	"AC Module" on page 594
S01	Power Regulator 1	Power Regulator			2713	21H4829	"Cards – in FC 5077" on page 618
S02-S03	Combined Function IOP	Combined Function IOP	0004-01-00				
S04	Feature IOP / Alt IPL	I/O Processor	0004-02-00		See "Type, Model, and Part Number List" on page 750.		"Cards – in FC 5077" on page 618
S05	Feature IOP	I/O Processor	0004-04-00				
S06	Feature IOP	I/O Processor	0004-05-00				
S07	Local Bus Adapter	Local Bus Adapter - OR - HSL (SI) I/O Adapter	SPD busses 11-16 decimal or 000B-0010 hex as in the DSA		2695	87G5400	
S07A	SPD Optical Bus Driver	Optical Link Card - OR - SPD Optical Bus Driver	SPD busses 15-16 decimal or 000F-0010 hex as in the DSA		2686 2688	87G5316 87G5560	"Cards – in FC 5077" on page 618

Table 34. FRU Positions and Failing Items, FC 5077 Migrated Tower, Back (continued)

Position	FRU Name	Possible Failing Item(s)	DSA (BBBBcbb)	Unit Address	Order Information		Removal and Installation Procedure
					Type / CCIN	Part Number	
S07B	SPD Optical Bus Driver	Optical Link Card - OR - SPD Optical Bus Driver	SPD busses 13-14 decimal or 000D-000E hex as in the DSA		2686 2688	87G5316 87G5560	
S07C	SPD Optical Bus Driver	Optical Link Card - OR - SPD Optical Bus Driver	SPD busses 11-12 decimal or 000B-000C hex as in the DSA		2686 2688	87G5316 87G5560	
S08	HSL (SI) Interposer Card	HSL (SI) Interposer Card			272A	21H7623	

FC 5080, 5081, 5082, or 5083 – Storage Expansion Tower

Notes:

1. **** in a location indicates a minimum configuration.
2. Disk units 6109 (FC 1109, FC 6109), 6602 (FC 1602) and 6603 (FC 1603) can not be installed in disk unit positions K8 through K16 of the storage expansion unit.
3. Figure 50 on page 715 is shown with FC 5052/5058 installed.
4. Figure 51 on page 716 is shown with FC 5052/5058 installed.

DISK K1		DISK K2		DISK K3		DISK K4		DISK K5		DISK K6		DISK K7		DISK K8					
DEVICE 1 09C				DEVICE 2 11C				DEVICE 3 13C				DEVICE 4 15C				CONTROL PANEL ****			
DISK 2 09B				DISK 4 11B				DISK 6 13B				DISK 8 15B				E M P T Y		F P O W E R U R E 2	
DISK 1 09A				DISK 3 11A				DISK 5 13A				DISK 7 15A				B A T T E R Y 1 ****		F P O W E R U R E 1 ****	
09	10	11	12	13	14	15	16	****		****		****		****		Slot			

RZAG6702-0

Figure 50. Front View

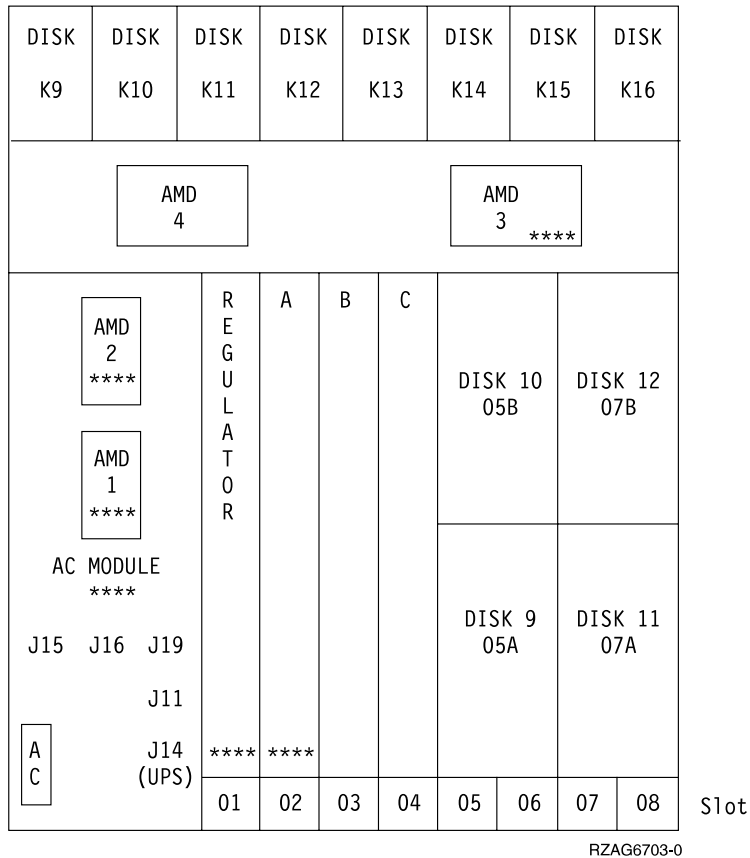


Figure 51. Rear View

A(card position 02) SPD Optical Bus Receiver (DSA=xxxx-00-00 UA=FFFF FFFF)
 BB (card position 03) MSIOP (DSA=xxxx-01-00 UA=FFFF FFFF):

	DSA (BBBBCbbb)	6502, 6512, 6530 Unit Address	6532/6533 Unit Address		DSA (BBBBCbbb)	6502, 6512, 6530 Unit Address	6532/6533 Unit Address
Device 1 09C	xxxx-01-00	0700 FFFF	0007 00FF	Device 2 11C	xxxx-01-00	0600 FFFF	0006 00FF
Device 3 13C	xxxx-01-00	0500 FFFF	0005 00FF	Device 4 15C	xxxx-01-00	0400 FFFF	0004 00FF

	DSA (BBBBcbb)	6502, 6512, 6530 Unit Address	6532/6533 Unit Address		DSA (BBBBcbb)	6502, 6512, 6530 Unit Address	6532/6533 Unit Address
Disk 1 09A	xxxx-01-00	2100 FFFF	0201 00FF	Disk 2 09B	xxxx-01-00	1100 FFFF	0101 00FF
Disk 3 11A	xxxx-01-00	2200 FFFF	0202 00FF	Disk 4 11B	xxxx-01-00	1200 FFFF	0102 00FF
Disk 5 13A	xxxx-01-00	2300 FFFF	0203 00FF	Disk 6 13B	xxxx-01-00	1300 FFFF	0103 00FF
Disk 7 15A	xxxx-01-00	2400 FFFF	0204 00FF	Disk 8 15B	xxxx-01-00	1400 FFFF	0104 00FF
Disk 9 05A	xxxx-01-00	2500 FFFF	0205 00FF	Disk 10 05B	xxxx-01-00	1500 FFFF	0105 00FF
Disk 11 07A	xxxx-01-00	2600 FFFF	0206 00FF	Disk 12 07B	xxxx-01-00	1600 FFFF	0106 00FF

CC (card position 04) MSIOP (DSA=xxxx-02-00 UA=FFFF FFFF):

	DSA (BBBBcbb)	6502, 6512, 6530 Unit Address	6532/6533 Unit Address		DSA (BBBBcbb)	6502, 6512, 6530 Unit Address	6532/6533 Unit Address
Disk K1	xxxx-02-00	0100 FFFF	0001 00FF	Disk K9	xxxx-02-00	1100 FFFF	0101 00FF
Disk K2	xxxx-02-00	0200 FFFF	0002 00FF	Disk K10	xxxx-02-00	1200 FFFF	0102 00FF
Disk K3	xxxx-02-00	0300 FFFF	0003 00FF	Disk K11	xxxx-02-00	1300 FFFF	0103 00FF
Disk K4	xxxx-02-00	0400 FFFF	0004 00FF	Disk K12	xxxx-02-00	1400 FFFF	0104 00FF
Disk K5	xxxx-02-00	2500 FFFF	0205 00FF	Disk K13	xxxx-02-00	1500 FFFF	0105 00FF
Disk K6	xxxx-02-00	2600 FFFF	0206 00FF	Disk K14	xxxx-02-00	1600 FFFF	0106 00FF
Disk K7	xxxx-02-00	2700 FFFF	0207 00FF	Disk K15	xxxx-02-00	1700 FFFF	0107 00FF
Disk K8	xxxx-02-00	2800 FFFF	0208 00FF	Disk K16	xxxx-02-00	1800 FFFF	0108 00FF

Power and Signal Cables

FC 5033 Migrated Tower Base Unit

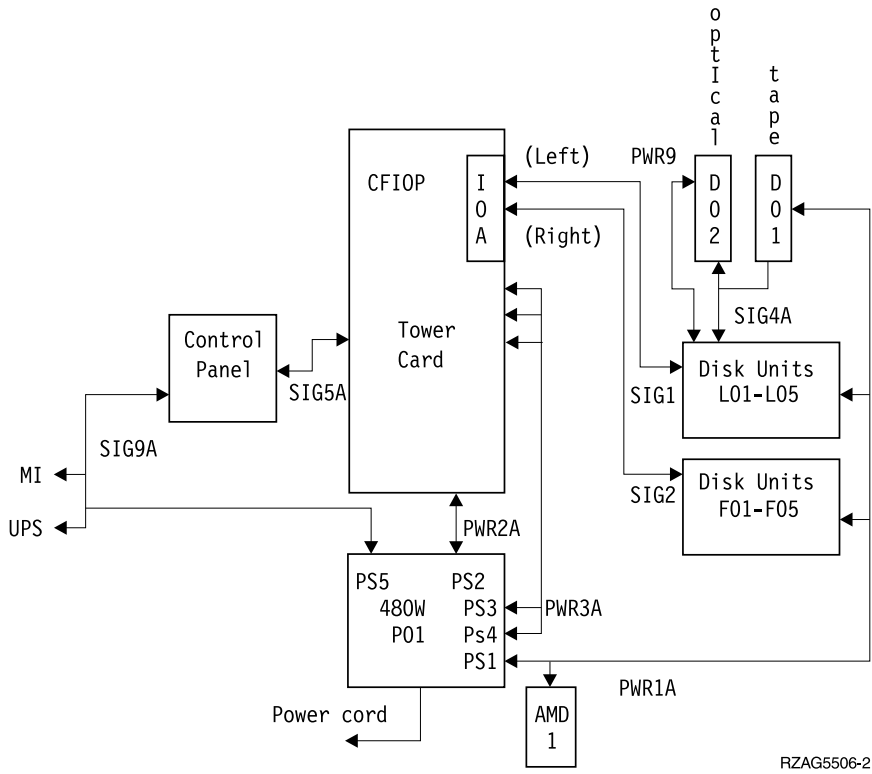
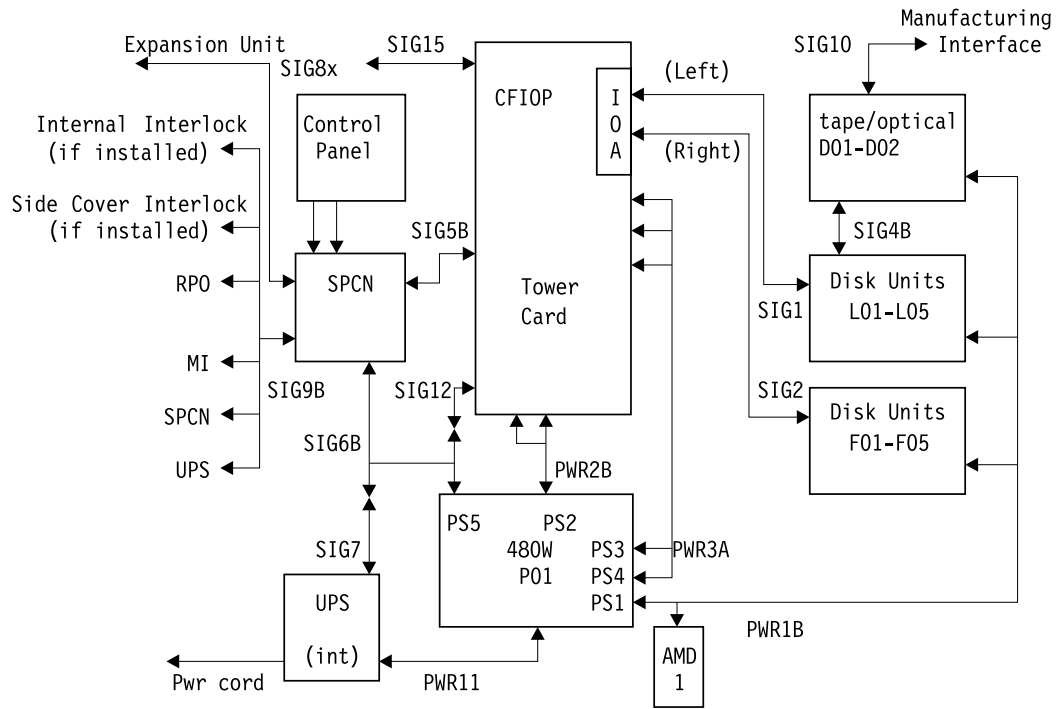


Figure 52. FC 5033 Migrated Tower Base Unit

For cable part number information see "Cables and Miscellaneous" on page 819.

FC 5034 Migrated Tower Base Unit



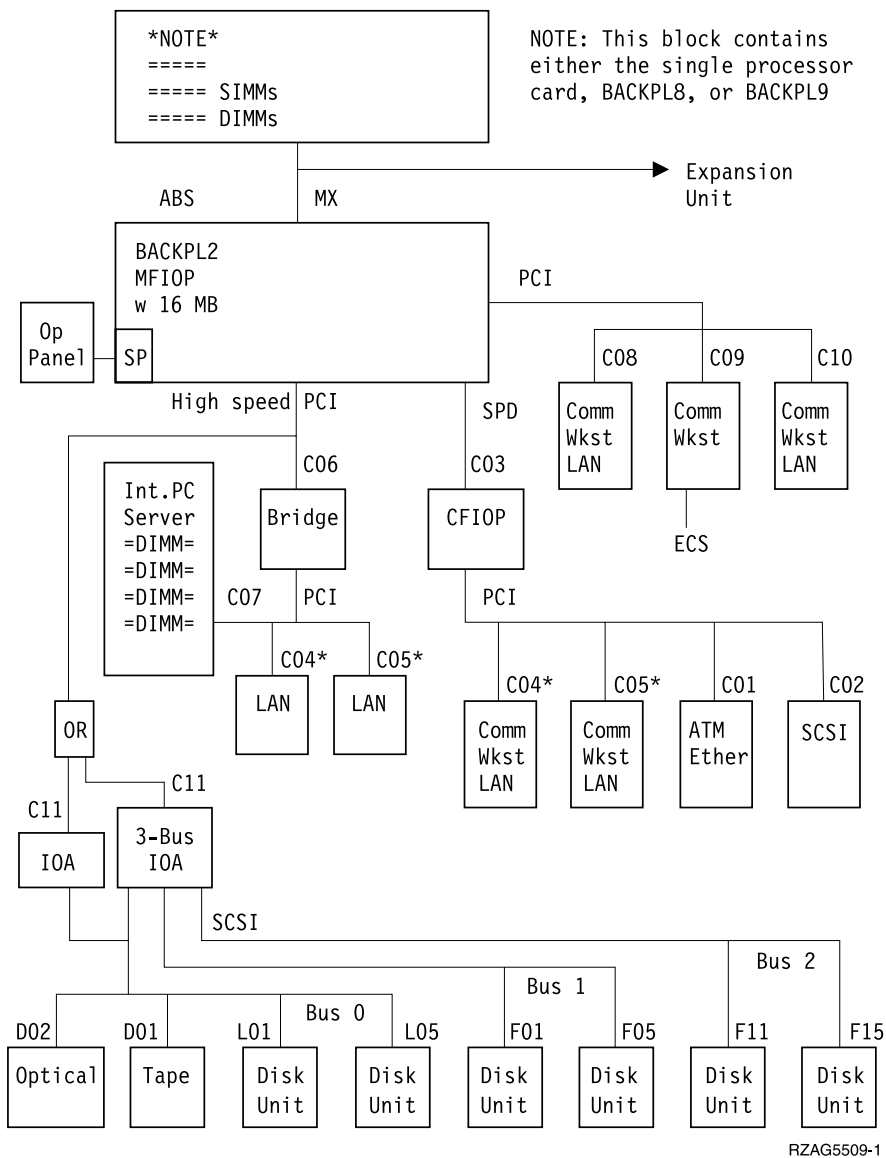
AMD = Air Moving Device

RZAG5507-2

Figure 53. FC 5034 Migrated Tower Base Unit

For cable part number information see "Cables and Miscellaneous" on page 819.

FC 5035 Migrated Tower Base Unit



RZAG5509-1

Figure 54. FC 5035 Migrated Tower Base Unit

For cable part number information see “Cables and Miscellaneous” on page 819.

The illustration below shows where the external cable connectors (RPO, MI, SPCN and UPS) are located.

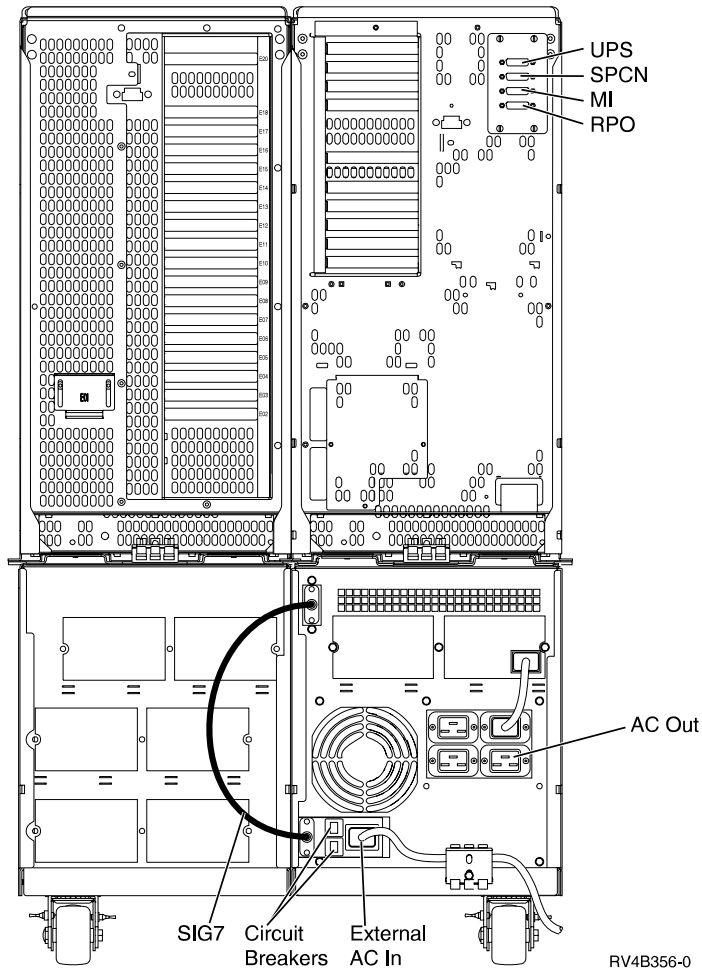
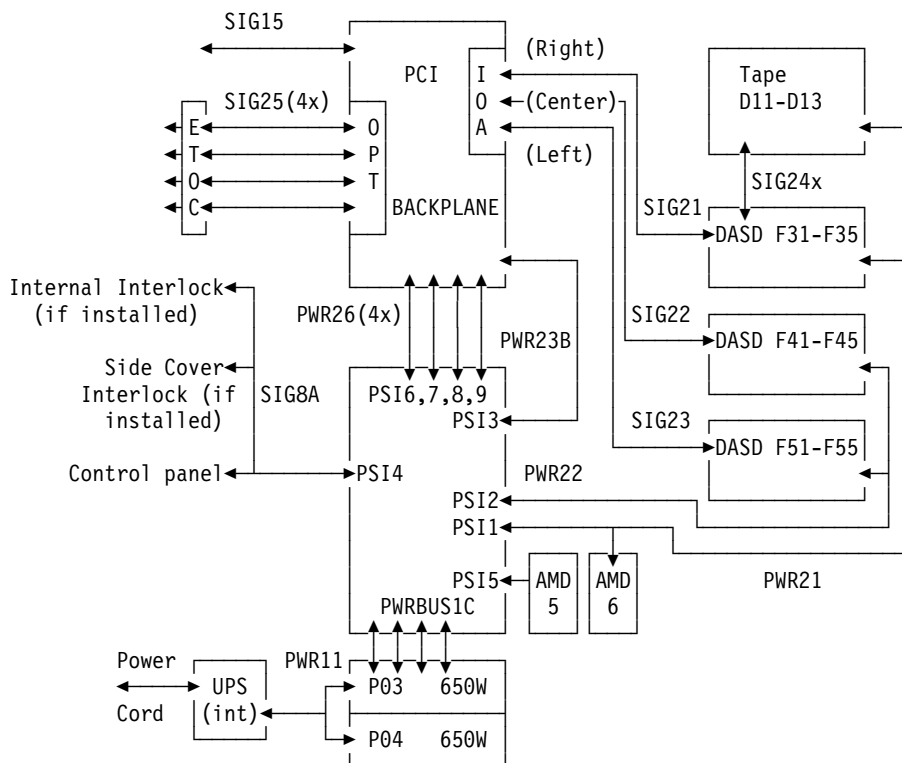


Figure 55. External Cable Connections (note: The FC 5033 Migrated Tower Base Unit does not have RPO and SPCN connectors)

FC 5034, FC 5035 PCI Exansion Unit

The following is a block diagram of the power and signal cables for a PCI bus expansion unit.



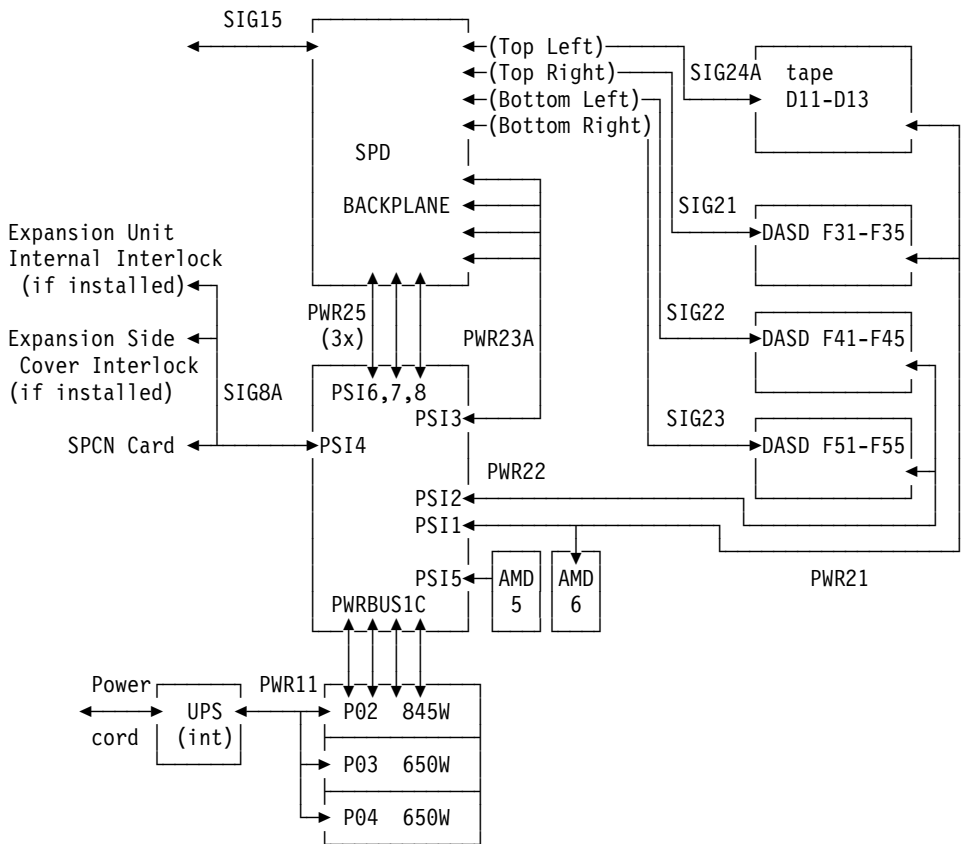
AMD = Air Moving Device
 OPT = Optical Bus Card ETOC = Expansion Tower Optical Connector

Figure 56. FC 5034, FC 5035 PCI Expansion Unit

For cable part number information see "Cables and Miscellaneous" on page 819.

FC 5034, FC 5035 SPD Expansion Unit

The following is a block diagram of the power and signal cables for a PCI bus expansion unit.



AMD = Air Moving Device

Figure 57. FC 5034, FC 5035 SPD Expansion Unit

For cable part number information see “Cables and Miscellaneous” on page 819.

FC 5065 or 5066 Expansion Tower

The following diagram shows the power cables for a FC 5065 or 5066 expansion tower.

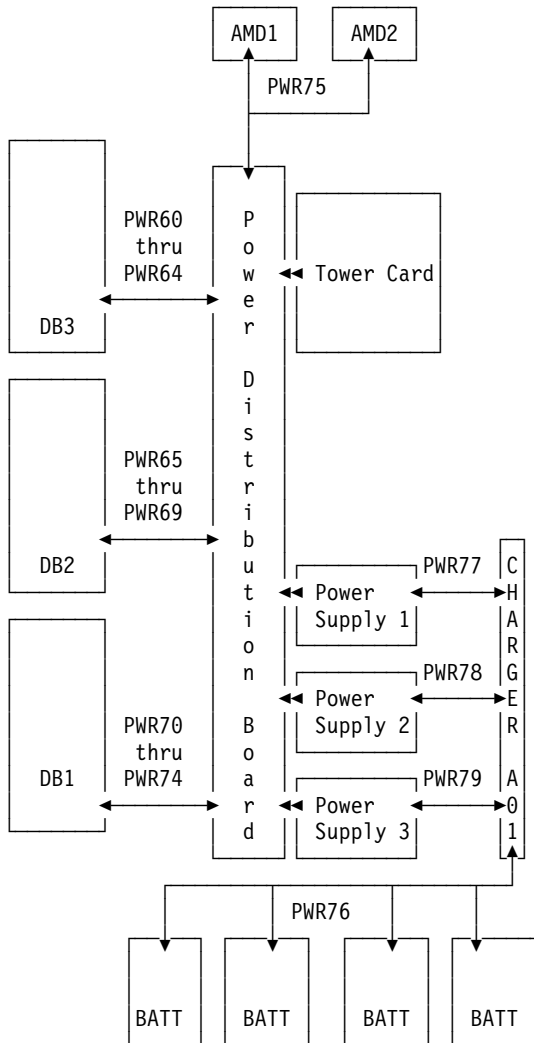


Figure 58. FC 5065 or 5066 Power cables

The following diagram shows the signal cables for a FC 5065 or 5066 expansion tower.

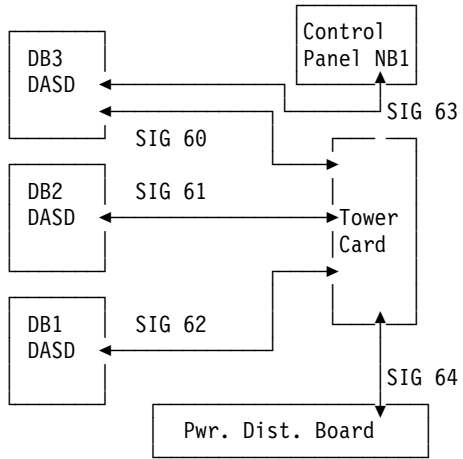


Figure 59. FC 5065 or 5066 Signal cables

System Unit Expansion Tower (FC 5070, 5072) with Storage Expansion Unit (FC 505x)

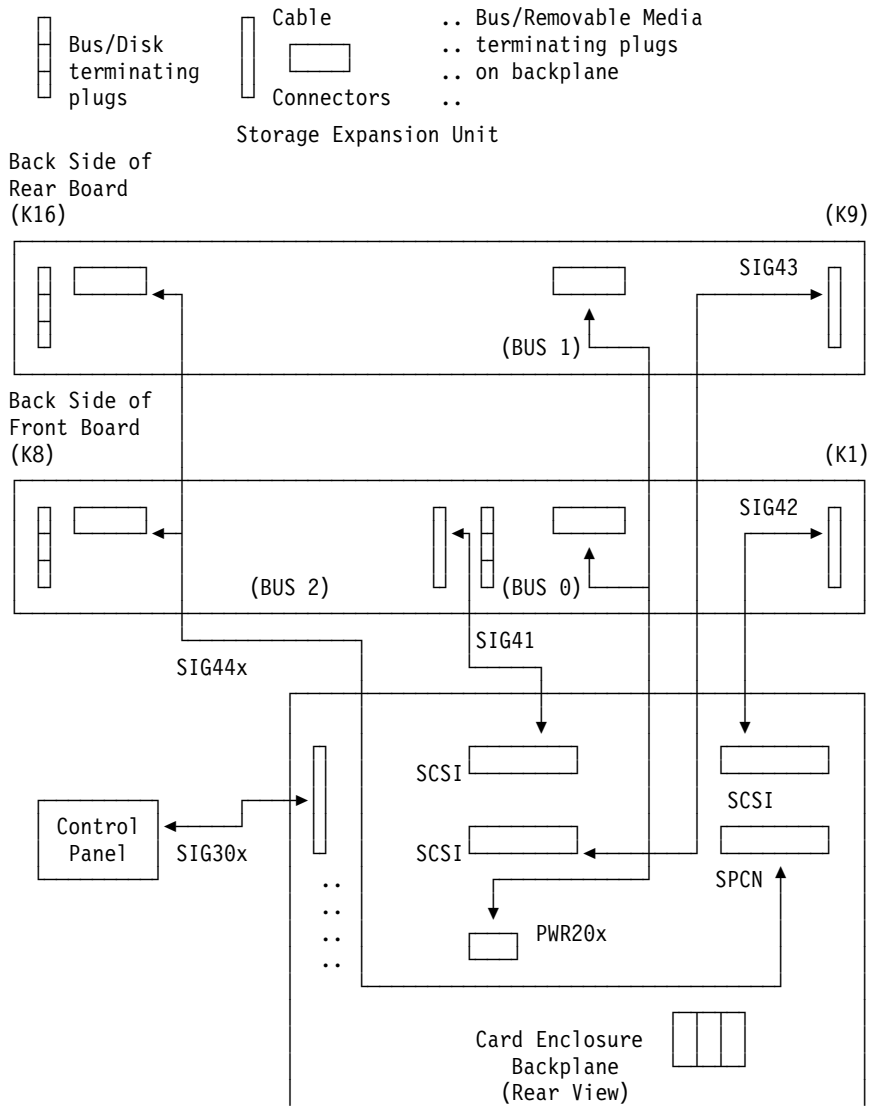


Figure 60. System Unit Expansion Tower (FC 5070, 5072) with Storage Expansion Unit (FC 505x)

Storage Expansion Tower (FC 5080, 5082) with Storage Expansion Unit (FC 505x)

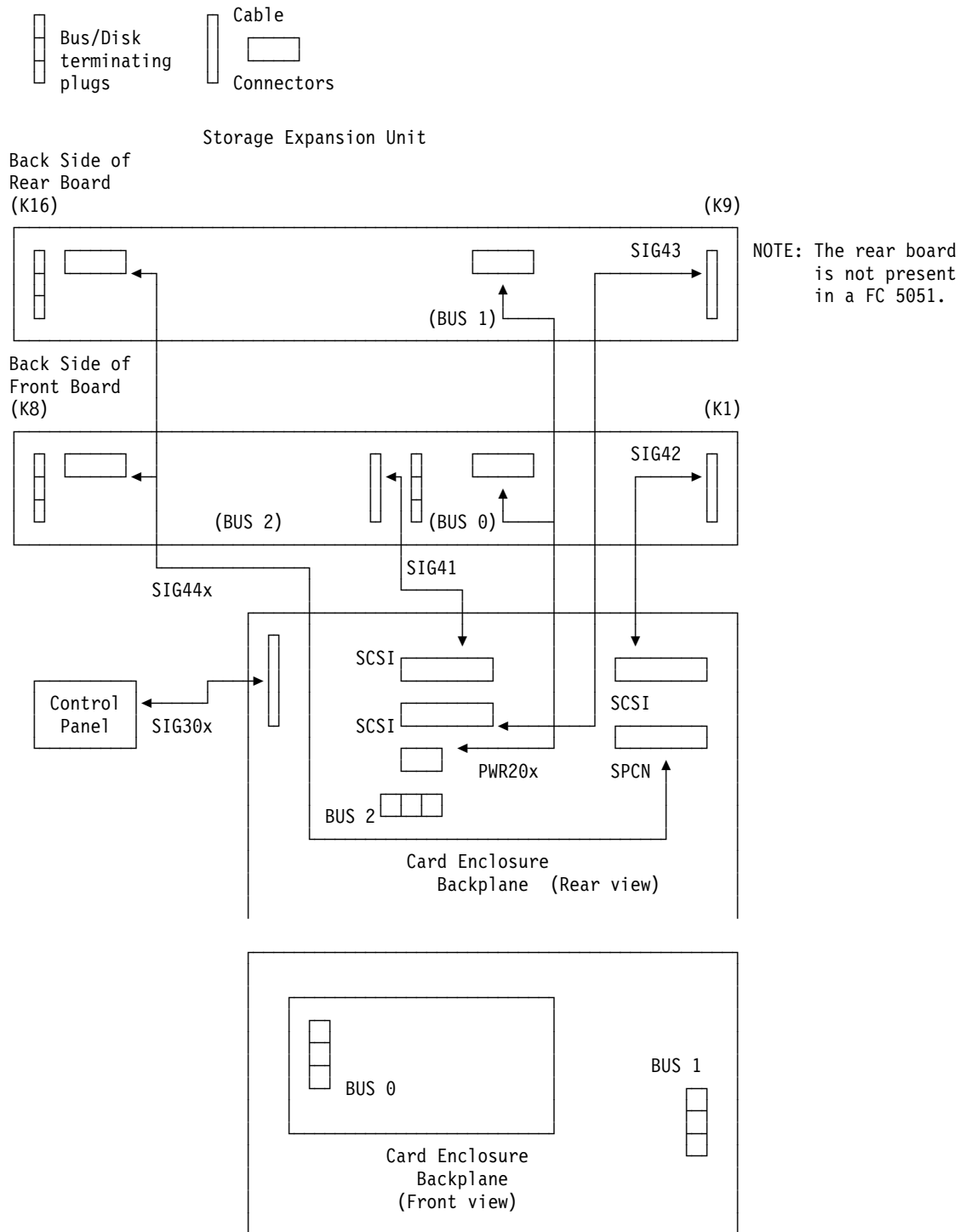


Figure 61. Storage Expansion Tower (FC 5080, 5082) with Storage Expansion Unit (FC 505x)

System Unit Expansion Tower (FC 5071, 5073) and Storage Expansion Tower (FC5081, 5083) with Storage Expansion Unit (FC 5058)

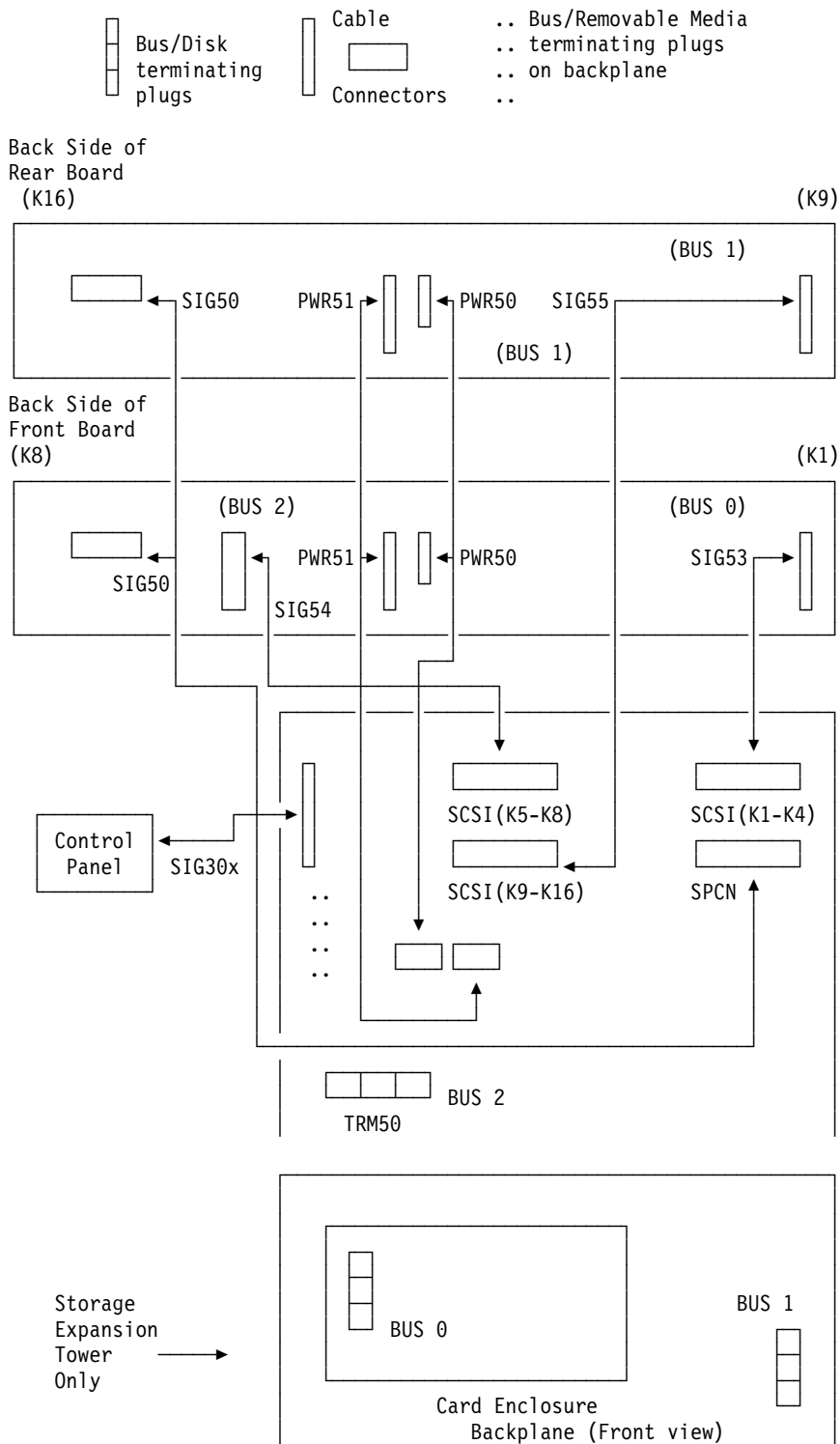


Figure 62. System Unit Expansion Tower (FC 5071, 5073) and Storage Expansion Tower (FC5081, 5083) with Storage Expansion Unit (FC 5058)

I/O Adapters

High and Low Speed PCI IOAs

The following table shows the PCI IOA types with descriptions and speeds.

Table 35. PCI IOAs

IOA Type	Description	Speed
2718	External removable media controller	High
2720	2-line communications and twinaxial workstation	Low
2721	2-line communications	Low
2722	Twinaxial workstation	Low
2723	Ethernet	Low or High
2724	Token Ring	Low or High
2726	Internal RAID disk, tape, optical controller	High
2728	Internal disk, tape, optical controller	High
2729	External tape controller	High
2740	Internal RAID disk, tape, optical controller	High
2741	Internal RAID disk, tape, optical controller	High
2745	2-line communications	Low or High
2746	Twinaxial IOA	Low or High
2748	Internal RAID disk, tape, optical controller	High
2750	ISDN Communications IOA	Low or High
2751	ISDN Communications IOA	Low or High
2761	Integrated Modem IOA	Low or High
2838	Ethernet	High
4758	Encryption IOA	High

Integrated Netfinity for AS/400 Server (IOA) Switch Settings:

166 MHz (has a cooling AMD on the card)

Press the switch at the TOP to turn it ON.

Press the switch at the BOTTOM to turn it OFF.

1	2	3	4	5	6
0	0	0	0	0	0
N	N	F	N	F	F
		F		F	F
OFF					

133 MHz (no cooling AMD on the card)

Press the switch at the TOP to turn it ON.

Press the switch at the BOTTOM to turn it OFF.

1	2	3	4	5	6
0	0	0	0	0	0
N	F	F	N	F	F
	F	F		F	F
OFF					

Figure 63. Switch Settings

Note: The 200 MHz and the 333 MHz Integrated Netfinity for AS/400 Server cards do not have switches and do not require jumpers.

2623/2629:

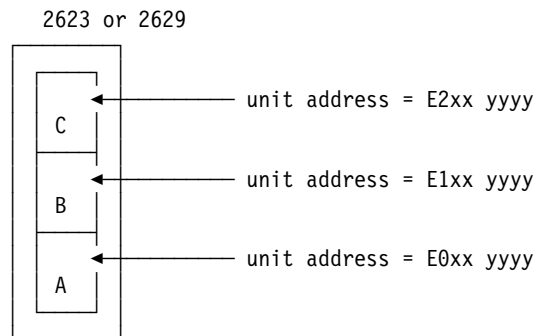


Figure 64. 2623/2629 Plugging

6510/6520:

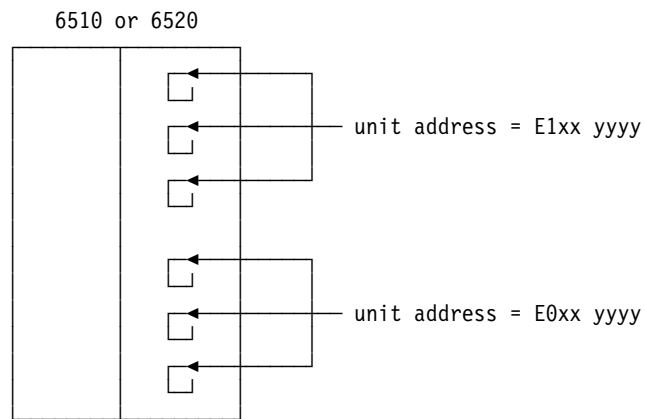


Figure 65. 6510/6520 Plugging

6616:

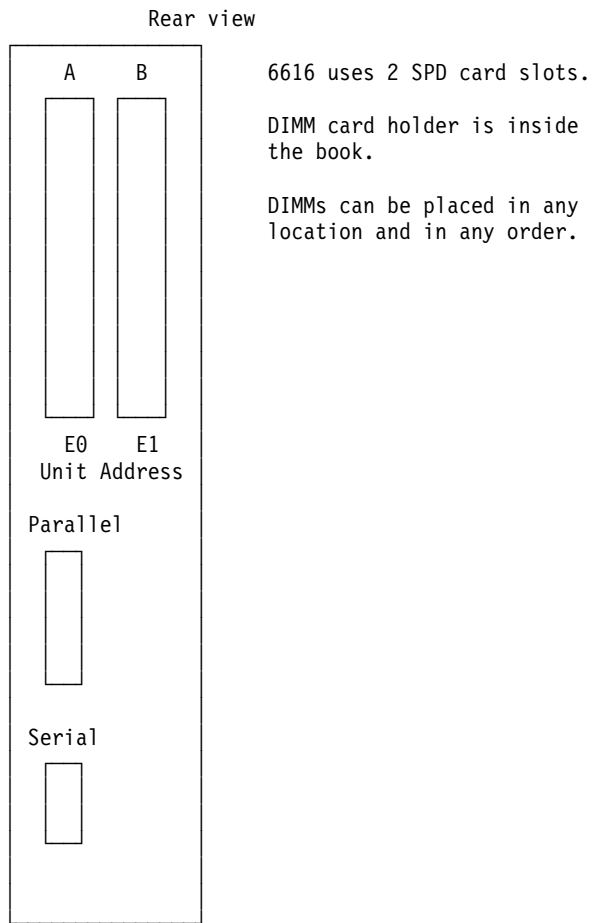
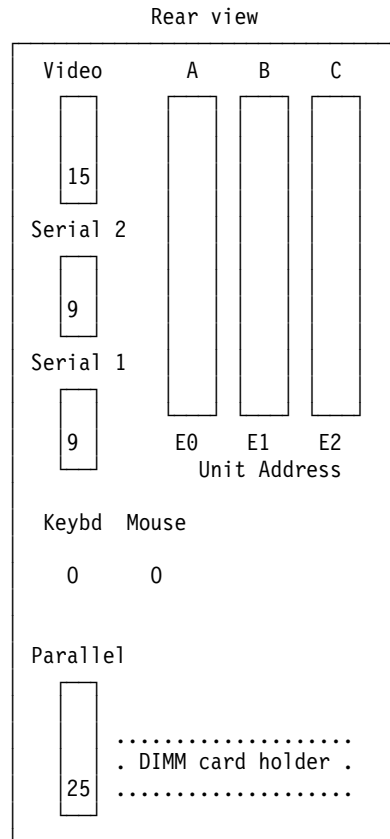


Figure 66. 6616 Plugging

6617:



6617 requires 3 SPD card slots.

Slots A, B, C are PCI card slots

(Note: Slot C is used only by Windows NT)

DIMM card holder is inside the book.

DIMM plugging order
 DIMM 3, 2, 1, 0

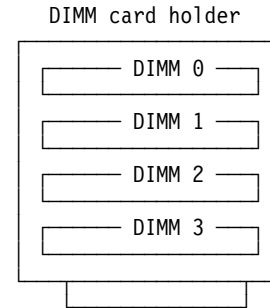


Figure 67. 6617 Plugging

unit address = E2xx yyyy	Cache Adapter (no unit address)
unit address = E1xx yyyy	
unit address = E0xx yyyy	

RZAG6508-1

Figure 68. 671A

2750/2751 and 2761 Adapter Card Port Connector Locations



FC 2750 and FC 2751 Card

The locations are numbered 4 to 1 (Left to Right)



FC 2761 Card

The locations are numbered 8 to 1 (Left to Right)

External Devices

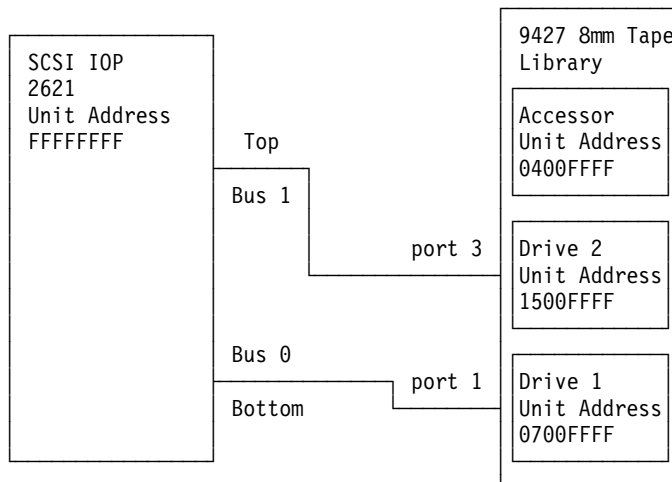
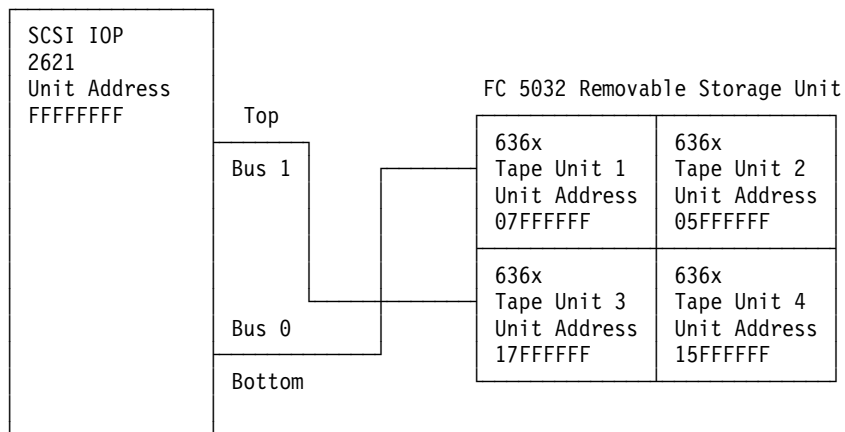
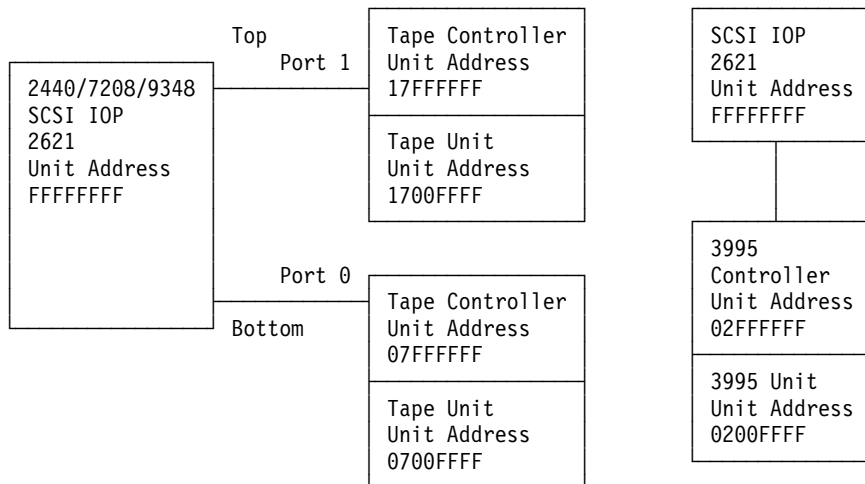
SCSI I/O Processor (Type 2621) Addressing Scheme: The type 2621 SCSI I/O processor provides support for the following:

- 2440 Tape Unit
- 3995 AS/400 Optical Library Dataserver
- 636x Tape Units in the FC 5032 Removable Storage Unit
- 7208 Tape Drive
- 9348 Tape Unit

- 9427 8-mm Tape Library

The SCSI I/O processor maps the unit addresses as follows:

SCSI I/O Processor Unit Address Assignments:



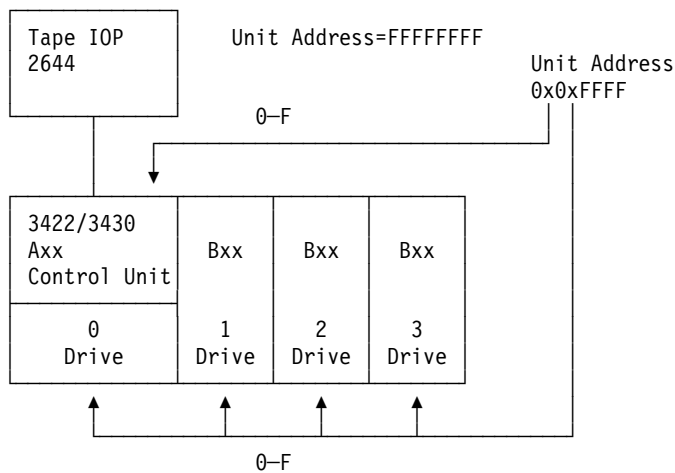
Tape I/O Processor (Type 2644) Addressing Scheme: The tape I/O processor (type 2644) provides support for the 3422, 3430, 3480, and 3490 Tape Units. The second character of the unit address is the control unit number and the fourth character is the drive address.

Note: There must *not* be a tape unit installed with address 0.

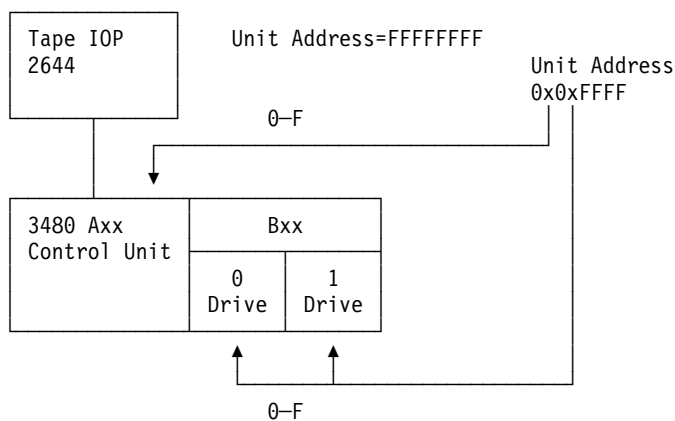
Assume that you have a tape I/O processor with one 3430 Tape Unit; the tape I/O processor maps the unit addresses as follows: 3430 control unit UA=00FFFFFF, 3430 device 1 UA=0000FFFF, 3430 device 2 UA=0001FFFF, 3430 device 3 UA=0002FFFF, and 3430 device 4 UA=0003FFFF.

Tape I/O Processor (Type 2644) Unit Address Assignments:

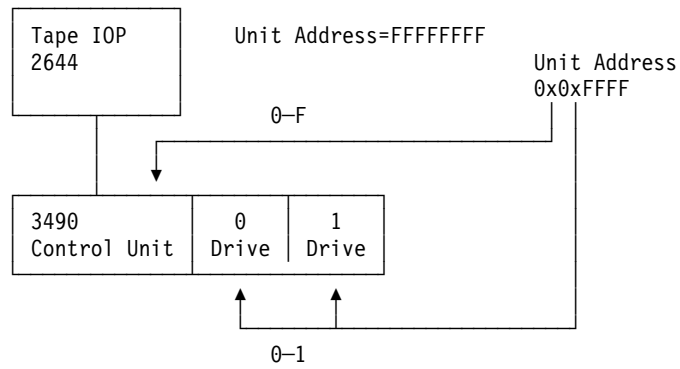
3422/3430 Tape Drives:



3480 Tape Drive:



3490 Tape Drive:



Type 2718 IOA, 2729 IOA, and 6534 IOP Addressing:

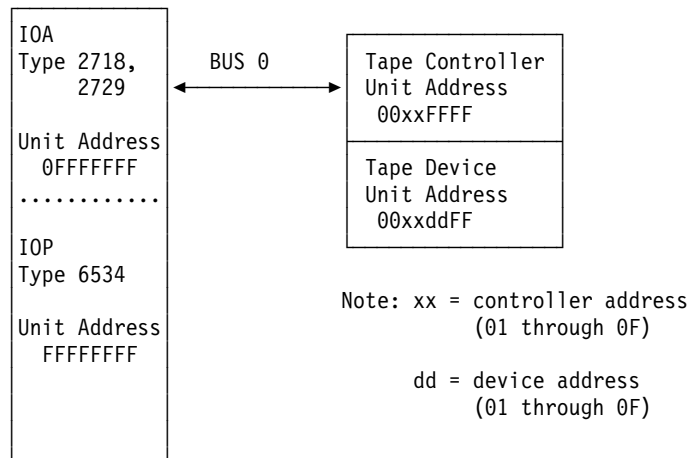


Figure 69. 2718 IOA, 2729 IOA, and 6534 IOP to tape unit

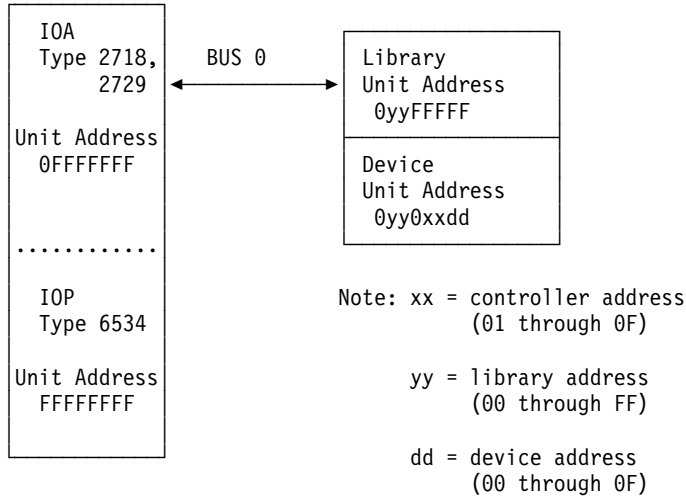


Figure 70. 2718 IOA, 2729 IOA, and 6534 IOP to tape or optical library

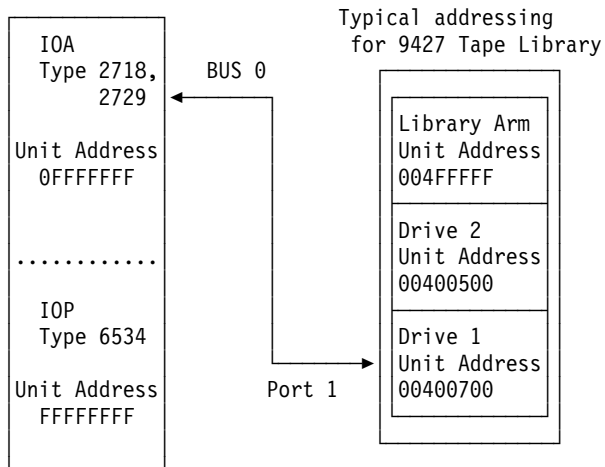


Figure 71. Typical addressing

Type 6501 IOP Addressing:

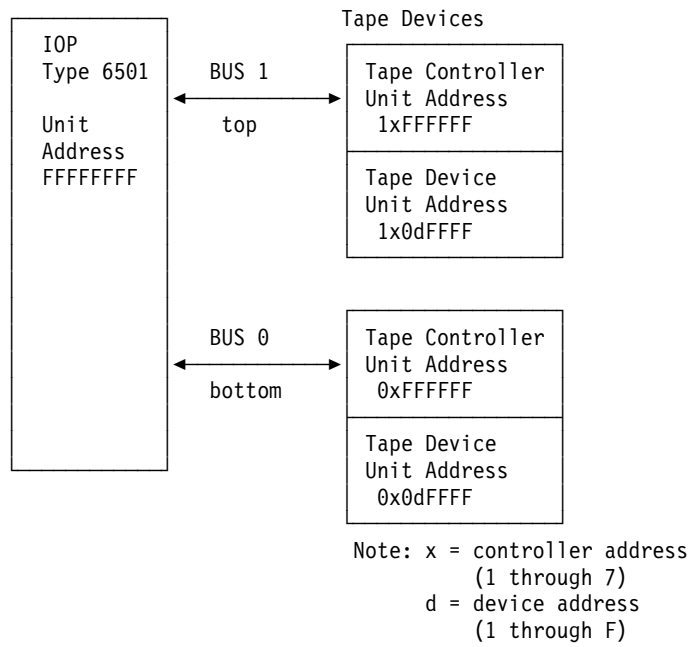


Figure 72. 6501 IOP to tape units

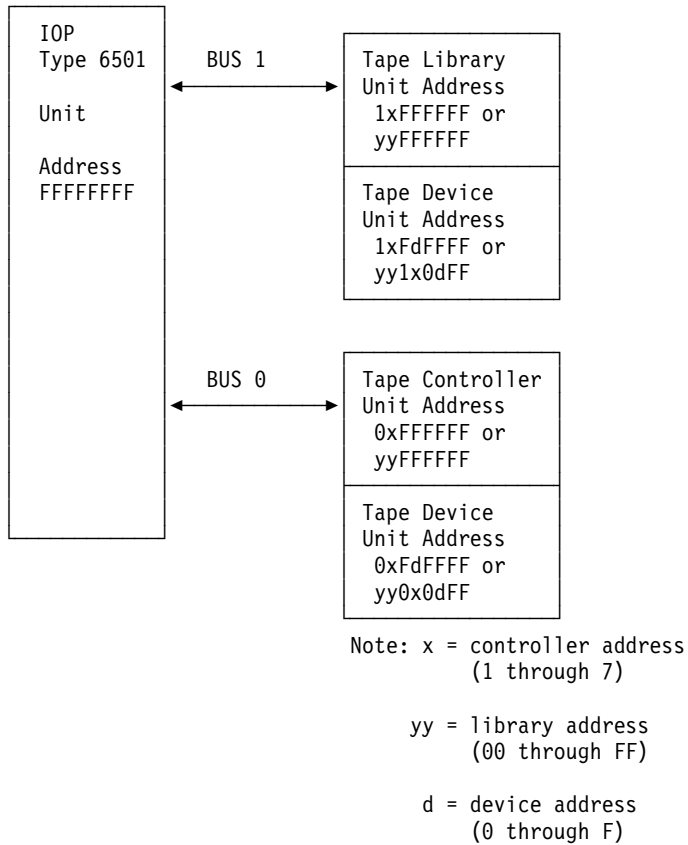


Figure 73. 6501 IOP to tape library

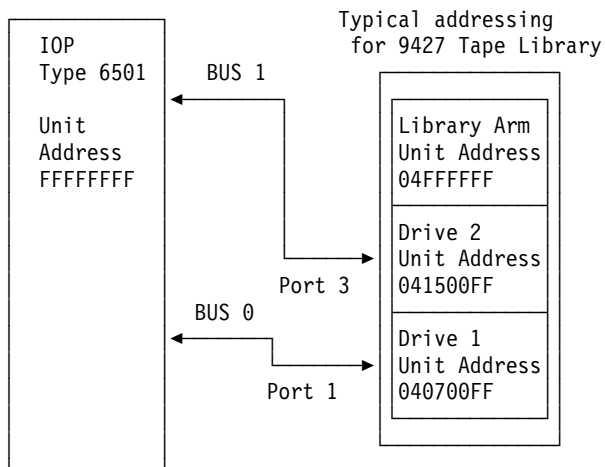


Figure 74. Typical addressing

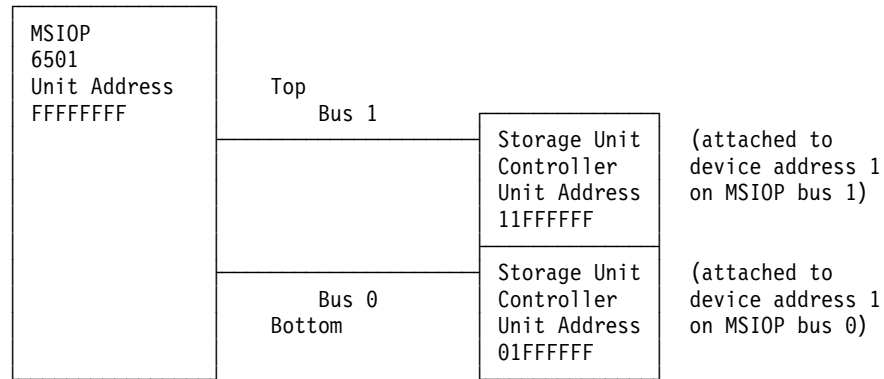


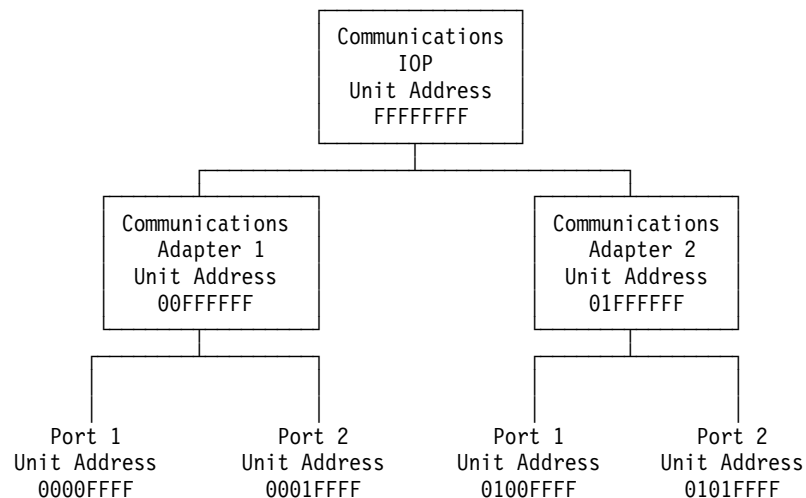
Figure 75. 6501 IOP to storage units

I/O Bus Addressing Schemes

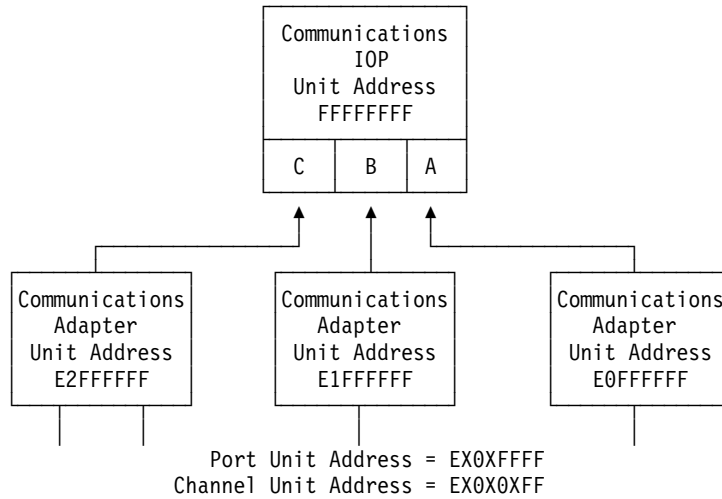
The unique schemes for each subsystem are described on the following pages.

Communications I/O Processor Unit Addressing Scheme: This example, for an SRC that is displayed on the control panel, shows a communications I/O processor with two I/O adapters and two ports.

When the system indicates the I/O processor, the 4 bytes of unit address (UA) for the I/O processor contain hex FFFFFFFF (the unit address points back to the I/O processor). For an I/O adapter, the first byte of the unit address is the I/O adapter number-1, the second through fourth, hex FFFFFF. For a port, the first byte is the I/O adapter number-1, the second byte is the port number-1 and the third and fourth, hex FFFF. For example, in the following hardware configuration, the communications I/O processor maps the unit addresses as follows:

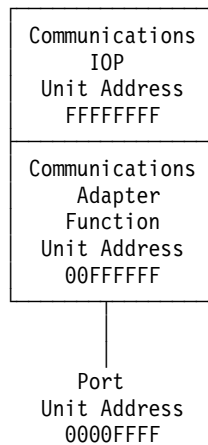


In the following example for an SRC that is displayed on the control panel, port 2 on the communications adapter would map its unit address as E201FFFF. The fourth channel from the communications adapter would map its unit address as E1004FF.

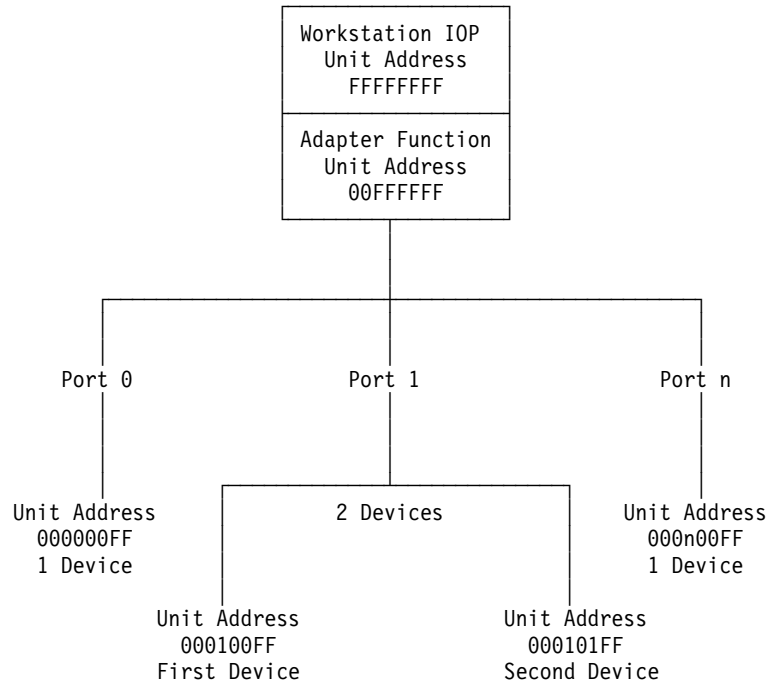


Assignments for Local Area Networks

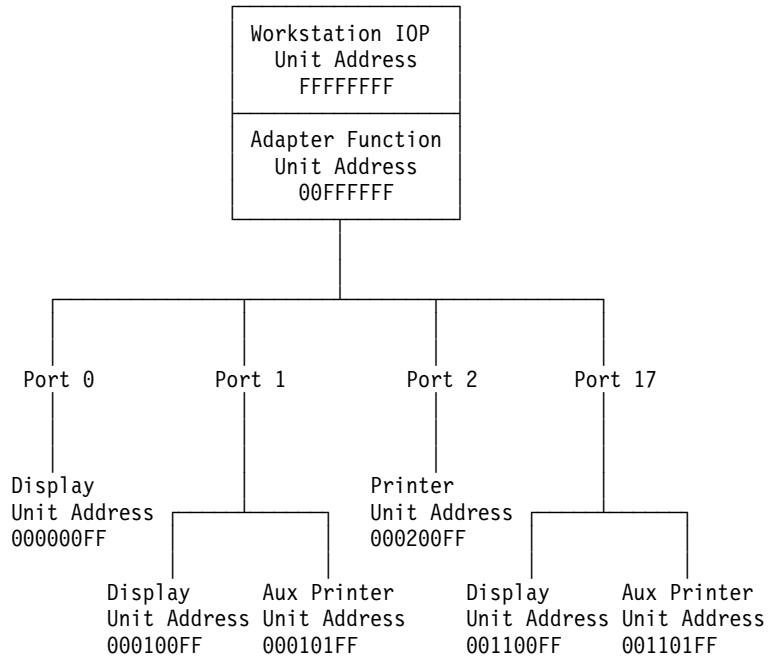
Local Area Networks



Twinaxial Workstation I/O Processor Unit Addressing Scheme: The example for a twinaxial workstation I/O processor SRC displayed on the control panel is described below. When the system indicates the I/O processor, the 4 bytes of unit address for the I/O processor always contain hex 00FFFFFF. The workstation I/O processor knows a device by its port and station address. So for a device, the first byte of the unit address is hex 00. The second byte is the port number (from 0 to 7). The third byte is the station address (from 0 to 6). The fourth byte is hex FF.



ASCII Workstation I/O Processor Unit Addressing Scheme: The example for an ASCII workstation I/O processor SRC that is displayed on the control panel is described below. When the system indicates the I/O processor, the 4 bytes of unit address for the I/O processor always contain hex 00FFFFFF. The workstation I/O processor knows a device by its port and station address. So, for a device, the first byte of the unit address is hex 00. The second byte is the port number (from 00 to 11). The third byte is the station address (from 00 to 01). The fourth byte is hex FF. The primary device always has a station address of 00. It may be a display or a printer (if attached through a modem, the primary device can only be a display). Each port may have an auxiliary printer attached if the primary is a display, and its station address is always 01. The ASCII workstation I/O processor maps the unit addresses as follows:



Optical Link Addressing Information

FC 503x Optical Bus Cable Layout and Local SPD Optical Bus Driver Card Positions

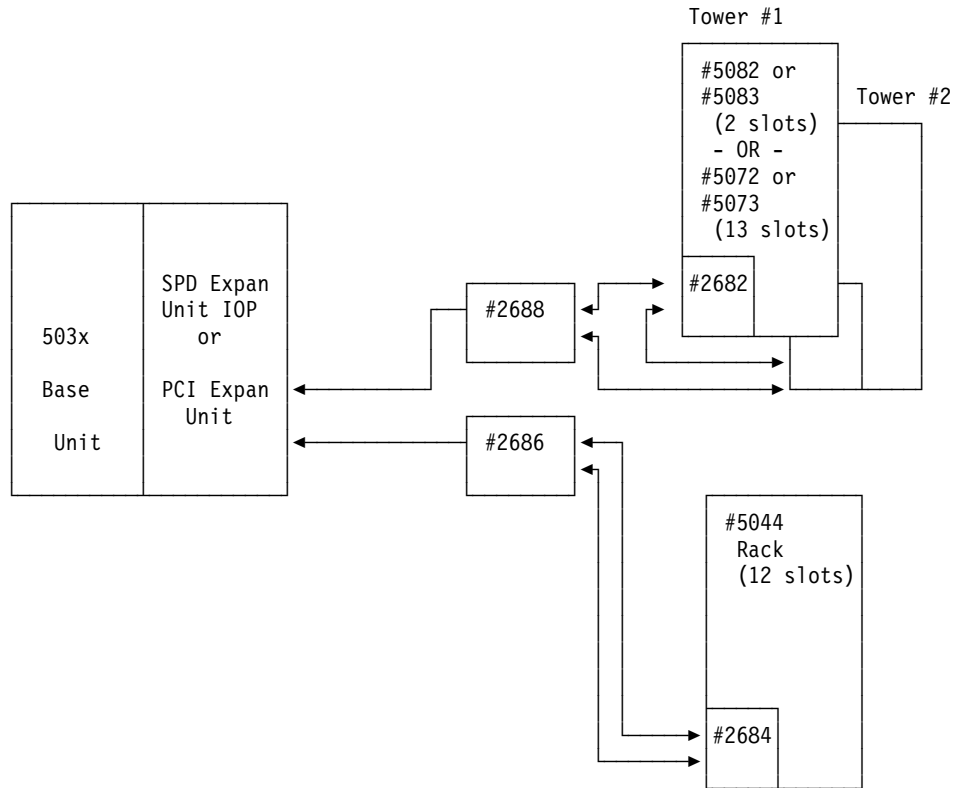


Figure 76. Optical Bus Cable Layout for Model 503x migrated towers

You can attach two of any combination of 2686 and 2688 to the Model 503x migrated tower. This allows up to four units or two racks, or any combination thereof, to attach to each expansion unit.

SPD Expansion Unit

PCI Expansion Unit

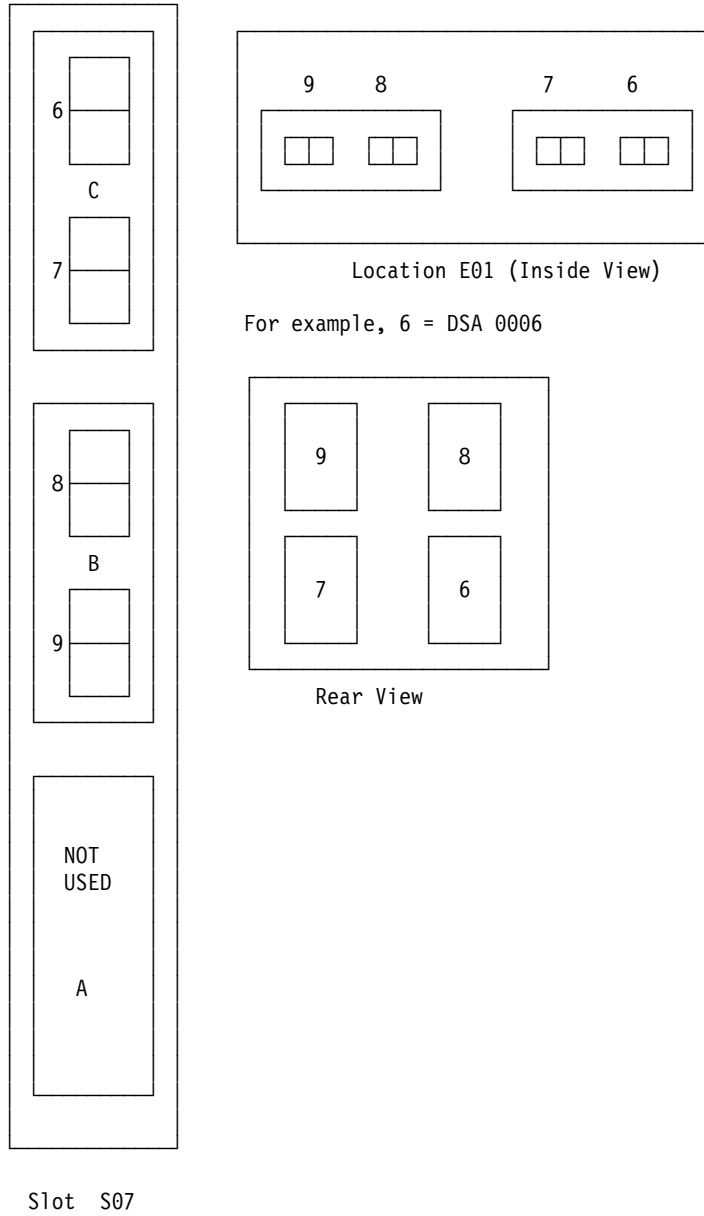


Figure 77. SPD Optical Bus Driver Card Locations

FC 5077 Optical Bus Cable Layout and Local SPD Optical Bus Driver Card Positions

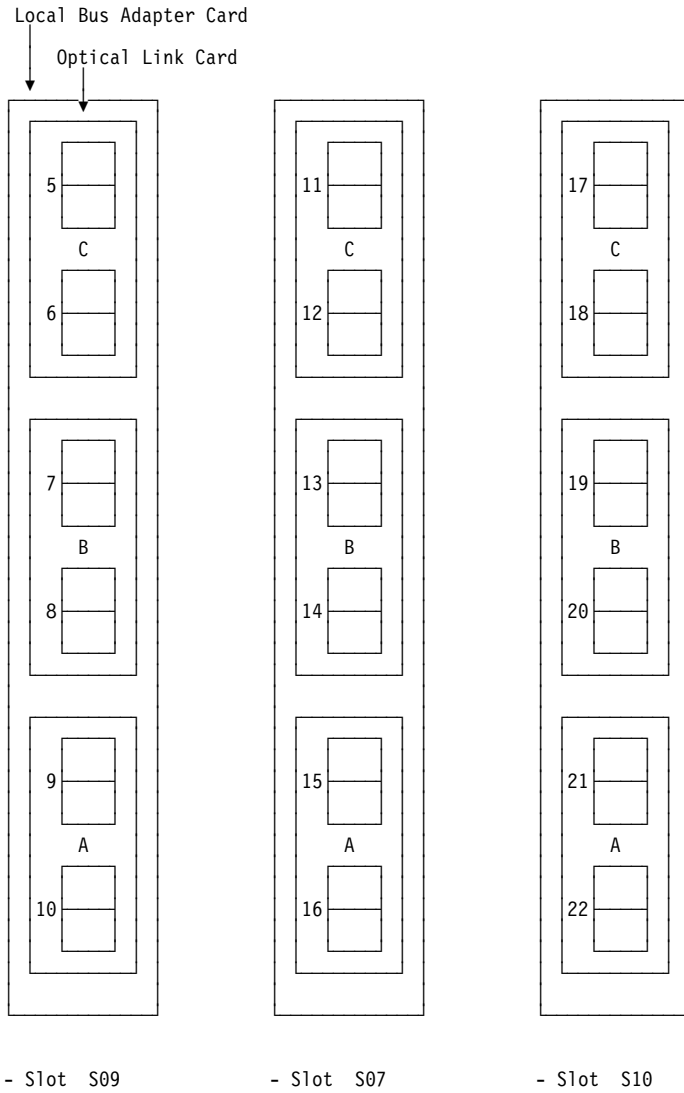


Figure 78. SPD Optical Bus Driver Card

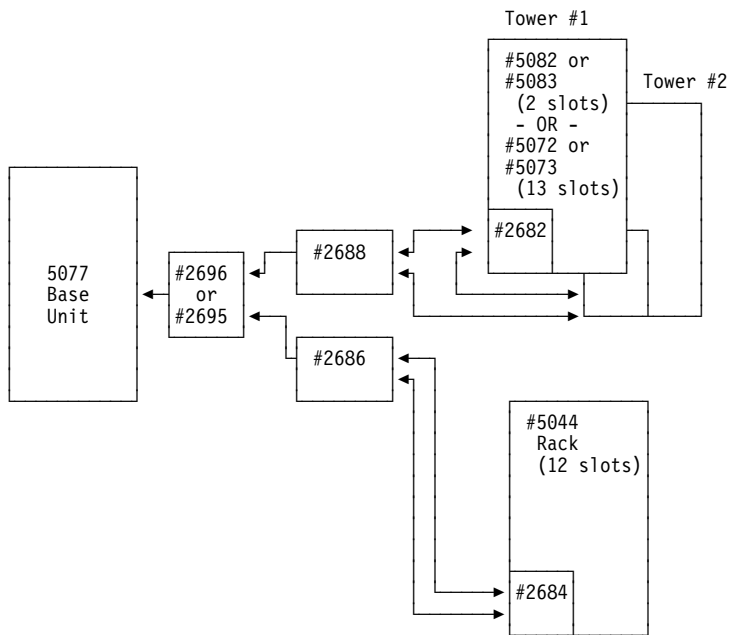


Figure 79. FC 5077 Optical Bus Cable Layout

You can attach three of 2686 and 2688, in any combination, to a single 2696 or 2695 card. This allows up to six towers or three racks, or any combination thereof, to attach to each 2696 or 2695 card.

Tape and Optical Unit Address Jumpers

Only locations D01 and D02 on FC 5033 require address jumpers. All other locations automatically address the tape or optical unit when installed into the backplane.

Optical Unit

You can not install the optical unit in location D01.

Location D02

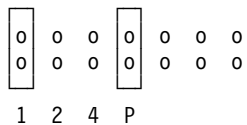


Figure 80. Optical Unit jumpers for location D02

Note: The optical unit uses jumper part number 1675209.

6383, 6385, 6386 Tape Unit

You do not need to install jumpers with the tape unit in location D01.

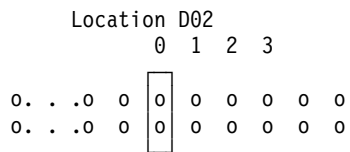


Figure 81. 6383, 6385, 6386 tape unit address jumpers for location D02

Note: The 6383, 6385, and 6386 tape units use jumper part number 61X7052.

6379, 6380, 6381, 6382 Tape Unit

You do not need to install jumpers with the tape unit in location D01.

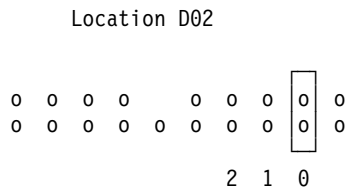


Figure 82. 6379, 6380, 6381, 6382 tape unit address jumpers for location D02

Note: The 6379, 6380, 6381 and 6382 tape units use jumper part number 1675209.

6390 Tape Unit

You do not need to install jumpers with the tape unit in location D01.

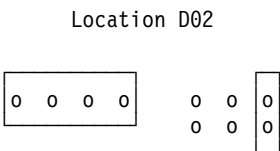


Figure 83. 6390 tape unit address jumpers for location D02

Note: The 6390 tape unit uses jumper part number 1675209.

6335 Tape Unit

You do not need to install jumpers with the tape unit in location D01.

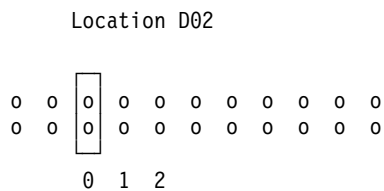


Figure 84. 6335 tape unit address jumpers for location D02

Note: The 6335 tape unit uses jumper part number 1675209.

Type, Model, Part Number List

Type, Model, and Part Number List

Table 36. Type, Model, and Part Number List

Type	Description	Expansion Tower Feature Code	Part Number
2440	Magnetic Tape Unit See <i>2440 Magnetic Tape Subsystem Service Guide</i>	503x, 5077	
2605	ISDN Basic IOA	5034, 5035, 5077	17G2570
2609	2-line EIA-232/V.24 Communications IOA	5034, 5035, 5077	21F4867
2610	2-line X.21 Communications IOA	5034, 5035, 5077	21F4868
2612	EIA-232/V.24 Communications IOA	5034, 5035, 5077	86G8117
2613	V.35 Communications IOA	5034, 5035, 5077	44H6464
2614	X.21 Communications IOA	5034, 5035, 5077	86G8369
2617	Ethernet IOA	5034, 5035, 5077	85F9107
2618	Distributed Data Interface IOP	5034, 5035, 5077	85F8977
2619	Token-Ring Network IOP	5034, 5035, 5077	91H0010
2620	Cryptographic IOP	5034, 5035, 5077	99G9709
2621	SCSI IOP	All	86G8303
2623	Multiline Communications IOP	5034, 5035, 5077	85F7223
2624	Magnetic Storage IOP	All	86G8317
2626	Token-Ring Network IOA	5034, 5035, 5077	85F9033
2628	Cryptographic IOP	5034, 5035, 5077	99G9714
2629	Communications IOP	5034, 5035, 5077	91H0465
2644	Tape IOP	5034, 5035, 5077	21F6085
2663	I/O Attachment Processor	5034, 5035, 5077	21H9149
2664	Integrated Fax IOP (not United Kingdom)	5034, 5035, 5077	85F9099
2664	Integrated Fax IOP (United Kingdom)	5034, 5035, 5077	75G3874
2665	Distributed Data Interface IOP	5034, 5035, 5077	17G2919
2666	High Speed Communications IOP	5034, 5035, 5077	8193663
2668	Wireless LAN IOA Australia US and Canada Spain France Japan European Telecommunications and Standards Institute (ETSI)	5034, 5035, 5077	75G3949 75G6041 75G3911 75G3911 75G3950 75G3906 or 75G3905
2680	SPD Optical Bus Receiver Card (266 MBPS receiver)	5034, 5035, 5077	90H9443
2682	SPD Optical Bus Receiver Card (1063 MBPS receiver)	5034, 5035, 5077	21H6573
2684	SPD Optical Bus Receiver Card (266 MBPS receiver)	5034, 5035, 5077	16G5837
2685	SPD Optical Bus Receiver Card (1063 MBPS receiver)	5034, 5035, 5077	21H6579
2686	SPD Optical Bus Driver Card (266 MBPS)	5034, 5035, 5077	87G5316
2688	SPD Optical Bus Driver Card (1063 MBPS)	5034, 5035, 5077	87G5560

Type, Model, Part Number List

Table 36. Type, Model, and Part Number List (continued)

Type	Description	Expansion Tower Feature Code	Part Number
2690	I/O Bus Adapter	5077	6475987
2695	Local Bus Adapter Card	5077	87G5400
2696	Local Bus Adapter Card	5077	21H6529
2699	Multiline Communications IOA	5034, 5035, 5077	21H5412
2713	SPD I/O Regulator	5077	21H4829
2718	Storage IOA (external removable media)	503x, 5077	91H3974
2720	Twinaxial Workstation and Communications IOA	503x	90H9192
2721	Multiline Communications IOA	503x	21H5388
2722	Twinaxial Workstation IOA	503x	21H5394
2723	Ethernet IOA	503x, 5077	21H9201
2724	Token Ring IOA	503x, 5077	44H7571
2726	Storage IOA	503x, 5077	44H6303
2728	Storage IOA	503x, 5077	21H9207
2729	Storage IOA (external media)	503x, 5077	21H9249
272A	SI Interposer	5077	21H7623
272C	HSL Interposer Card	5077	04N6922
2735	Local Bus Adapter Card	5034, 5035	44H7791
2740	Storage IOA Card Card Cache Battery Pack Cache Battery Pack	503x, 5077	44H6442 (Non-Japan) 23L2845 (Japan) 44L0305 (Non-Japan) 44L0304 (Japan)
2741	Storage IOA	503x, 5077	91H0271
2743	Gigabit Ethernet IOA		41L6396
2744	100 Mbps Token Ring IOA		23L4288
2745	Multiline Communicatons IOA	503x	21H5490
2746	Twinaxial IOA	503x, 5077	21H5497
2748	Storage IOA Card Card Cache Battery Pack Cache Battery Pack Mode Jumper	503x, 5077	91H3987 (Non-Japan) 23L2841 (Japan) 44L0302 (Non-Japan) 44L0301 (Japan) 23L3442
2750	ISDN Communications adapter	503x, 5077	97H7674
2751	ISDN Communications IOA	503x, 5077	97H7675
2761	Integrated modem IOA	503x, 5077	

Type, Model, Part Number List

Table 36. Type, Model, and Part Number List (continued)

Type	Description	Expansion Tower Feature Code	Part Number
	United States		97H7678
	Europe		97H7679
	Germany		97H7680
	Australia		97H7681
	Spain		97H7682
	Czechoslovakia		97H7683
2809	Combined Function IOP	503x, 5077	21H5312
2810	High speed communications IOP	5034, 5035, 5077	91H0461
2811	ATM 25 Mb/sec IOA	503x, 5077	21H7976
2812	ATM 45 Mb/sec IOA	503x, 5077	21H7979
2815	ATM 155 Mb/sec IOA	503x, 5077	21H7977
2816	ATM 155 Mb/sec IOA	503x, 5077	21H7909
2818	ATM 155 Mb/sec IOA	503x, 5077	21H7975
2819	ATM 34 Mb/sec IOA	503x, 5077	91H4002
2824	Combined Function IOP	503x, 5077	91H4023
2826	Local Bus Adapter Card	5034, 5035,	45H1235
282C	Tower Card (with CFIOP)	503x	87G0769
2838	Ethernet 100 Mb/sec IOA	503x, 5077	21H5460
283C	Device Backplane (DB3)	FC 5074, 5079	04N4723
283D	Device Backplane (DB1 & DB2)	FC 5074, 5079	04N6601
2850	Integrated Netfinity Server for AS/400 Model 001 Model 002 Model 011 Model 012	503x	61H0115 61H0116 61H0127 23L4210
285A	Bridge Card (PCI to PCI) Model 001 Model 002 Model 003	503x	90H8952 90H8994 90H9212
285B	SPCN Card	5077	21H6961
2860	16MB Integrated Netfinity Server for AS/400 memory module	503x	44H7556
2861	32MB Integrated Netfinity Server for AS/400 memory module	503x, 5077	44H7558
2862	128MB Integrated Netfinity Server for AS/400 memory module	503x, 5077	90H9075
2867	256MB Integrated Netfinity Server for AS/400 memory module	503x, 5077	97H7725
28AC	PCI Drawer	5065, 5066	24L0291
3422	Magnetic Tape Unit See 3422 <i>Magnetic Tape Subsystem Maintenance Information</i>	503x, 5077	

Type, Model, Part Number List

Table 36. Type, Model, and Part Number List (continued)

Type	Description	Expansion Tower Feature Code	Part Number
3430	Magnetic Tape Unit See 3430 <i>Magnetic Tape Subsystem Maintenance Information</i>	503x, 5077	
3480	Magnetic Tape Unit See 3480 <i>Magnetic Tape Subsystem Maintenance Information</i>	503x, 5077	
3490	Magnetic Tape Unit See 3490 <i>Magnetic Tape Subsystem Maintenance Information</i>	503x, 5077	
3490E	Magnetic Tape Unit See 3490 <i>Magnetic Tape Subsystem Maintenance Information</i>	503x, 5077	
3494	Magnetic Tape Library See 3494 <i>Magnetic Tape Library Maintenance Information</i>	503x, 5077	
3570	Magnetic Tape Unit See 3570 <i>Magnetic Tape Subsystem Maintenance Information</i>	503x, 5077	
3590	Magnetic Tape Unit See 3590 <i>Magnetic Tape Subsystem Maintenance Information</i>	503x, 5077	
3995	AS/400 Optical Library Dataserver See 3995 <i>Optical Library Dataserver Maintenance Information Manual</i>	503x, 5077	
4010	2726/2741 Storage IOA Cache Adapter	503x, 5077	44H6330
4700	6512/6532/6533/671A IOP Cache Adapter	503x, 5077	86G8149
4758	PCI Cryptographic Coprocessor-Battery Kit	All	09J8199 (need to order 2 kits)
4758-023	PCI Cryptographic Coprocessor	All	10J0593
6050	Twinaxial Workstation IOP	5034, 5035, 5077	75G3719
6112	Magnetic Storage IOP	All	85F9041
6140	Twinaxial Workstation IOP	5034, 5035, 5077	21F1888
6141	ASCII Workstation IOP	5034, 5035, 5077	73F9267
6142	ASCII 12-Port Workstation Attachment 3-meter 6-meter	5034, 5035, 5077	59X3816 59X3829
6146	Diskette IOA	5034, 5035, 5077	46G0235
6147	Diskette IOA	5077	86G8103
6149	Token Ring Communications IOA	503x, 5077	99G9897
6153	V.35 Communications IOA	5034, 5035, 5077	17G2940
6180	Twinaxial Workstation IOA	5034, 5035, 5077	21H5406
6181	Ethernet Communications IOA	503x, 5077	91H0435
6321	CD-ROM CD-ROM	503x, 5077 5065 or 5066	93H8055 97H7330
6330	DVD	All	04N5272
6335	1/4-inch Magnetic Tape Unit • Tray with regulator	5077	86G7803
6368	1/4-inch Magnetic Tape Unit (blue eject button; QIC-1000 on tape unit door)	5077	17G2504
6369	1/4-inch Magnetic Tape Unit (blue eject button; QIC-2GB on tape unit door)	5077	8191923

Type, Model, Part Number List

Table 36. Type, Model, and Part Number List (continued)

Type	Description	Expansion Tower Feature Code	Part Number
6378	1/4-inch Magnetic Tape Unit • Tray with regulator	5077	46G3738
6379	1/4-inch Magnetic Tape Unit, QIC 1000 Tape Unit Tape Unit Holder — models 620, S20, and 720 only	503x, 5077	16G8491 44H9007
6380	1/4-inch Magnetic Tape Unit, QIC 2GB Tape Unit Tape Unit Holder — models 620, S20, and 720 only	503x, 5077	16G8571 44H9007
6381	Internal 1/4 inch cartridge drive with QIC-2GB (DC) on the door.	<ul style="list-style-type: none"> • FC 5072, 5073, 5077 expansion towers • All other towers 	<ul style="list-style-type: none"> • 21H7658 • 59H2742
6382	Internal 1/4 inch cartridge drive with QIC-4GB (DC) on the door.	<ul style="list-style-type: none"> • FC 5072, 5073, 5077 expansion towers • FC 5065, 5066, 5074, 5079 expansion towers • All other towers 	<ul style="list-style-type: none"> • 21H7019 • 97H7331 • 59H3745
6383	Internal 1/4 Inch cartridge drive with MLR1-S on the front cover	<ul style="list-style-type: none"> • FC 5072, 5073, 5077 expansion towers • FC 5065, 5066, 5074, 5079 expansion towers • All other towers 	<ul style="list-style-type: none"> • 97H7717 • 24L1064 • 59H4533
6385	1/4-inch Magnetic Tape Unit, QIC 5010 Tape Unit Tape Unit Holder — models 620, S20, and 720 only	503x, 5077	59H4533 44H9008
6386	Internal 1/4 inch cartridge drive with MLR3 on the front cover.	<ul style="list-style-type: none"> • FC 5072, 5073, 5077 expansion towers • FC 5065, 5066, 5074, 5079 expansion towers • All other towers 	<ul style="list-style-type: none"> • 97H7528 • 24L1065 • 59H4130
6390	8-mm Magnetic Tape Drive, FMT7GB Tape Unit Tape Unit Holder — models 620, S20, and 720 only	503x, 5077	16G8566 44H9009

Table 36. Type, Model, and Part Number List (continued)

Type	Description	Expansion Tower Feature Code	Part Number
63A0	Magnetic Tape Unit; see "FI00871" on page 554 to determine type.	503x	Use the device type to determine the part
6500	Magnetic Storage IOP	All	85F8909
6501	Magnetic Storage IOP	All	85F8935
6502	Magnetic Storage IOP	All	17G2900
6503	6502 IOP Cache Adapter	5034, 5035, 5077	85F7214
6506	File Server IOP	5034, 5035, 5077	21H3909
6507	SCSI Adapter Card	503x	90H9062
6509	File Server Storage Expansion	5034, 5035, 5077	75G8362
6510	File Server IOA	5034, 5035, 5077	8193654
6512	Magnetic Storage IOP	All	99G9473
6513	Tape IOP	All	17G1325
6520	File Server IOA	5034, 5035, 5077	8193655
6530	Magnetic Storage IOP	All	46G3299
6532	Magnetic Storage IOP	5034, 5035, 5077	91H0485
6533	Magnetic Storage IOP	503x, 5077	21H9060
6534	Magnetic Media IOP	5034, 5035, 5077	91H0470
6600	Disk unit		
6602	See "Disk Unit Type, Model, and Part Number List" on page 756.		
6603			
6605			
6606			
6607			
6616	Integrated Netfinity Server for AS/400 (IOP)	5034, 5035, 5077	91H0353
6617	Integrated Netfinity Server for AS/400 (IOP) Model 011 (200mhz) Model 012 (333mhz)	5034, 5035, 5077	97H7627 23L4205
6713	Disk unit. See "Disk Unit Type, Model, and Part Number List" on page 756.		
6714	Disk unit. See "Disk Unit Type, Model, and Part Number List" on page 756.		
6716	Disk unit. See "Disk Unit Type, Model, and Part Number List" on page 756.		
6717	Disk unit. See "Disk Unit Type, Model, and Part Number List" on page 756.		
671A	CFIOP	5077	91H4086
6731	Disk unit. See "Disk Unit Type, Model, and Part Number List" on page 756.		

Type, Model, Part Number List

Table 36. Type, Model, and Part Number List (continued)

Type	Description	Expansion Tower Feature Code	Part Number
7207	External 1/4-inch Cartridge Drive with QIC-4GB-DC on the door	503x, 5077	59H4434
7208	8-mm Magnetic Tape Drive See 7208 <i>Tape Drive Service Guide</i>	503x, 5077	
9331	Diskette Unit See 9331 <i>Diskette Unit Service Information</i>	503x, 5077	
9347	Magnetic Tape Unit See 9347 <i>Tape Unit Service Guide</i>	503x, 5077	
9348	Magnetic Tape Unit See 9348 <i>Tape Unit Service Information</i>	503x, 5077	
9427	8-mm Tape Cartridge Library See 9427 <i>8-mm Tape Cartridge Library Service Guide</i>	503x, 5077	
9429	Tape Cartridge Library See 9429 <i>Tape Cartridge Library Service Guide</i>	5077	

Disk Unit Type, Model, and Part Number List

Notes:

1. Disk unit part numbers 05G3988, 05G3989, and 05G3990 will be seen in multiple places within the following table, but with different level numbers. For disk units with these part numbers, the disk unit level can be found in the system information. It can also be found on the disk unit label following the FRU part number. For example, FRU P/N 05G3988-1 indicates a type 6605 disk unit with a level of 1.
2. When ordering a disk unit, use the part number that is followed by an asterisk (*) for your particular type and level. This ensures that you receive the correct replacement part if a substitute is sent in place of the original part number.
3. When exchanging a logic card, use the part number that is indicated for that type and level disk unit.
 - A logic card with a part number of 27H0253 or 27H1830 cannot be used again once it has been installed on a disk unit that was powered on. The logic card customizes itself to that disk unit and cannot be reset in the field. Do not attempt to remove a logic card from another disk unit with the same part number because it will not function for that reason.
 - Once a logic card has been installed on a failed disk unit for data recovery, the disk unit and logic card should be removed from the system and then returned. The recovered, or system, data should be restored to a new disk unit assembly.

Table 37. Disk Unit Type, Model, and Part Number List

Type	Description	System Unit Model	Part Number
6600	Disk Unit. Remove the disk unit from the tower to determine the part number of the failing item.		

Type, Model, Part Number List

Table 37. Disk Unit Type, Model, and Part Number List (continued)

Type	Description	System Unit Model	Part Number
6602	Disk Unit Level 0 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 1 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) 	All	Level 0 <ul style="list-style-type: none"> • 45G9470 • 45G9463 • 86G7766 • 44H8995 Level 1 <ul style="list-style-type: none"> • 45G9509 • 45G9501 • 86G7768 • 44H8974
6603	Disk Unit Level 0 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 1 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) 	All	Level 0 <ul style="list-style-type: none"> • 86F0110 • 86F0100 • 86G7762 • 44H8996 Level 1 <ul style="list-style-type: none"> • 86F0112 • 86F0103 • 86G7764 • 44H8998
6605	Disk Unit Level 1 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 4 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) 	All	Level 1 <ul style="list-style-type: none"> • 74G7014 • 74G6977* • 05G3988 • 86G7888 • 44H8999 Level 4 <ul style="list-style-type: none"> • 86G9130 • 86G9123* • 05G3988 • 86G7888 • 44H8999

Type, Model, Part Number List

Table 37. Disk Unit Type, Model, and Part Number List (continued)

Type	Description	System Unit Model	Part Number
6606	<p>Disk Unit Level 1</p> <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) <p>Disk Unit Level 3</p> <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) <p>Disk Unit Level 4</p> <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) <p>Disk Unit Level 5</p> <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) 	All	<p>Level 1</p> <ul style="list-style-type: none"> • 74G7014 • 74G6978* • 05G3989 • 86G7888 • 44H8999 <p>Level 3</p> <ul style="list-style-type: none"> • N/A • 74G8821* • 86G7888 • 44H8999 <p>Level 4</p> <ul style="list-style-type: none"> • 86G9130 • 86G9124* • 05G3989 • 86G7888 • 44H8999 <p>Level 5</p> <ul style="list-style-type: none"> • 27H0253 • 27H1712* • 86G7888 • 44H8999
6607	<p>For expansion towers, except FC 506x</p> <p>Disk Unit Level 1</p> <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) <p>Disk Unit Level 3</p> <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) <p>Disk Unit Level 4</p> <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) 	All	<p>Level 1</p> <ul style="list-style-type: none"> • 74G7014 • 74G6979* • 05G3990 • 86G7888 • 44H8999 <p>Level 3</p> <ul style="list-style-type: none"> • N/A • 74G8822* • 86G7888 • 44H8999 <p>Level 4</p> <ul style="list-style-type: none"> • 86G9130 • 86G9125* • 05G3990 • 86G7888 • 44H8999

Type, Model, Part Number List

Table 37. Disk Unit Type, Model, and Part Number List (continued)

Type	Description	System Unit Model	Part Number
	Disk Unit Level 5 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 6 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 7 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • (FC 503x) Disk Unit Level 8 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 9 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) For FC 506x (All Disk Drive Levels) <ul style="list-style-type: none"> • Disk Unit and Carrier 		Level 5 <ul style="list-style-type: none"> • 27H0253 • 27H1711* • 86G7888 • 44H8999 Level 6 <ul style="list-style-type: none"> • N/A • 59H6612 • 86G7888 • 44H8999 Level 7 <ul style="list-style-type: none"> • N/A • 74G8703 • 86G7888 • 44H8999 Level 8 <ul style="list-style-type: none"> • N/A • 59H7001* • 86G7888 • 44H8999 Level 9 <ul style="list-style-type: none"> • N/A • 25L3130 • 86G7888 • 44H8999 All Levels <ul style="list-style-type: none"> • 44L0061
6713	For expansion towers, except FC 506x Disk Unit Level 2 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 3 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 4 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) 	All	Level 2 <ul style="list-style-type: none"> • N/A • 74G8823* • 86G7888 • 44H8999 Level 3 <ul style="list-style-type: none"> • 27H1830 • 27H1710* • 86G7888 • 44H8999 Level 4 <ul style="list-style-type: none"> • N/A • 59H6611 • 86G7888 • 44H8999

Type, Model, Part Number List

Table 37. Disk Unit Type, Model, and Part Number List (continued)

Type	Description	System Unit Model	Part Number
	Disk Unit Level 5 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 6 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 9 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) For FC 506x (All Disk Drive Levels) <ul style="list-style-type: none"> • Disk Unit and Carrier 		Level 5 <ul style="list-style-type: none"> • N/A • 74G8704 • 86G7888 • 44H8999 Level 6 <ul style="list-style-type: none"> • N/A • 25L3131 • 86G7888 • 44H8999 Level 9 <ul style="list-style-type: none"> • N/A • 07N3681 • 86G7888 • 44H8999 All Levels <ul style="list-style-type: none"> • 44L0062
6714	For expansion towers, except FC 506x Disk Unit Level 1 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 2 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 3 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) For FC 506x (All Disk Drive Levels) <ul style="list-style-type: none"> • Disk Unit and Carrier 	All	Level 1 <ul style="list-style-type: none"> • N/A • 59H6613 • 86G7888 • 44H8999 Level 2 <ul style="list-style-type: none"> • N/A • 74G8705 • 86G7888 • 44H8999 Level 3 <ul style="list-style-type: none"> • N/A • 25L3132 • 86G7888 • 44H8999 All levels <ul style="list-style-type: none"> • 44L0063
6716	For expansion towers, except FC 506x Disk Unit Level 1 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) For FC 506x (All Disk Drive Levels) <ul style="list-style-type: none"> • Disk Unit and Carrier 	All	Level 1 <ul style="list-style-type: none"> • N/A • 07N3690 • 44H4637 • 44H4644 All levels <ul style="list-style-type: none"> • 04N2165
6717	For expansion towers, except FC 506x	All	

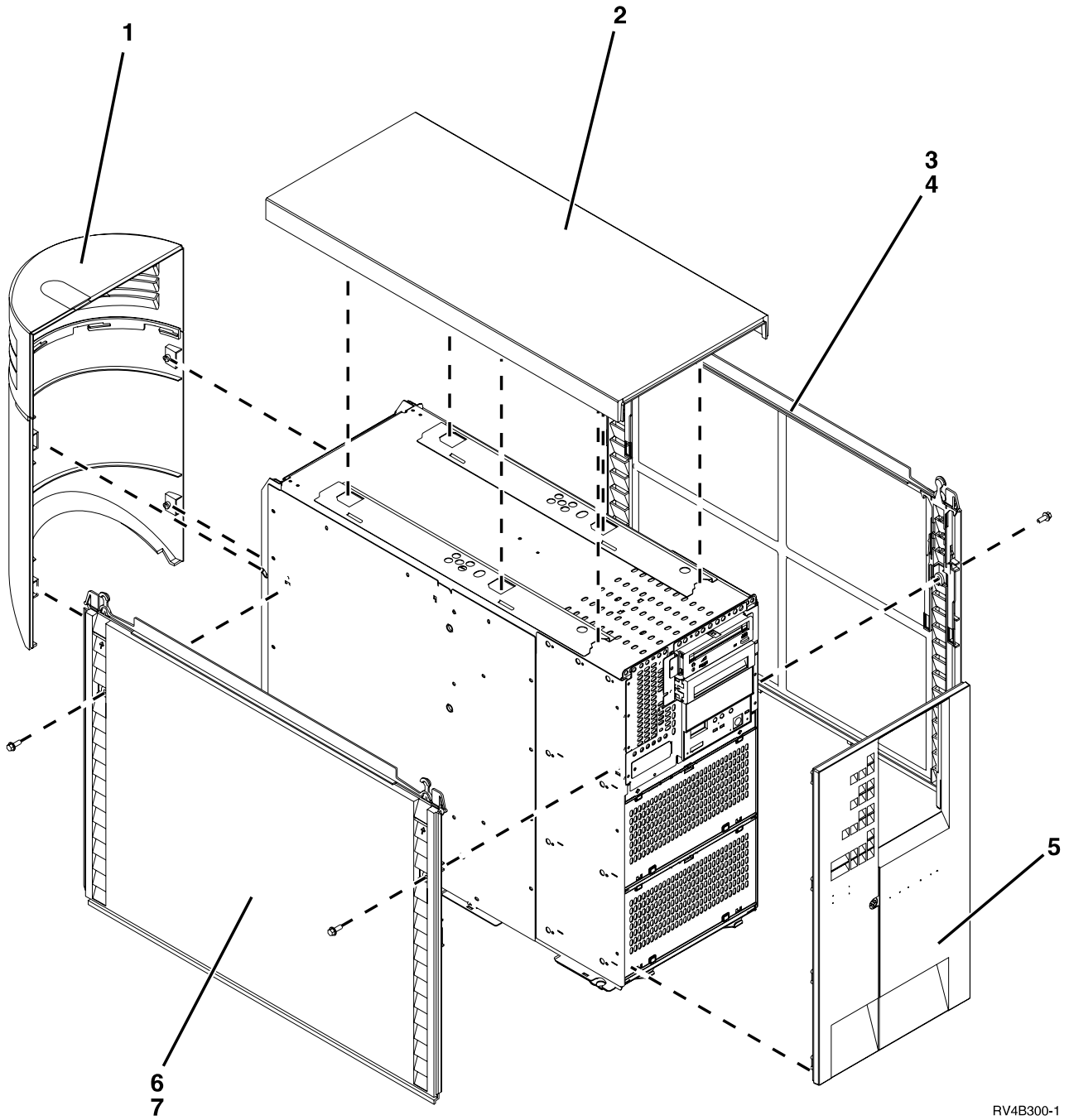
Table 37. Disk Unit Type, Model, and Part Number List (continued)

Type	Description	System Unit Model	Part Number
	Disk Unit Level 2 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 3 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 4 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) For FC 506x (All Disk Drive Levels) <ul style="list-style-type: none"> • Disk Unit and Carrier 		Level 2 <ul style="list-style-type: none"> • N/A • 34L2279 • 44H4637 • 44H4644 Level 3 <ul style="list-style-type: none"> • N/A • 09L4044 • 44H4637 • 44H4644 Level 4 <ul style="list-style-type: none"> • N/A • 07N3685 • 44H4637 • 44H4644 All Levels <ul style="list-style-type: none"> • 97H7332
6718	For expansion towers, except FC 506x Disk Unit Level 2 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) Disk Unit Level 3 <ul style="list-style-type: none"> • Disk Drive Logic Card • Disk Drive and Logic Card • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) For FC 506x (All Disk Drive Levels) <ul style="list-style-type: none"> • Disk Unit and Carrier 	All	Level 2 <ul style="list-style-type: none"> • N/A • 09L3932 • 44H4637 • 44H4644 Level 3 <ul style="list-style-type: none"> • N/A • 07N3686 • 44H4637 • 44H4644 All Levels <ul style="list-style-type: none"> • 40N2737
6731	For expansion towers, except FC 506x Read Cache Level 1 <ul style="list-style-type: none"> • Read Cache • Disk Unit Tray (FC 507x, FC 508x) • Disk Unit Holder (FC 503x) For FC 506x (All Disk Drive Levels) <ul style="list-style-type: none"> • Read Cache and Carrier 	All	Level 1 <ul style="list-style-type: none"> • 74G8715 • 44H4637 • 44H4644 All Levels <ul style="list-style-type: none"> • 24L1095

Parts Assemblies

FC 5033 Assemblies

Assembly 1: Cover Assemblies for FC 5033 expansion tower

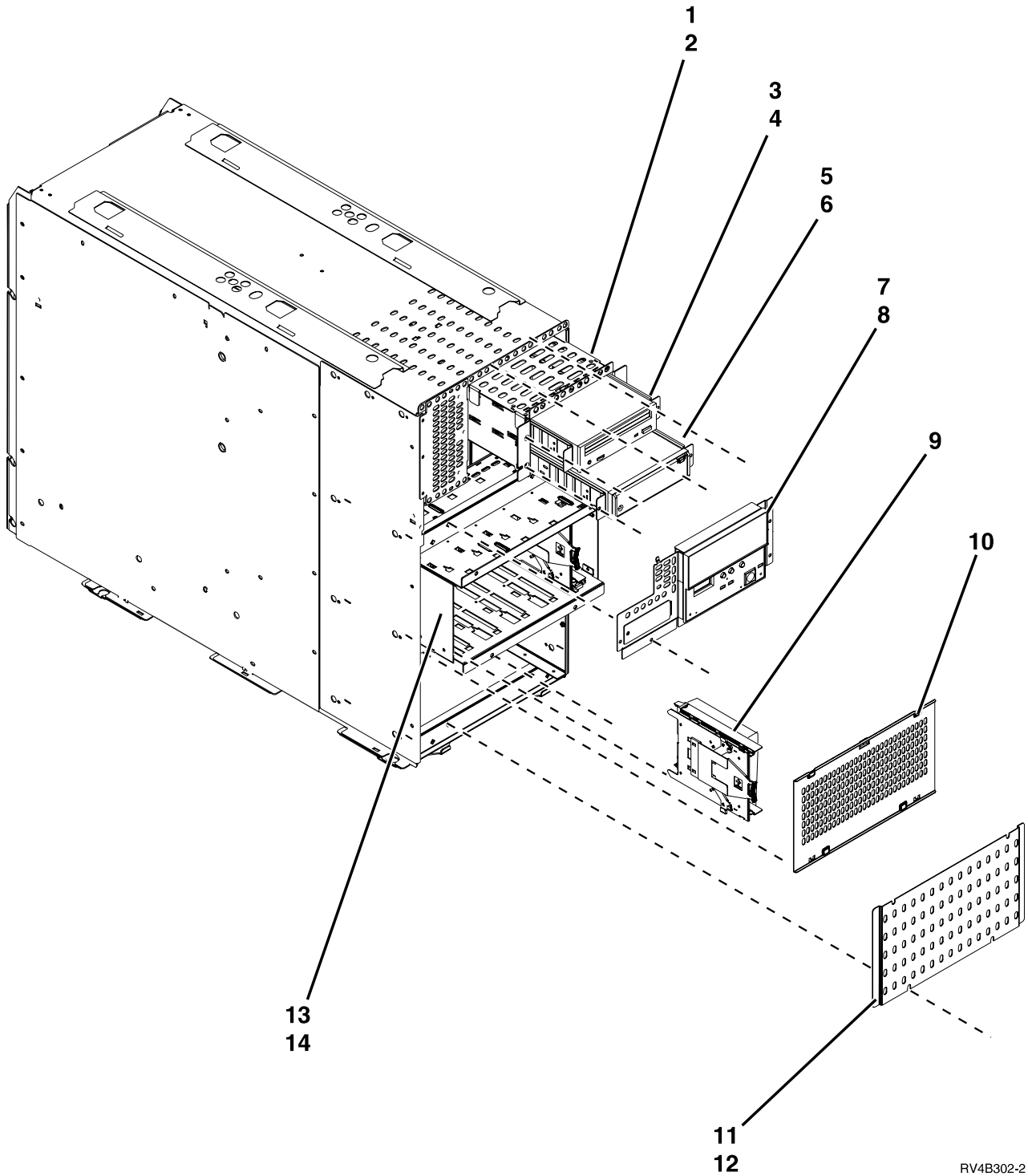


RV4B300-1

Assembly 1: (continued)

Asm- Index	Part Number	Units	Description
1-1	44H8040	1	Cover Asm, Rear (if migrated from model 600)
-1	44H8578	1	Cover Asm, Rear (if migrated from model S10)
-2	44H7742	1	Cover, Top
-3	44H7743	1	Cover, Side
-4	1621811	2	Screw
-5	44H7775	1	Cover Asm, Front (if migrated from model 600)
-5	90H6584	1	Cover Asm, Front (if migrated from model S10)
-6	44H7743	1	Cover, Side
-7	1621811	2	Screw

Assembly 2: Final Assemblies for FC 5033 expansion tower

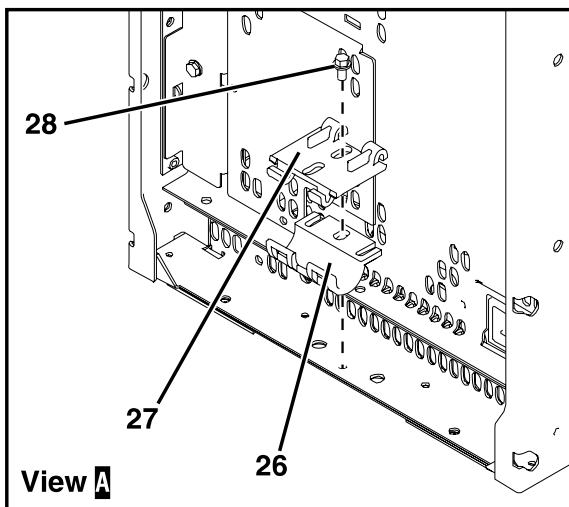
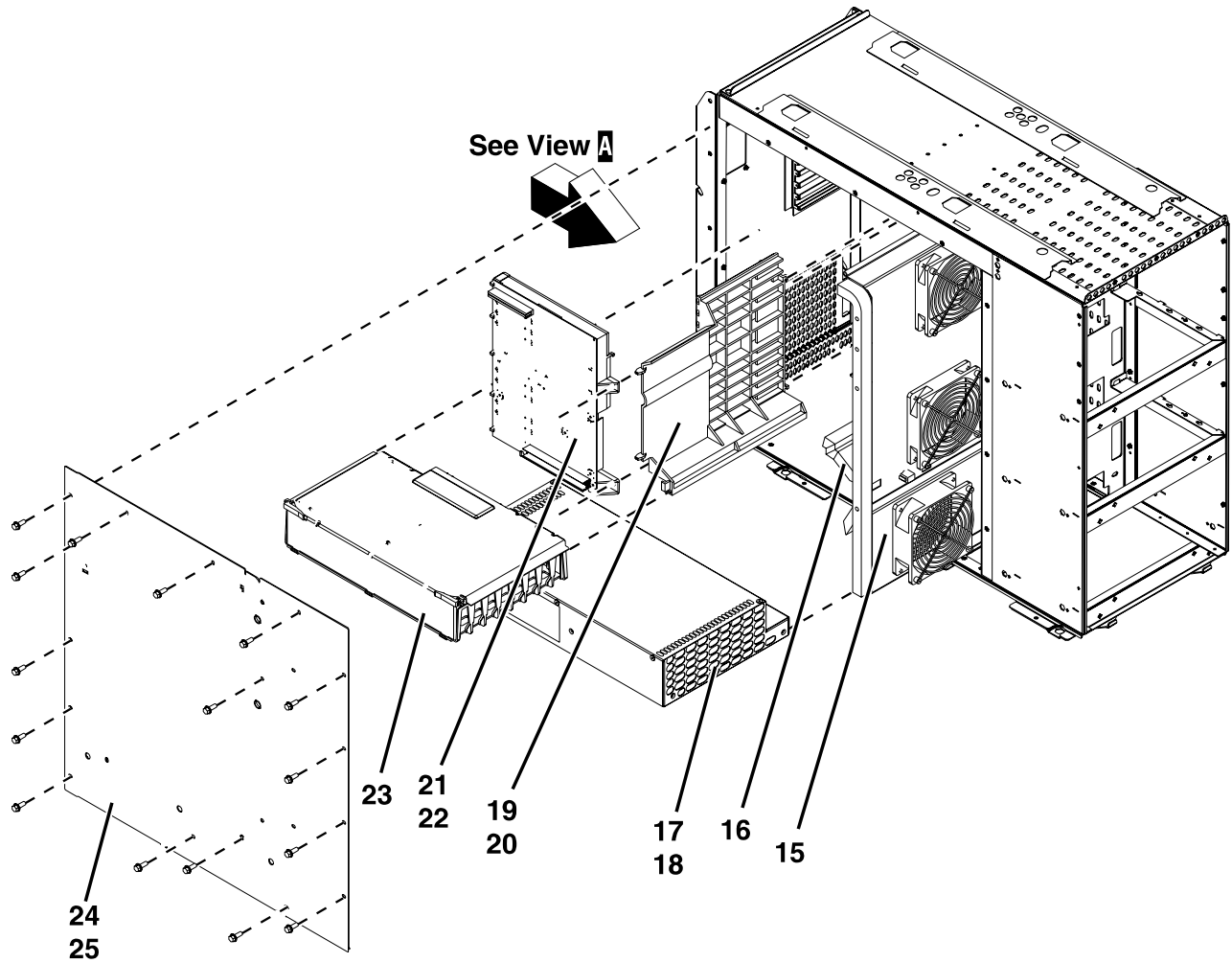


RV4B302-2

Assembly 2: (continued)

Asm- Index	Part Number	Units	Description
2-1	44H8295	1	Removable Media Frame Asm
-2	1621812	4	Screw
-3		1	Optical Storage Device See "Type, Model, and Part Number List" on page 750.
-4	44H8681	2	Screw
-	NONUM	1	Bracket Asm for Optical Device/Tape
-5	86G7623	1	Removable Media Filler Asm
-5		1	Removable Media See "Type, Model, and Part Number List" on page 750.
-6	44H8681	2	Screw
-	NONUM	1	Bracket Asm for Optical Device/Tape
-6	87G4617	2	Screw for Optical Device/Tape bracket asm.
-7	NONUM	1	Control Panel Asm
-8	1621812	5	Screw
-9		AR	Disk Unit/Holder Asm See "Disk Unit Type, Model, and Part Number List" on page 756.
-9	44H4636	AR	Connector Cover (when media is not installed)
-10	44H7997	1	Disk Unit EMC access plate
-11	44H7924	1	Disk Unit Blank Cover
-12	1621812	4	Screw
-13	91H3905	1	Disk Unit Frame Asm, Base
-13	91H3906	1	Disk Unit Frame Asm, Feature
-14	1621812	4	Screw

Assembly 2: (continued)

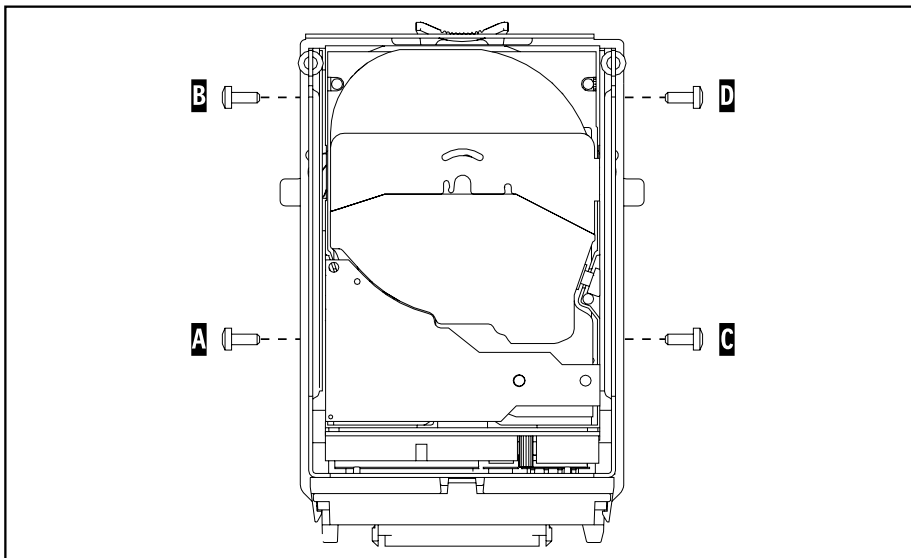
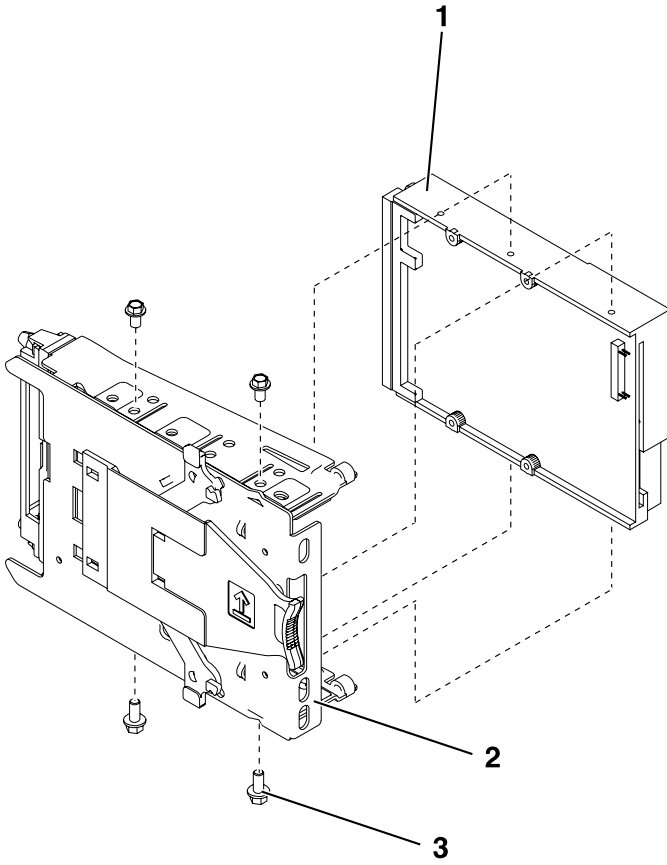


RV4B301-4

Assembly 2: (continued)

Asm- Index	Part Number	Units	Description
2-15	44H7756	1	AMDP Asm
-16	44H8000	1	Air Baffle
-17	21H9364	1	Power Supply, 480W
-18	1621812	4	Screw
-19	44H7934	1	Card Guide
-20	1621812	3	Screw
-21	45H1226	1	not applicable
-22	1621812	4	not applicable
-23	44H8167	1	• Main Storage Filler Card
-24	44H4568	1	Side EMC Access Plate
-25	44H8681	15	Screw
-26	44H8640	1	Power Cord Clamp - Lower
-27	44H8641	1	Power Cord Clamp - Upper
-28	1621811	1	Screw

Assembly 3: Disk Unit/Holder Assembly



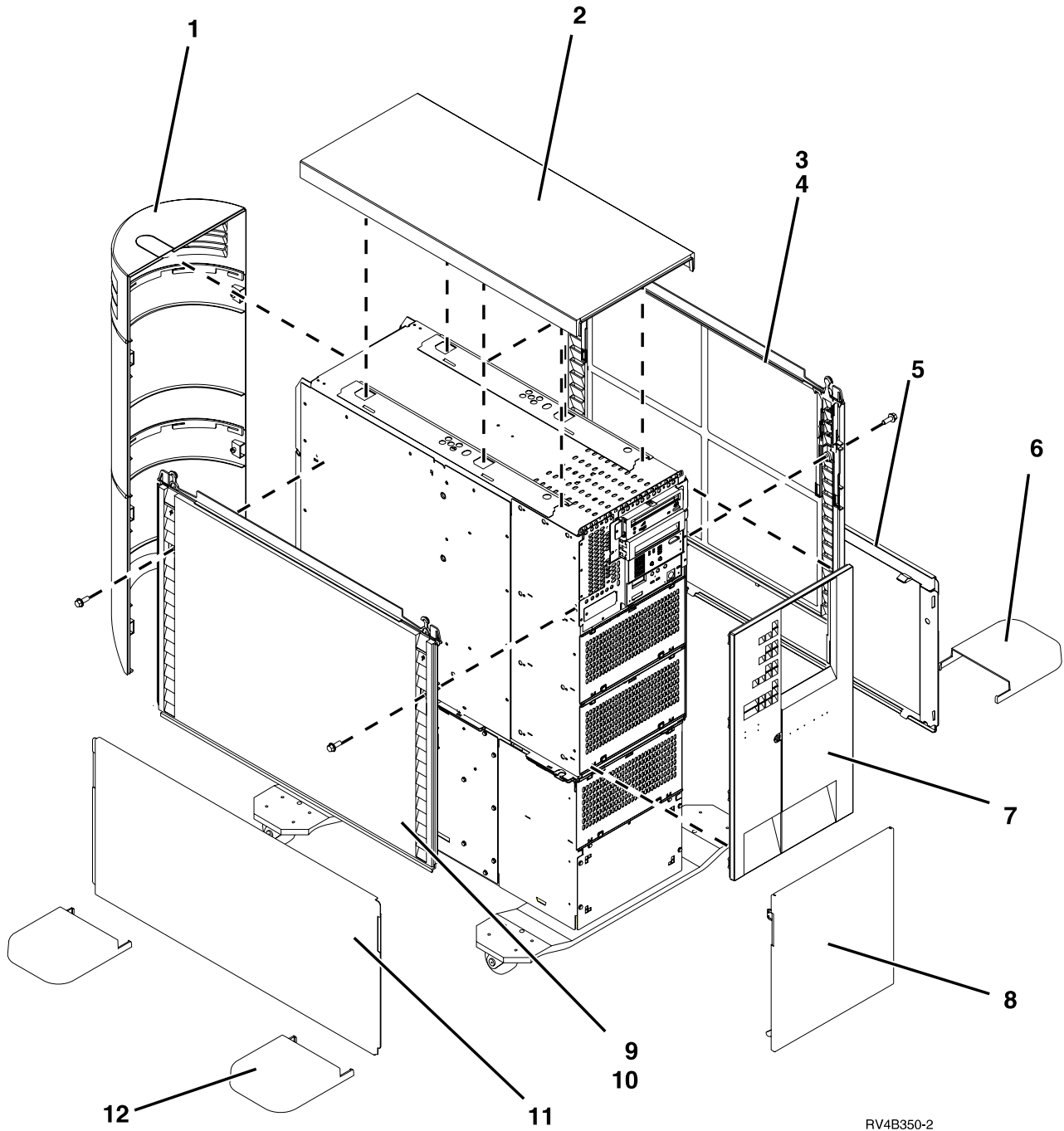
RV4B304-3

Assembly 3: (continued)

Asm- Index	Part Number	Units	Description
3- -1	NONUM	AR	Disk Unit/Holder Asm • Disk Unit See "Disk Unit Type, Model, and Part Number List" on page 756.
-2	44H8974	1	• Holder Asm - Disk Unit, FC 6602-1
-2	44H8995	1	• Holder Asm - Disk Unit, FC 6602-0
-2	44H8996	1	• Holder Asm - Disk Unit, FC 6603-0
-2	44H8998	1	• Holder Asm - Disk Unit, FC 6603-1
-2	44H8999	1	• Holder Asm - Disk Unit, FC — all others
-3	44H4266		• Screw, Disk Unit Mount

FC 5034 and FC 5035 Assemblies

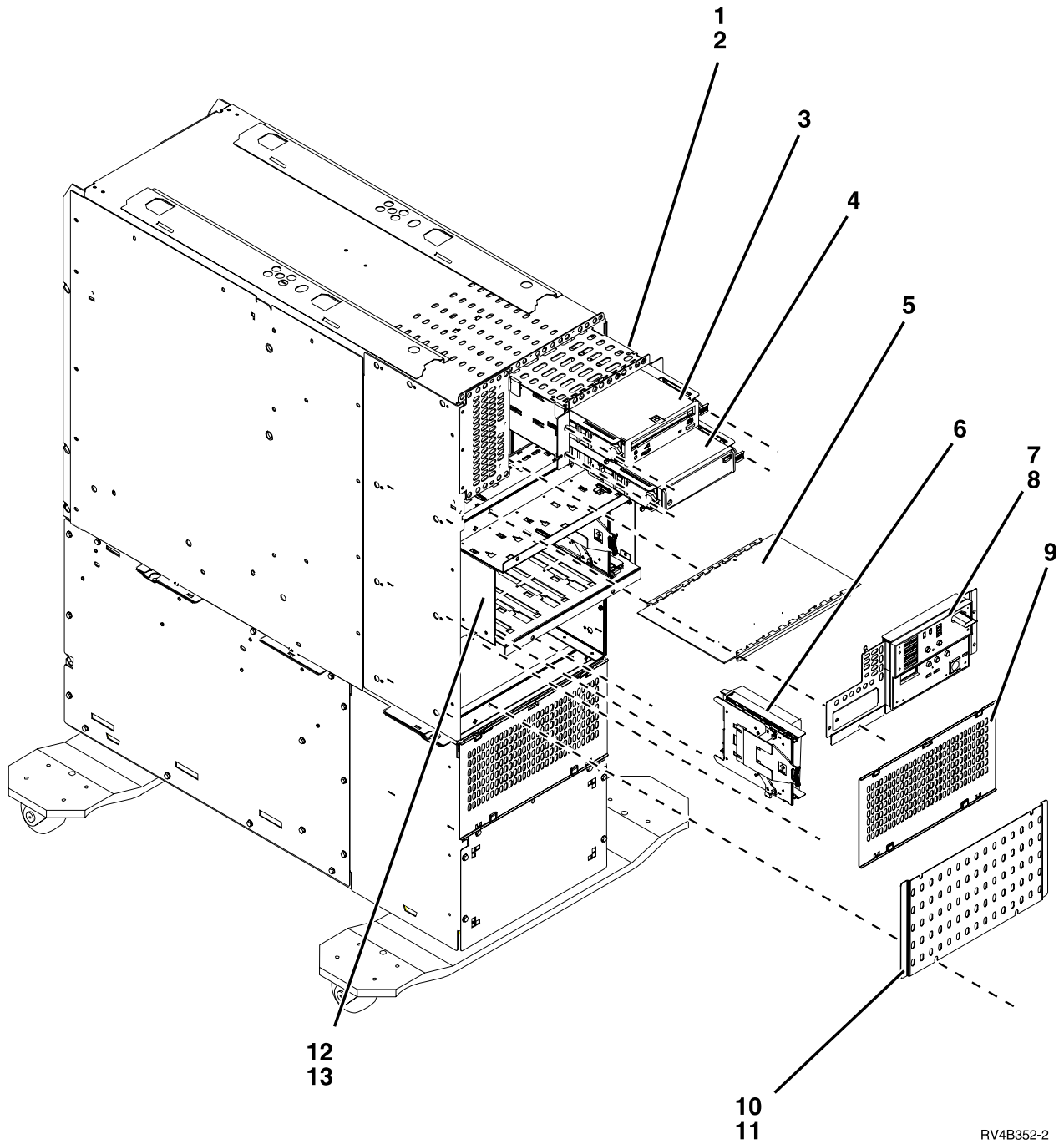
Assembly 4: Cover Assemblies for FC 5034 and FC 5035 migrated towers



Assembly 4: (continued)

Asm- Index	Part Number	Units	Description
4-1	44H8582	1	Cover Asm, Rear
-2	44H7742	1	Cover, Top
-3	44H7743	1	Cover, Side Upper
-4	1621811	2	Screw
-5	44H7895	1	Cover, Side Lower
-6	44H7892	2	Cover, Foot
-7	90H6584	1	Cover Asm, Front (if migrated from model 620 or S20)
-7	97H7769	1	Cover Asm, Front (if migrated from model 720)
-8	44H7880	1	Cover Asm, Front Lower
-9	44H7743	1	Cover, Side
-10	1621811	2	Screw
-11	44H7895	1	Cover, Side Lower
-12	44H7892	2	Cover, Foot

Assembly 5: Final Assemblies for FC 5034 and FC 5035 migrated towers

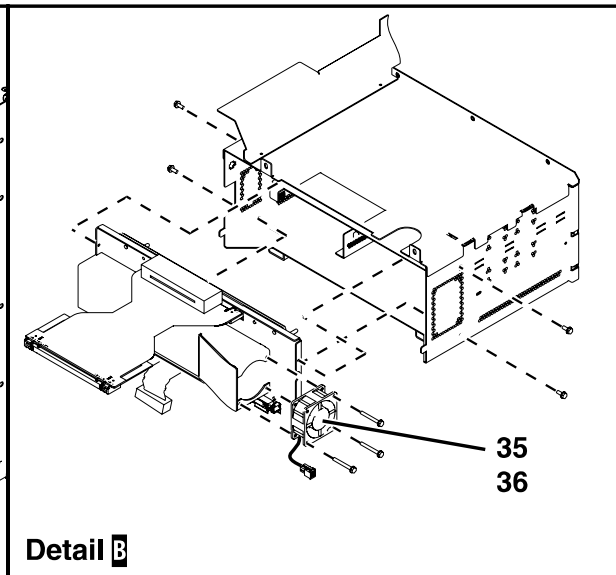
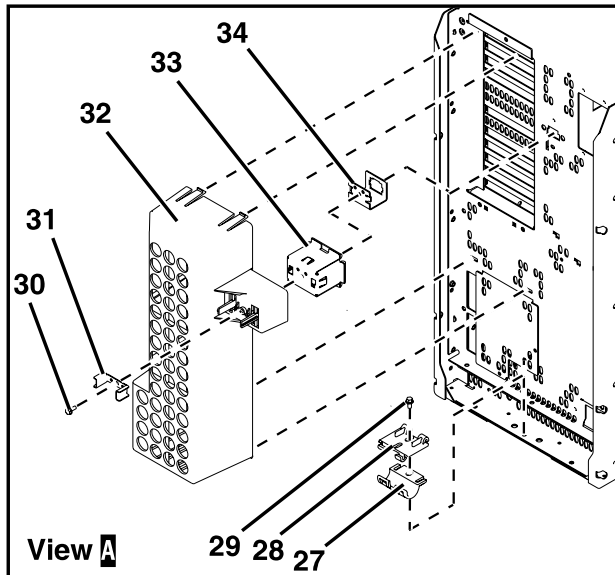
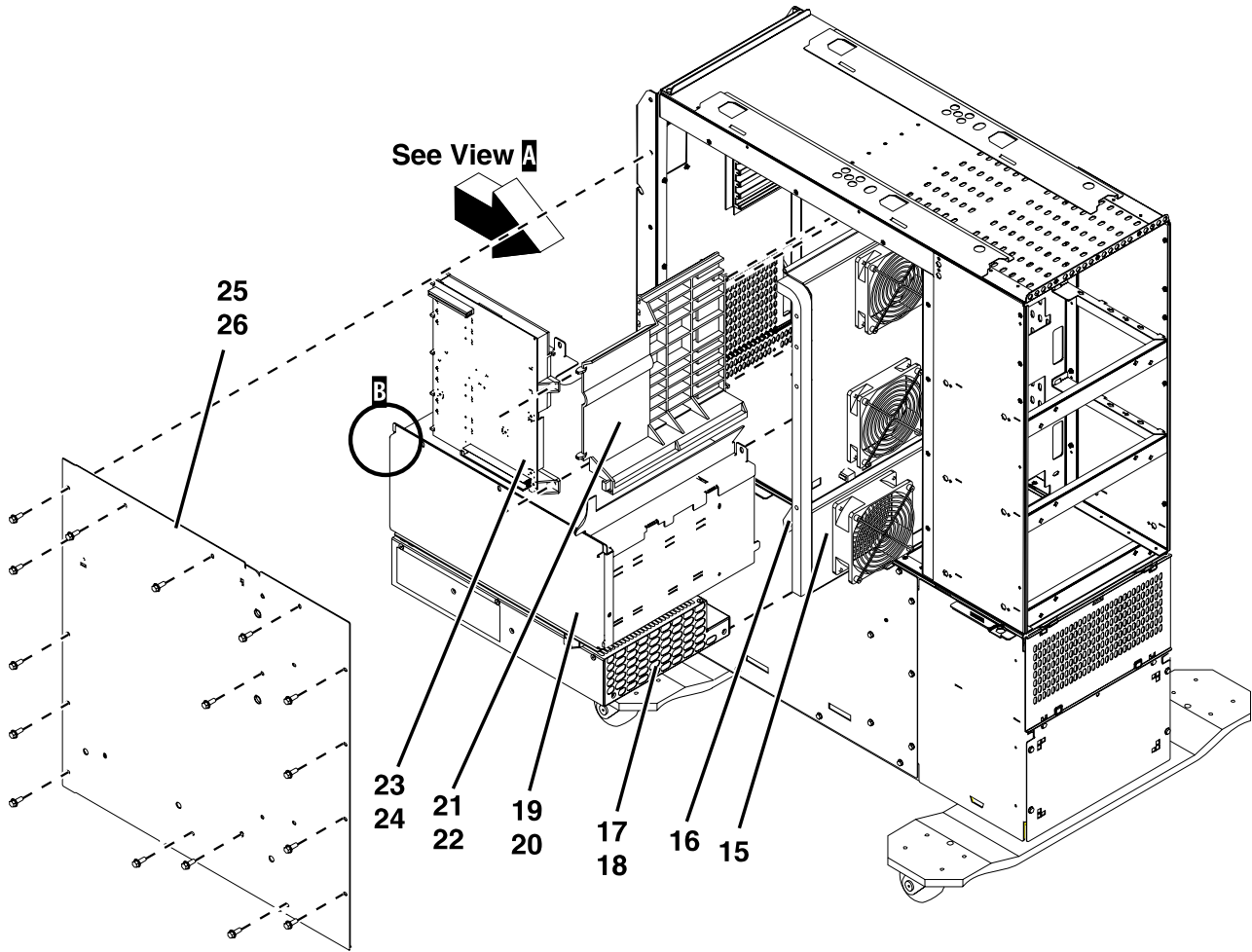


RV4B352-2

Assembly 5: (continued)

Asm- Index	Part Number	Units	Description
5-1	44H8421	1	Removable Media Frame Asm
-2	1621811	5	Screw
-3		1	Optical Device/Holder Asm See "Type, Model, and Part Number List" on page 750
-4	44H8406	1	Removable Media Filler Asm
-4		1	Removable Media/Holder Asm See "Type, Model, and Part Number List" on page 750
-4	44H4636	AR	Connector Cover (when media is not installed)
-5	44H8141	1	Card, SPCN panel (control panel with keystick)
-5	44H8313	1	Card, SPCN panel (control panel without keystick)
-6		AR	Disk Unit/Holder Asm See "Disk Unit Type, Model, and Part Number List" on page 756.
-6	44H4636	AR	Connector Cover (when media is not installed)
-7	NONUM	1	Control Panel Asm
-8	1621811	4	Screw
-9	44H7997	1	Disk Unit EMC access plate
-10	44H7924	1	Disk Unit Blank Cover
-11	1621811	4	Screw
-12	91H3905	1	Disk Unit Frame Asm, Base
-12	91H3906	1	Disk Unit Frame Asm, Feature
-13	1621811	4	Screw

Assembly 5: (continued)

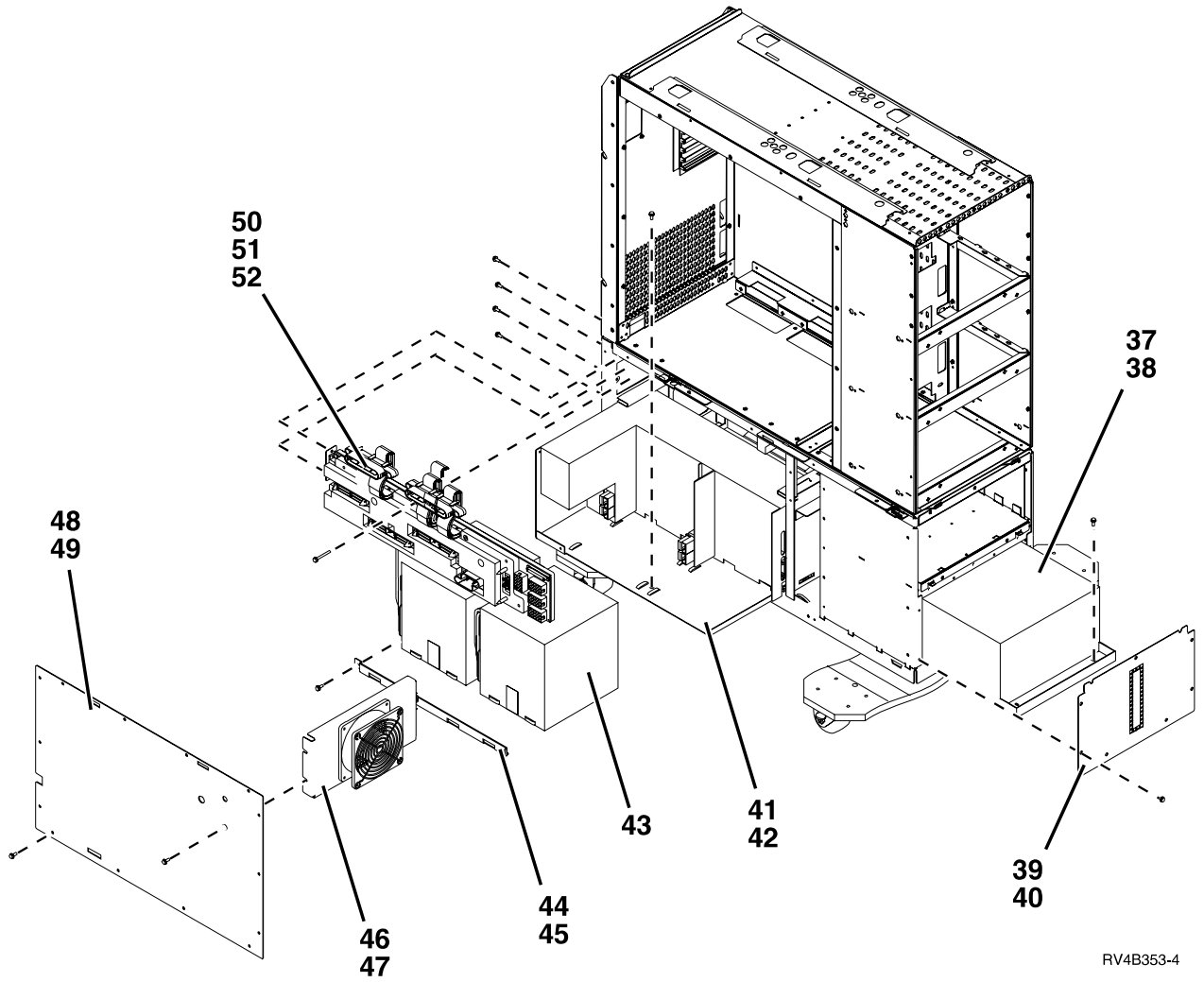


RV4B351-4

Assembly 5: (continued)

Asm- Index	Part Number	Units	Description
5-15	44H7756	1	AMDP Asm
-16	44H8317	1	Air Baffle
-17	21H9364	1	Power Supply, 480W
-18	1621811	4	Screw
-19	44H8536	1	Main storage card
-19	44H8167	1	• Main Storage Filler Card
-20	1621811	2	Screw
-21	44H7934	1	Card Guide
-22	1621811	3	Screw
-23	45H1226	1	Card/Stiffener Asm
-24	1621811	4	Screw
-25	44H4568	1	Side EMC Access Plate
-26	44H8681	15	Screw
-27	44H8640	1	Power Cord Clamp - Lower
-28	44H8641	1	Power Cord Clamp - Upper
-29	1621811	1	Screw
-30	1621811	1	Screw*
-31	44H8315	1	Latch Stop*
-32	44H8290	1	Safety Cover*
-33	44H8289	1	EMC Shield/Jumper Plug*
-34	44H8288	1	Bracket*
			*— Some models do not have these parts.
-35	44H4650	1	AMD 9
-36	1621816	3	Screw

Assembly 5: (continued)

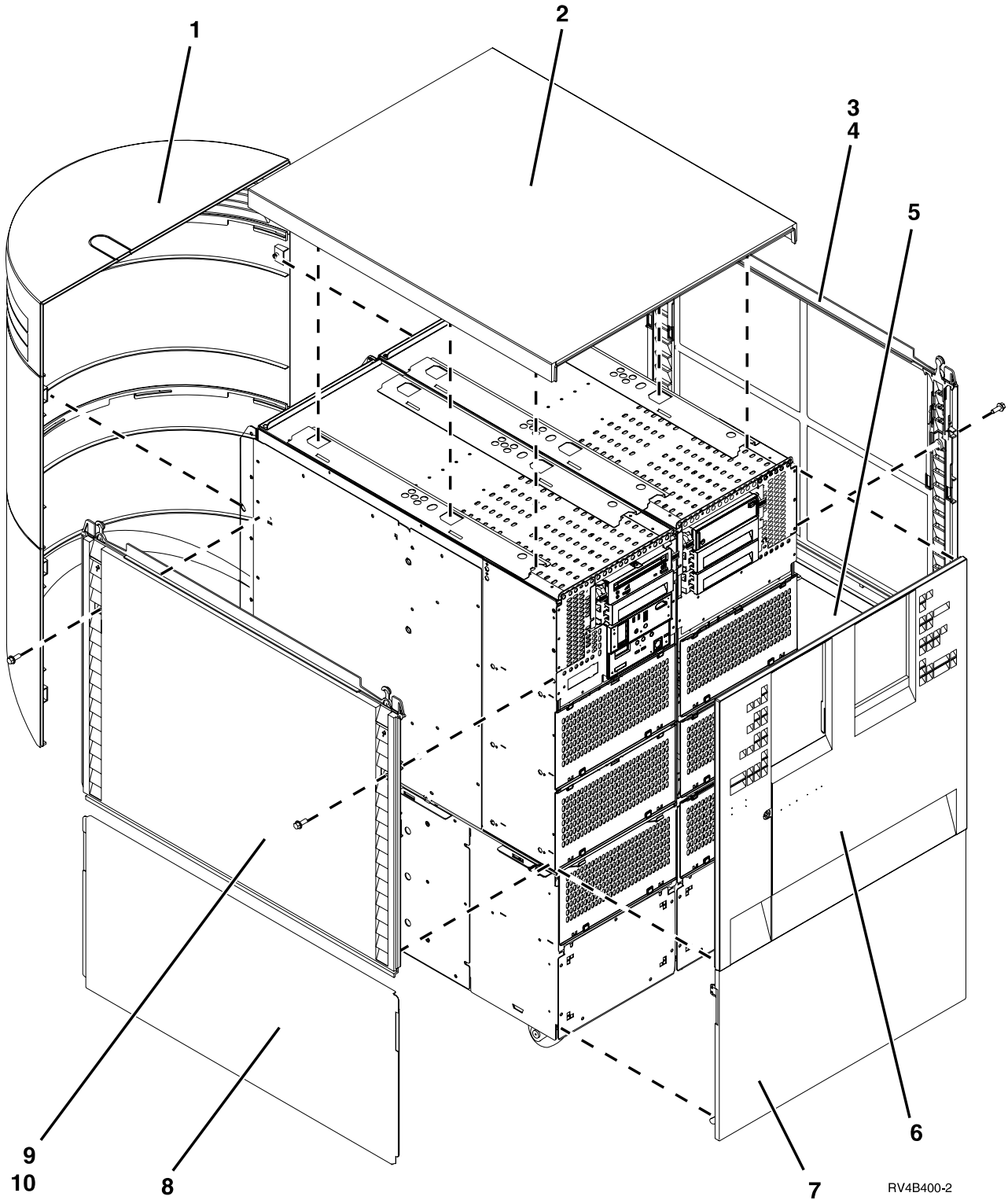


RV4B353-4

Assembly 5: (continued)

Asm- Index	Part Number	Units	Description
5-37	44H7786	1	Transformer
-38	1621811	3	Screw, M4 x 10mm
-39	44H8402	1	Plate, UPS
-40	1621811	9	Screw, M4 x 10mm
-41	44H7784	1	Power Supply, UPS
-42	1621811	9	Screw, M4 x 10mm
-43	44H7785	2	Battery
-44	44H8245	1	Bar, Battery pack retaining
-45	1621811	1	Screw, M4 x 10mm
-46	44H7889	1	AMD2 Asm
-47	1621811	2	Screw, M4x 10mm
-48	44H7886	1	Side EMC Access Plate
-49	1621811	14	Screw, M4 x 10mm
-50	44H8400	1	Power Distribution Card
-51	1621811	8	Screw, M4 x 35mm
-52	90H6284	4	Screw, M4 x 8mm

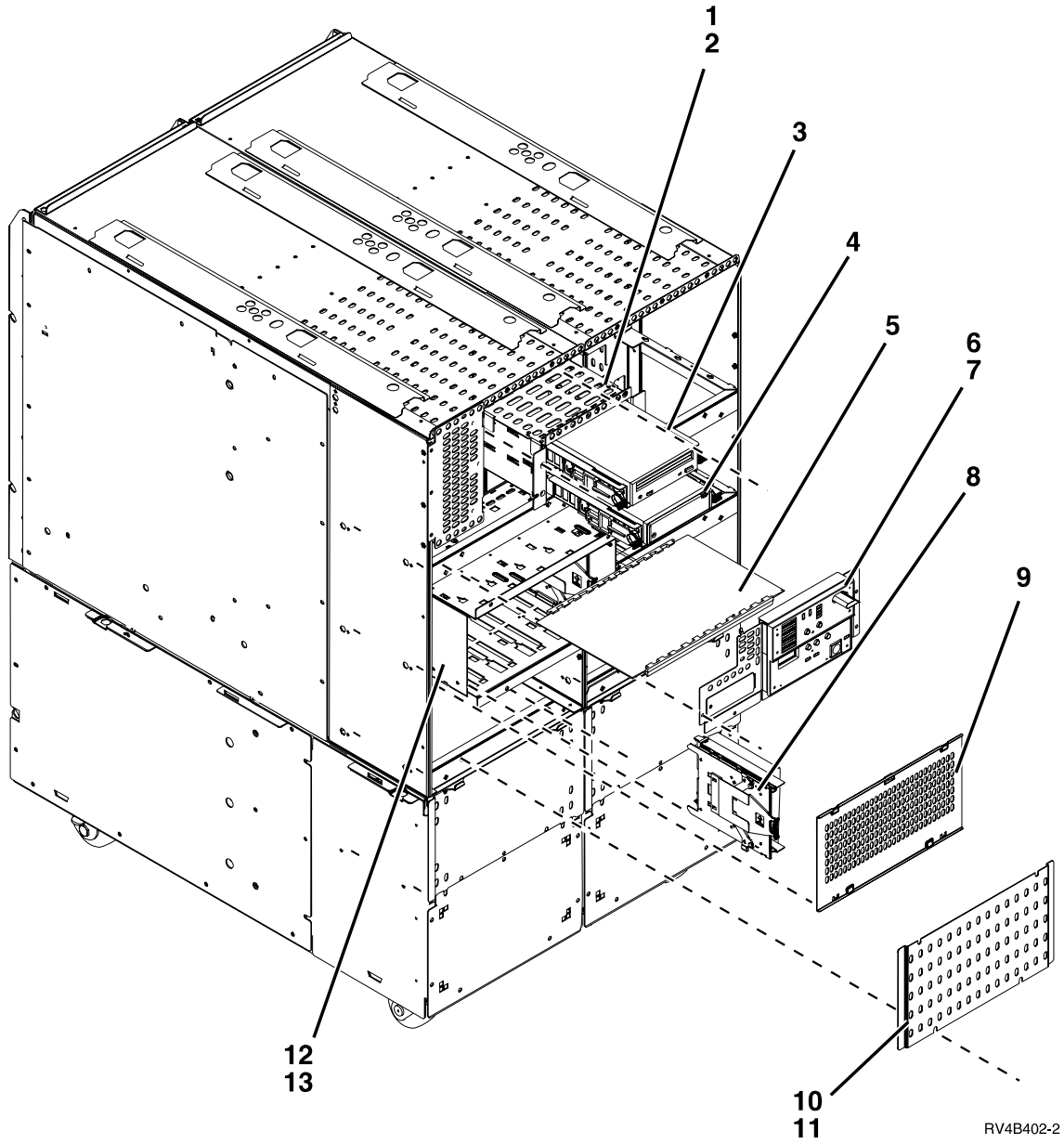
Assembly 6: Cover Assemblies for FC 5034 and FC 5035 migrated towers with Expansion Unit



Assembly 6: (continued)

Asm- Index	Part Number	Units	Description
6-1	44H8205	1	Cover Asm, Rear (if migrated from model 620)
-1	44H8586	1	Cover Asm, Rear (if migrated from model S20 or 720)
-2	44H7760	1	Cover, Top
-3	44H7743	1	Cover, Side Upper
-4	1621811	2	Screw (10mm)
-5	44H7895	1	Cover, Side Lower
-6	44H8135	1	Cover Asm, Front (if migrated from model 620)
-6	90H6586	1	Cover Asm, Front (if migrated from model S20)
-6	97H7770	1	Cover Asm, Front (if migrated from model 720)
-7	44H7884	1	Cover, Front Lower
-8	44H7895	1	Cover, Side Lower
-9	44H7743	1	Cover, Side
-10	1621811	2	Screw (10mm)

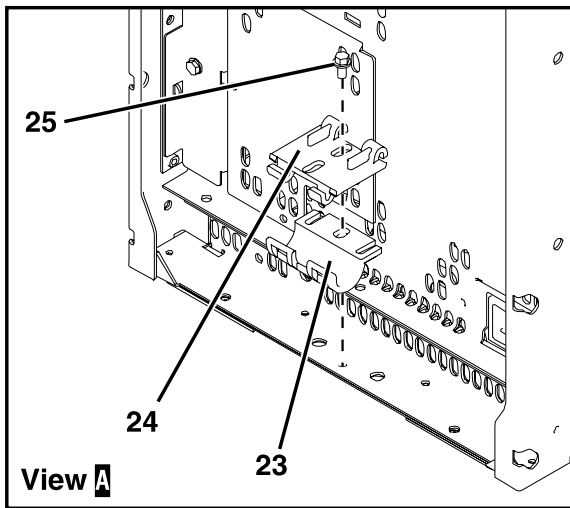
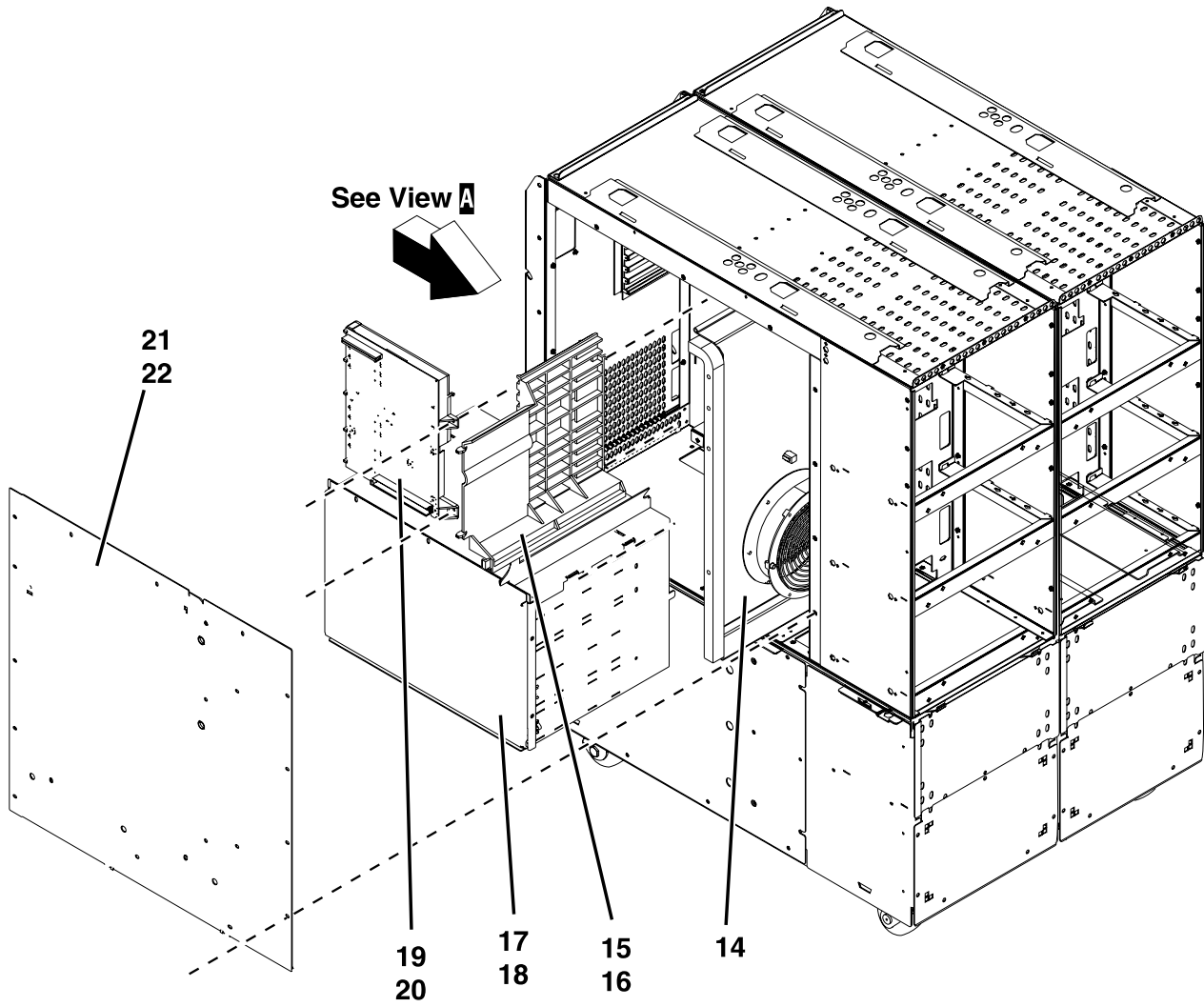
Assembly 7: Final Assemblies for FC 5034 and FC 5035 migrated towers with Expansion Unit



Assembly 7: (continued)

Asm- Index	Part Number	Units	Description
7-1	44H8421	1	Removable Media Frame Asm
-2	1621812	5	Screw (8mm)
-3		1	Optical Device/Holder Asm See "Type, Model, and Part Number List" on page 750.
-4		1	Removable Media/Holder Asm See "Type, Model, and Part Number List" on page 750.
-4	44H4636	AR	Connector Cover (when media is not installed)
-4	44H8406	AR	Removable Media Filler Asm
-			Optical and tape bracket — model 600
-			Screw
-5		1	not applicable
-6	NONUM	1	Control Panel Asm
-7	1621811	4	Screw M4 (10mm)
-8		AR	Disk Unit/Holder Asm See "Disk Unit Type, Model, and Part Number List" on page 756.
-8	44H4636	AR	Connector Cover (when media is not installed)
-9	44H7997	1	Disk Unit EMC access plate
-10	44H7924	1	Disk Unit Blank Cover
-11	1621811	4	Screw M4 (10mm)
-12	91H3905	1	Disk Unit Frame Asm, Base
-12	91H3906	1	Disk Unit Frame Asm, Feature
-13	1621811	4	Screw (10mm)

Assembly 7: (continued)

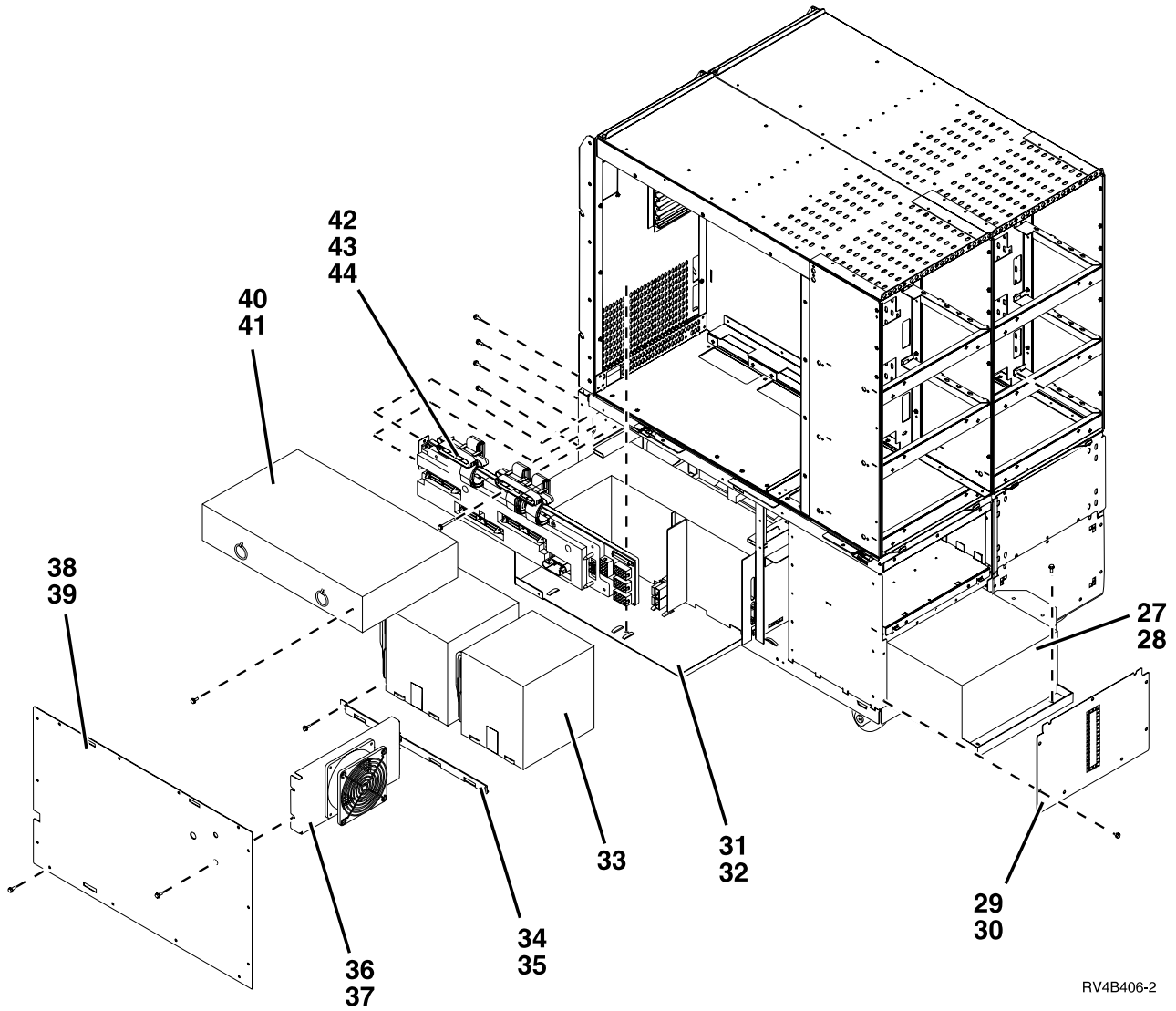


RV4B401-3

Assembly 7: (continued)

Asm- Index	Part Number	Units	Description
7-14	44H8336	1	AMD1 Asm
-15	44H7934	1	Card Guide
-16	1621812	3	Screw (8mm)
-17	44H8167	1	• Main Storage Filler Card
-18	1621811	6	Screw M4 (10mm)
-19	45H1226	1	Card/Stiffener Asm
-20	1621812	4	Screw (8mm)
-21	44H4568	1	Side EMC Access Plate
-22	44H8681	15	Screw (10mm)
-23	44H8640	1	Power Cord Clamp - Lower
-24	44H8641	1	Power Cord Clamp - Upper
-25	1621811	1	Screw M4 (10mm)

Assembly 7: (continued)



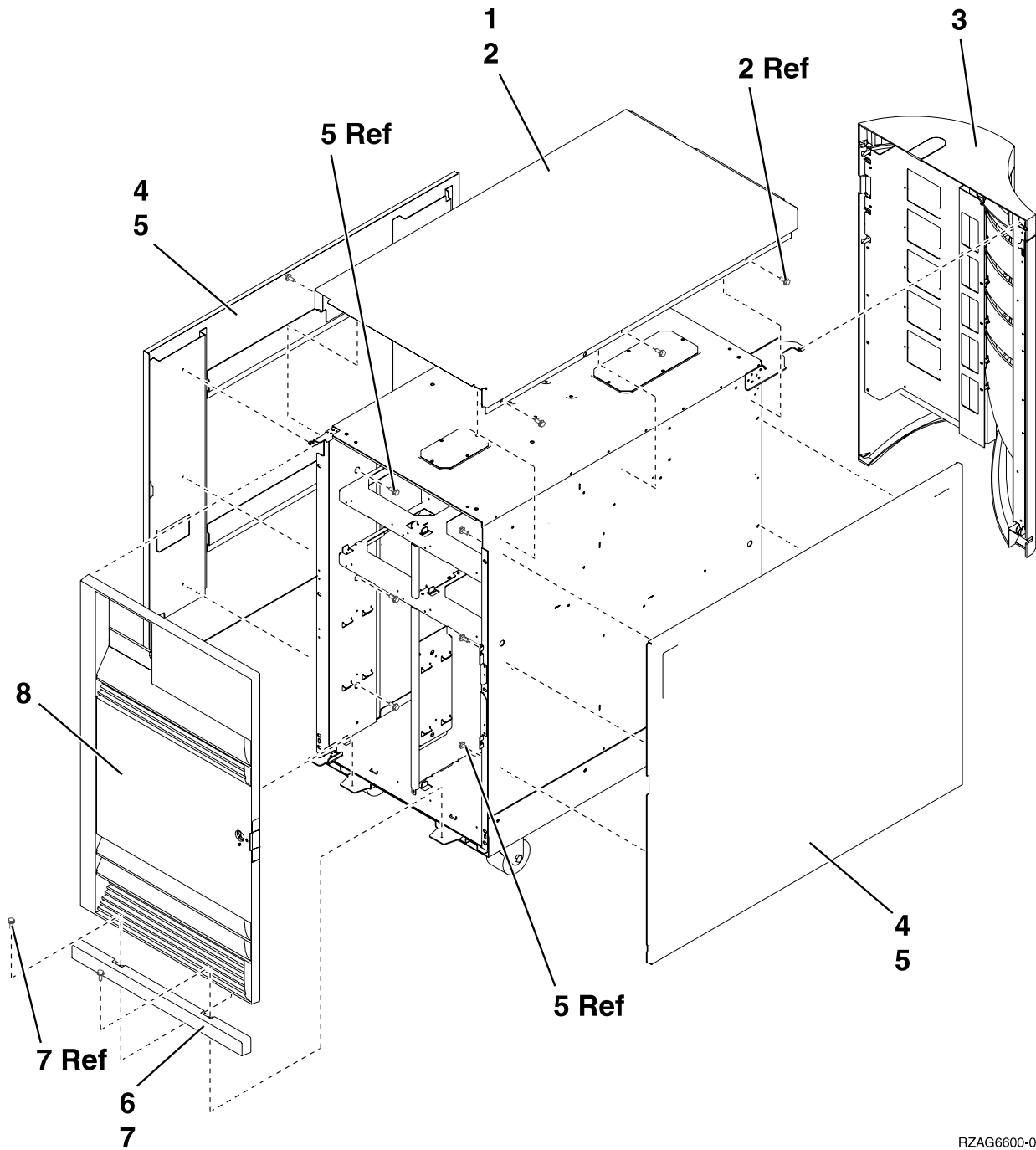
RV4B406-2

Assembly 7: (continued)

Asm- Index	Part Number	Units	Description
7-27	44H7786	1	Transformer
-28	1621811	3	Screw, M4 x 10mm
-29	44H8402	1	Plate, UPS
-30	1621811	9	Screw, M4 x 10mm
-31	44H7784	1	Power Supply, UPS
-32	1621811	9	Screw, M4 x 10mm
-33	44H7785	2	Battery
-34	44H8245	1	Bar, Battery pack retaining
-35	1621811	1	Screw, M4 x 10mm
-36	44H7889	1	AMD2 Asm
-37	1621811	2	Screw, M4 x 10mm
-38	44H7886	1	Side EMC Access Plate
-39	1621811	14	Screw, M4 x 10mm
-40	44H7779	1	Power Supply
-41	1621811	4	Screw
-42	44H8401	1	Power Distribution Card
-43	1621838	8	Screw, M4 x 35mm
-44	90H6284	4	Screw, M4 x 8mm

FC 5065 or FC 5066 Assemblies

Assembly 8: Cover Assemblies for FC 5065 or FC 5066 expansion tower

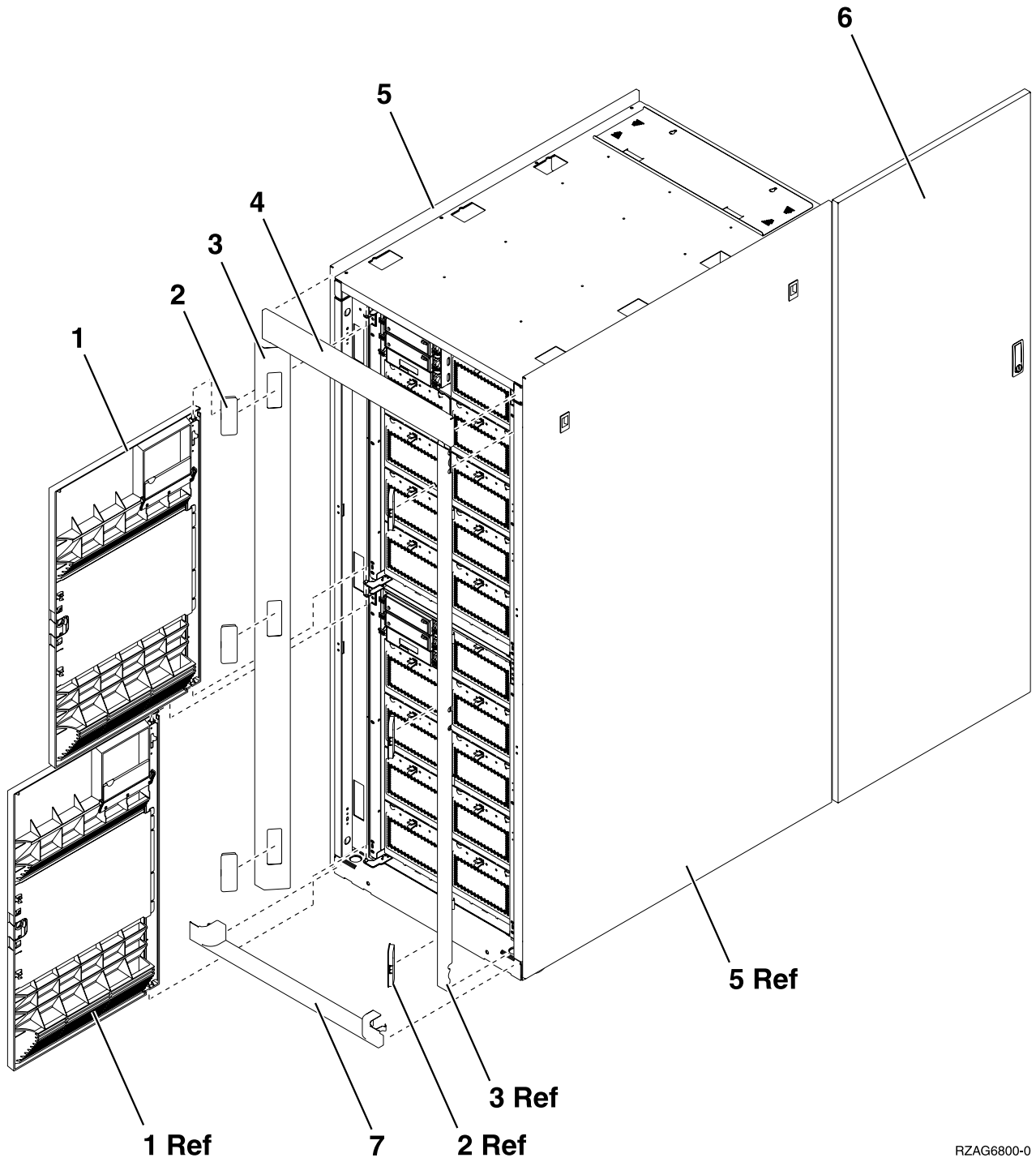


RZAG6600-0

Assembly 8: (continued)

Asm- Index	Part Number	Units	Description
8-1	24L0825	1	Top cover
-2	1621811	4	Screw
-3	24L1079	1	Rear cover
-4	24L0824	1	Side cover
-5	1621811	12	Screw
-6	24L1078	1	Front filler cover
-7	1621811	2	Screw
-8	24L1069	1	Front cover

Assembly 8: (continued)

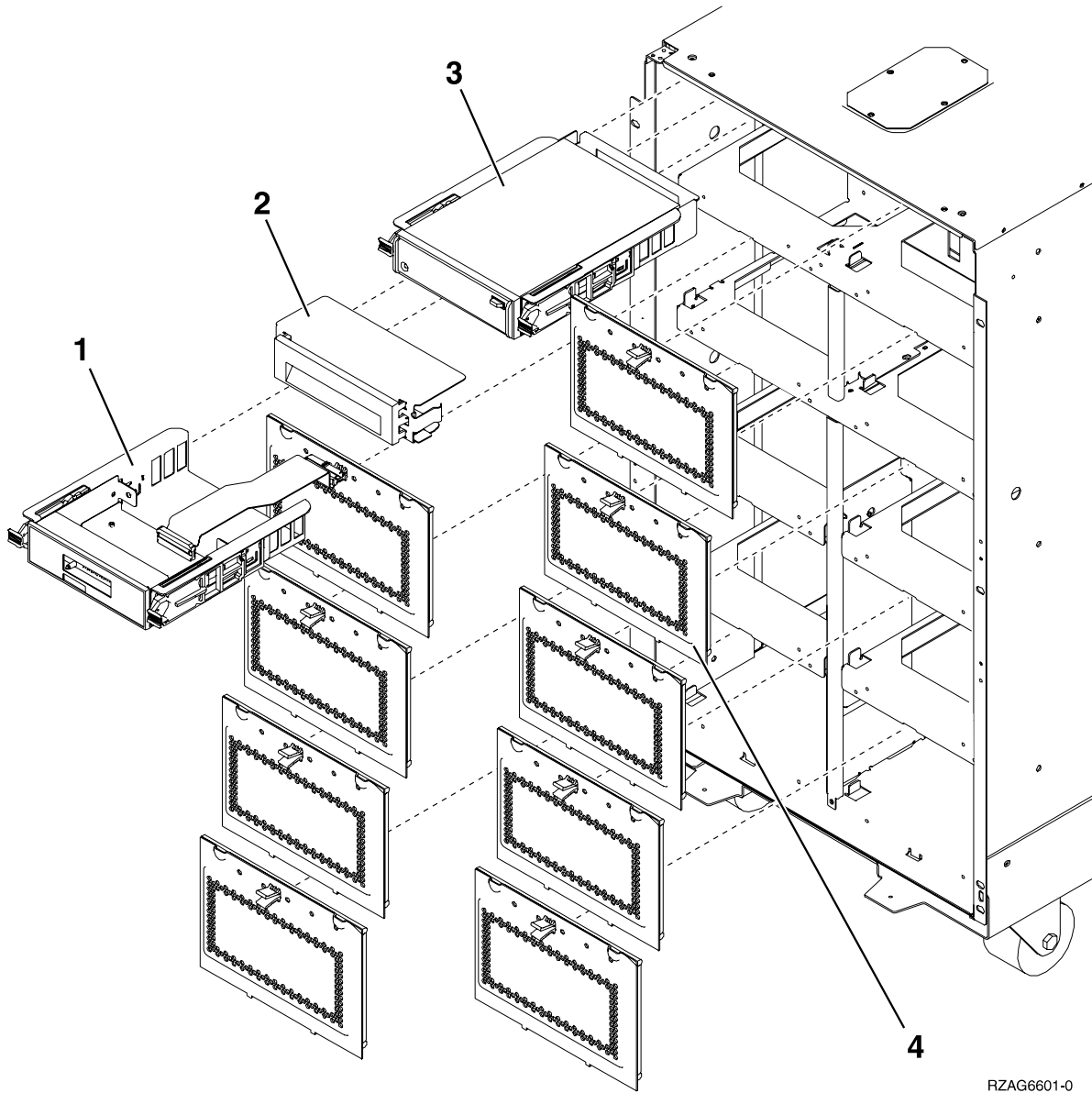


RZAG6800-0

Assembly 8: (continued)

Asm- Index	Part Number	Units	Description
8-1	24L1069	2	Cover Asm, Front
-2	05N6809	6	Cover, Trim Kit
-3	12K0034	2	Side Bezel, Trim Kit
-4	12K0032	1	Top Bezel, Trim Kit
-5	31L7519	2	Cover, Side
-6	31L7523	1	Cover, Rear
-7	12K0024	1	Bottom Bezel, Trim Kit

Assembly 9: Final Assemblies for FC 5065 or FC 5066 expansion tower

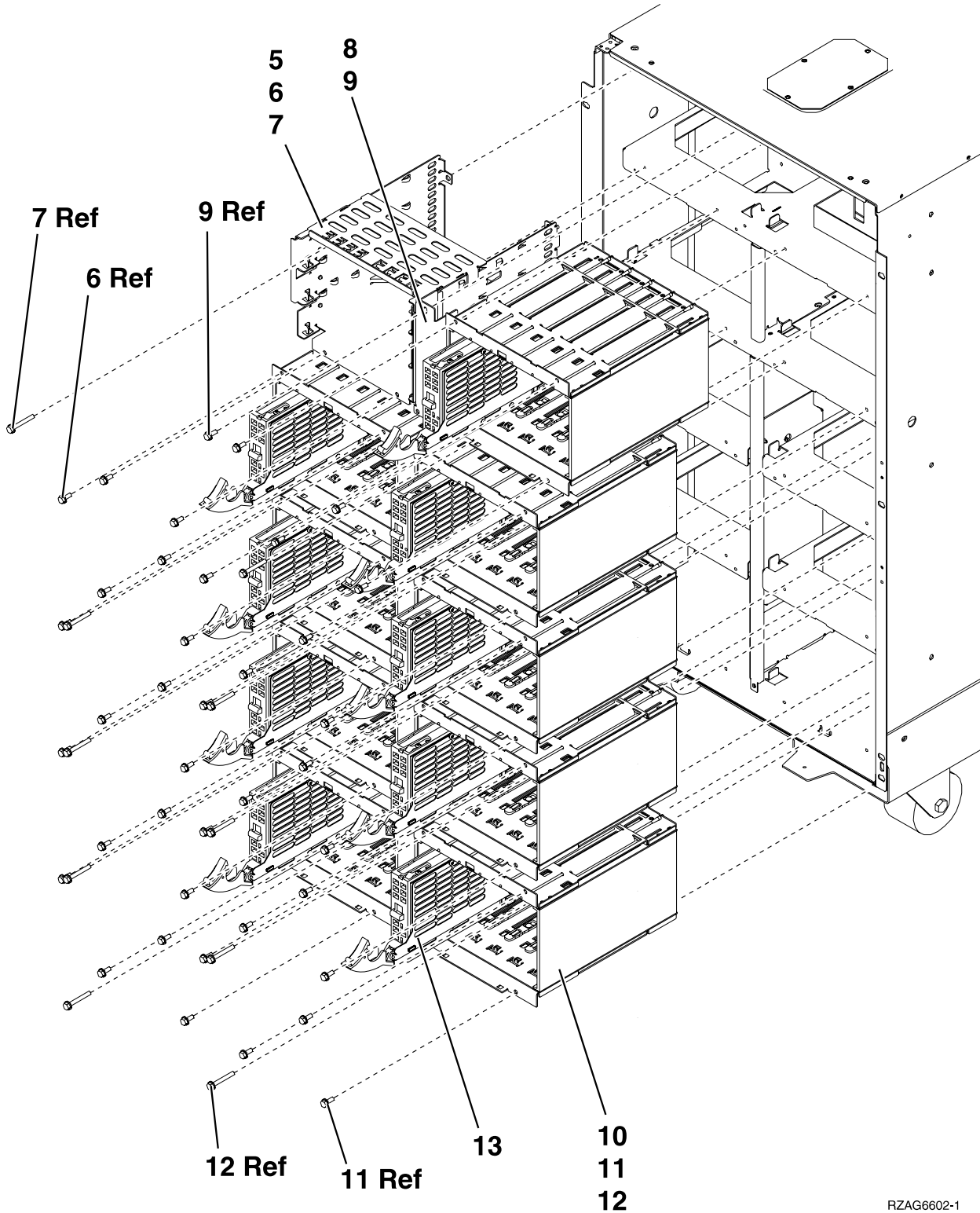


RZAG6601-0

Assembly 9: (continued)

Asm- Index	Part Number	Units	Description
9-1	24L0946	1	Control Panel
-2	44H8406	AR	Filler (Removable media)
-2		AR	Optical Storage Unit See "Type, Model, and Part Number List" on page 750.
-3		AR	Removable media See "Type, Model, and Part Number List" on page 750.
-4	24L0821	AR	Disk Unit EMC access plate

Assembly 9: (continued)

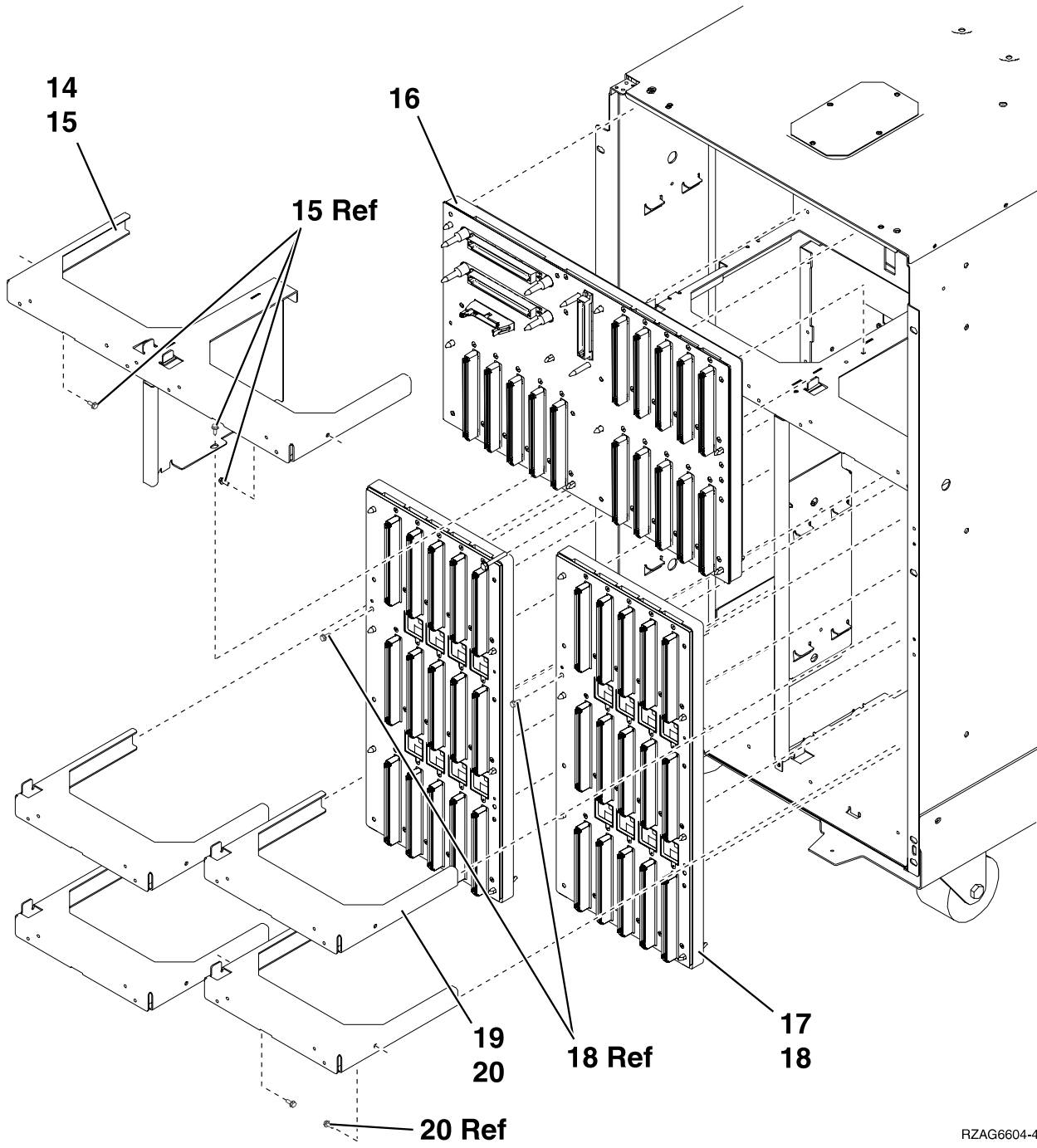


RZAG6602-1

Assembly 9: (continued)

Asm- Index	Part Number	Units	Description
9-5	NONUM	1	Removable media cage assembly
-6	1621811	2	Screw
-7	1621817	2	Screw
-8	24L1067	1	Center Support Bracket
-9	1621811	2	Screw
-10	NONUM	AR	5 disk unit cage assembly
-11	1621811	12	Screw
-12	1621817	6	Screw
-13		AR	Disk unit assembly See "Disk Unit Type, Model, and Part Number List" on page 756.

Assembly 9: (continued)

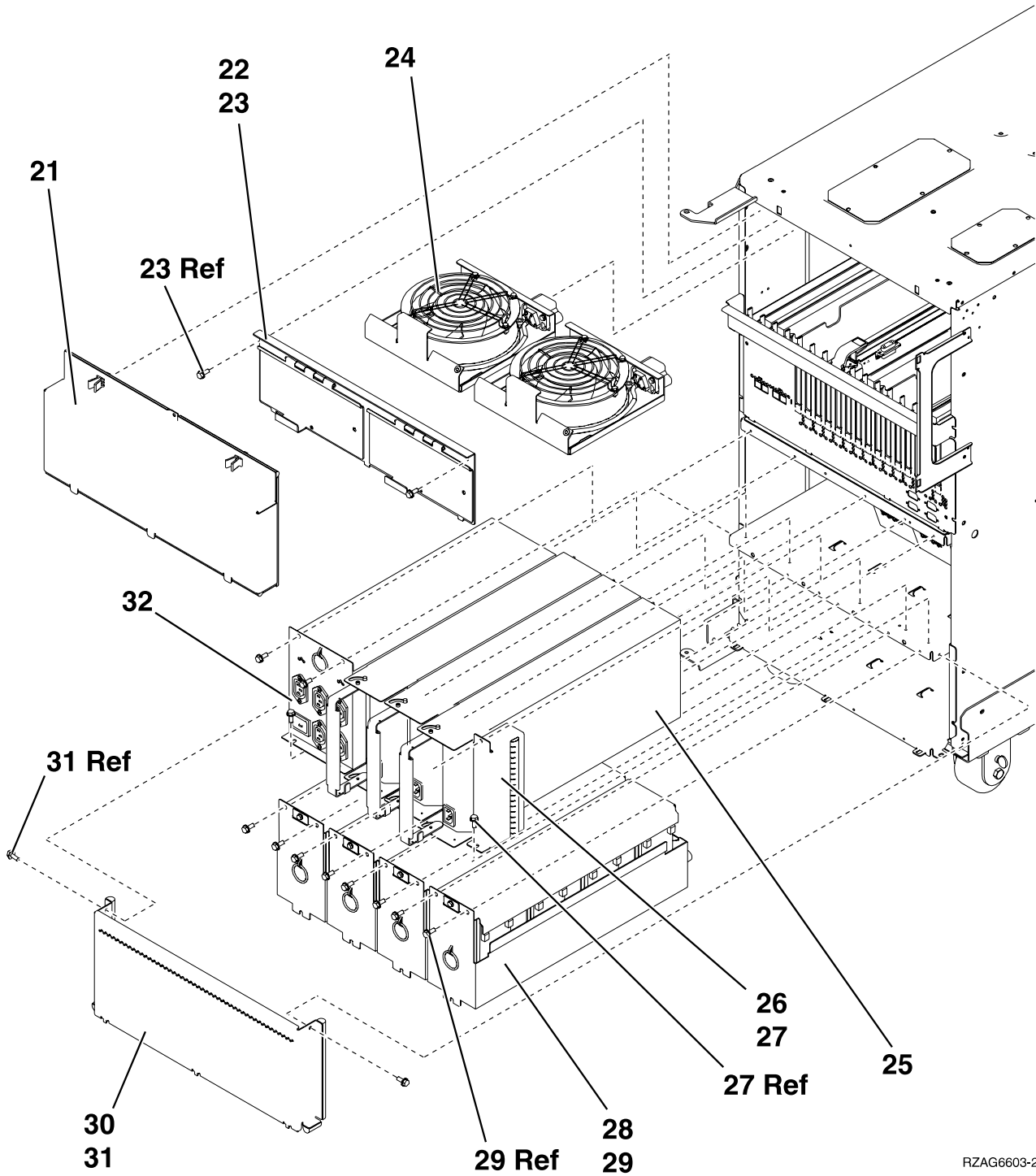


RZAG6604-4

Assembly 9: (continued)

Asm- Index	Part Number	Units	Description
9-14	NONUM	1	Shelf, Base Disk Unit
-15	1621811	3	Screw
-16	24L0892	1	Base Disk Unit Bd/Stiff. Asm. (DB3)
-17	24L1029	AR	Disk Unit Bd/Stiff. Asm. (DB1 & DB2)
-18	1621838	1	Screw
-19	NONUM	AR	Shelf, Disk Unit
-20	162811	2	Screw

Assembly 9: (continued)

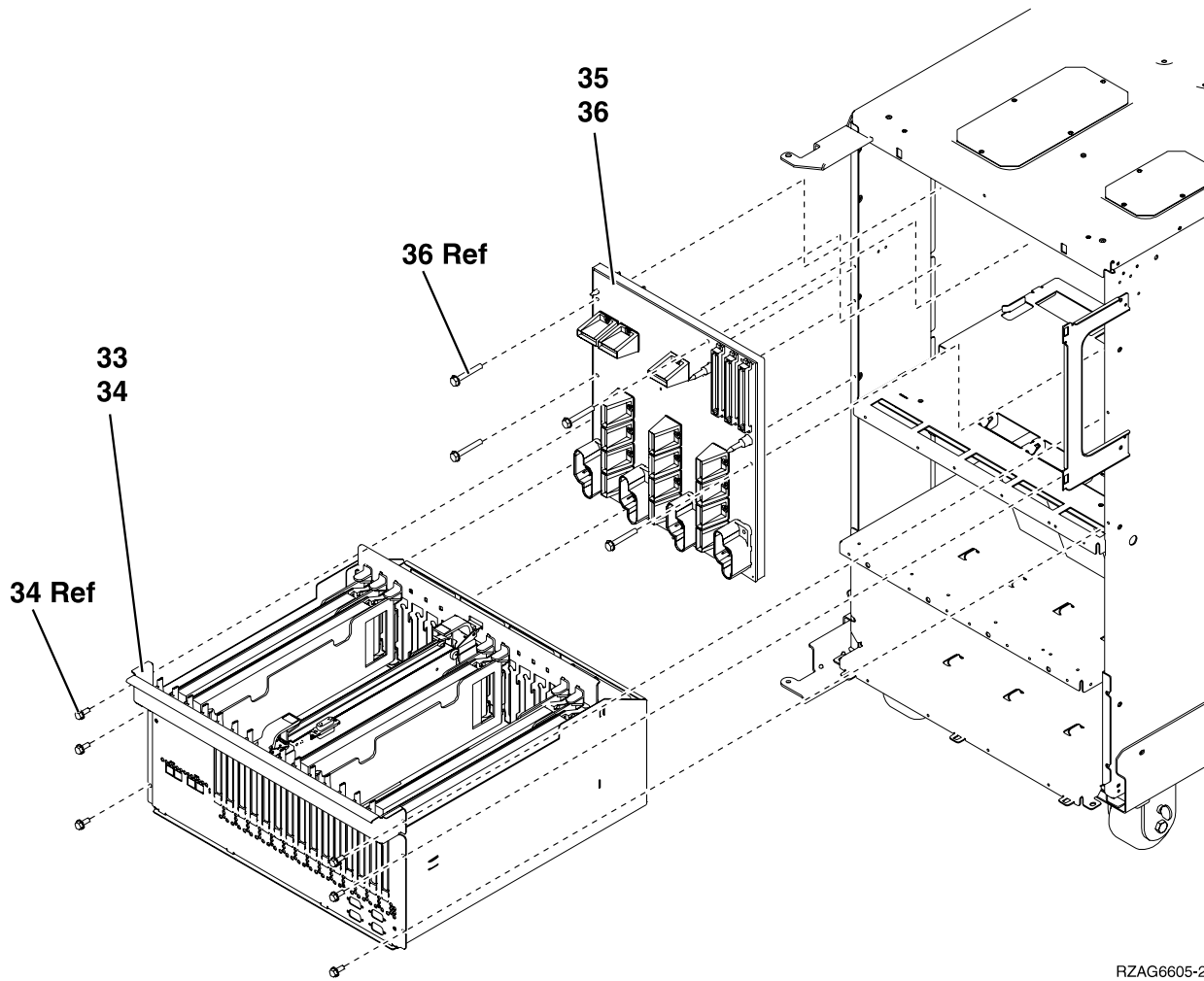


RZAG6603-2

Assembly 9: (continued)

Asm- Index	Part Number	Units	Description
9-21	24L0823	1	EMC access plate
-22	NONUM	1	AMD door assembly
-23	1621811	2	Screw
-24	44L0023	2	AMD
-25	90H6629	3	Power supply — 765 watts
-26	24L0940	AR	Filler for power supply
-27	1621811	2	Screw
-28	97H7320	4	Battery pack
-29	1621811	12	Screw
-30	NONUM	1	EMC access plate
-31	1621811	2	Screw
-32	97H7316	1	Battery Charger

Assembly 9: (continued)



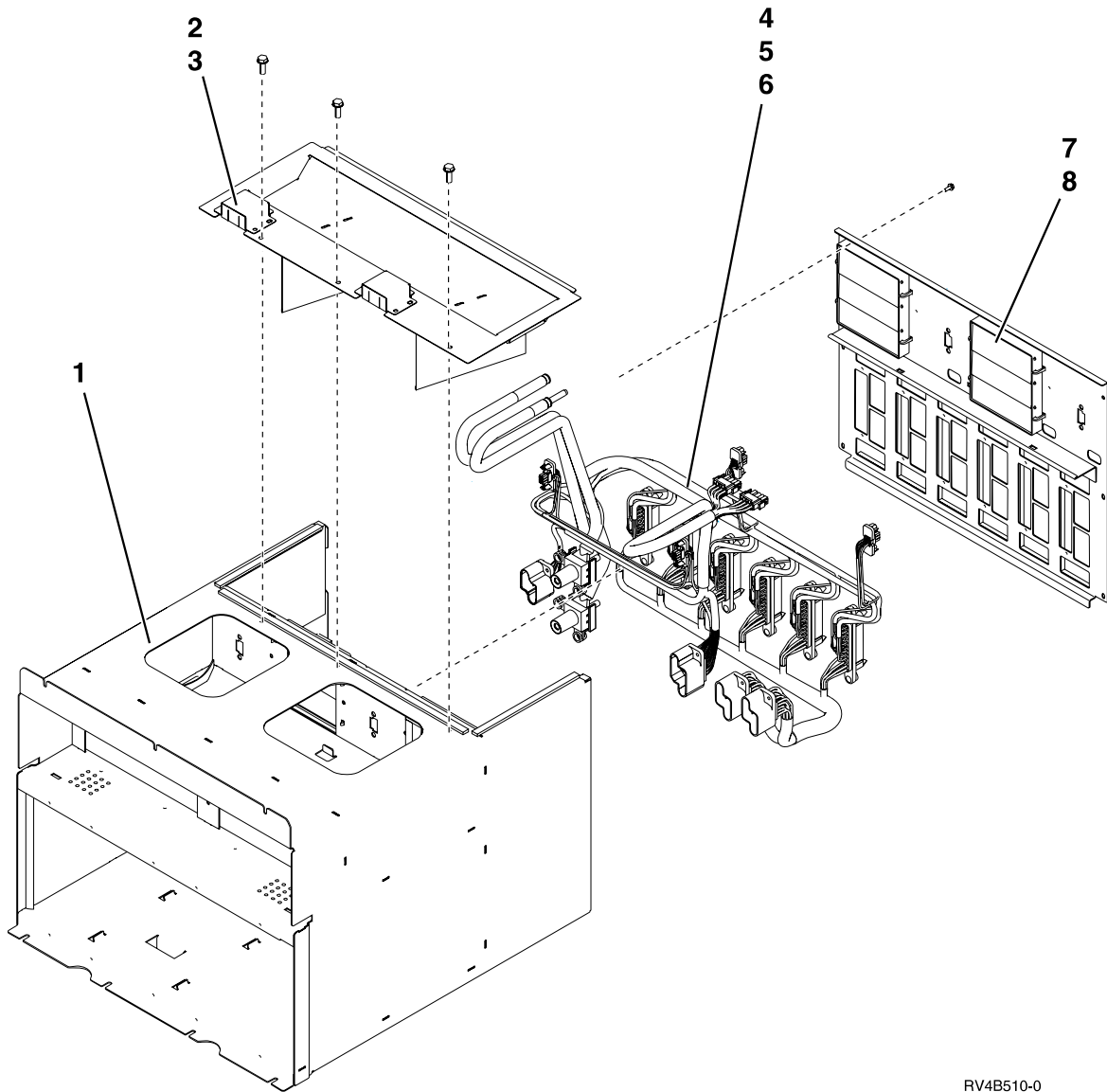
RZAG6605-2

Assembly 9: (continued)

Asm- Index	Part Number	Units	Description
9-33	24L0291	1	PCI Card Cage/Asm.
-34	1621811	6	Screw
-35	24L0891	1	Power Board/Stiff. Asm.
-36	1621816	6	Screw

FC 5077 Assemblies

Assembly 10: FC 5077 Power Subframe Assembly



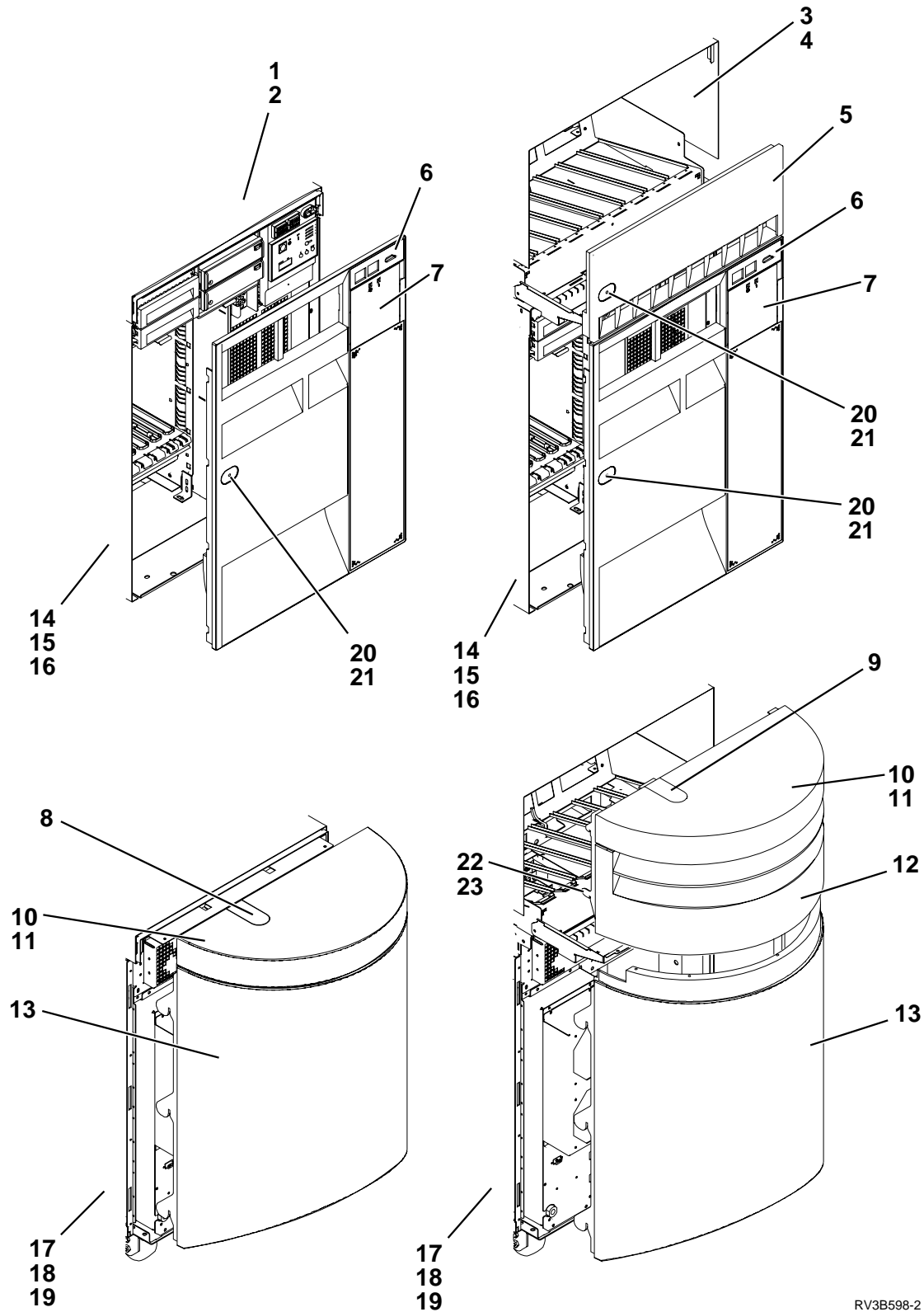
RV4B510-0

Assembly 10: (continued)

Asm- Index	Part Number	Units	Description
10-	90H6360	1	Power Subframe Assembly
-1	NONUM	1	• Power Subframe Cage
-2	NONUM	1	• Cover, Top
-3	NONUM	3	• Screw
-4	NONUM	1	• Power Distribution Harness
-5	NONUM	8	• Screw
-6	NONUM	12	• Screw
-7	NONUM	1	• Cover, Back
-8	NONUM	6	• Screw

Other Expansion Units Assemblies

Assembly 11: Cover Assemblies - FC 5077, 507x & 508x Expansion Units

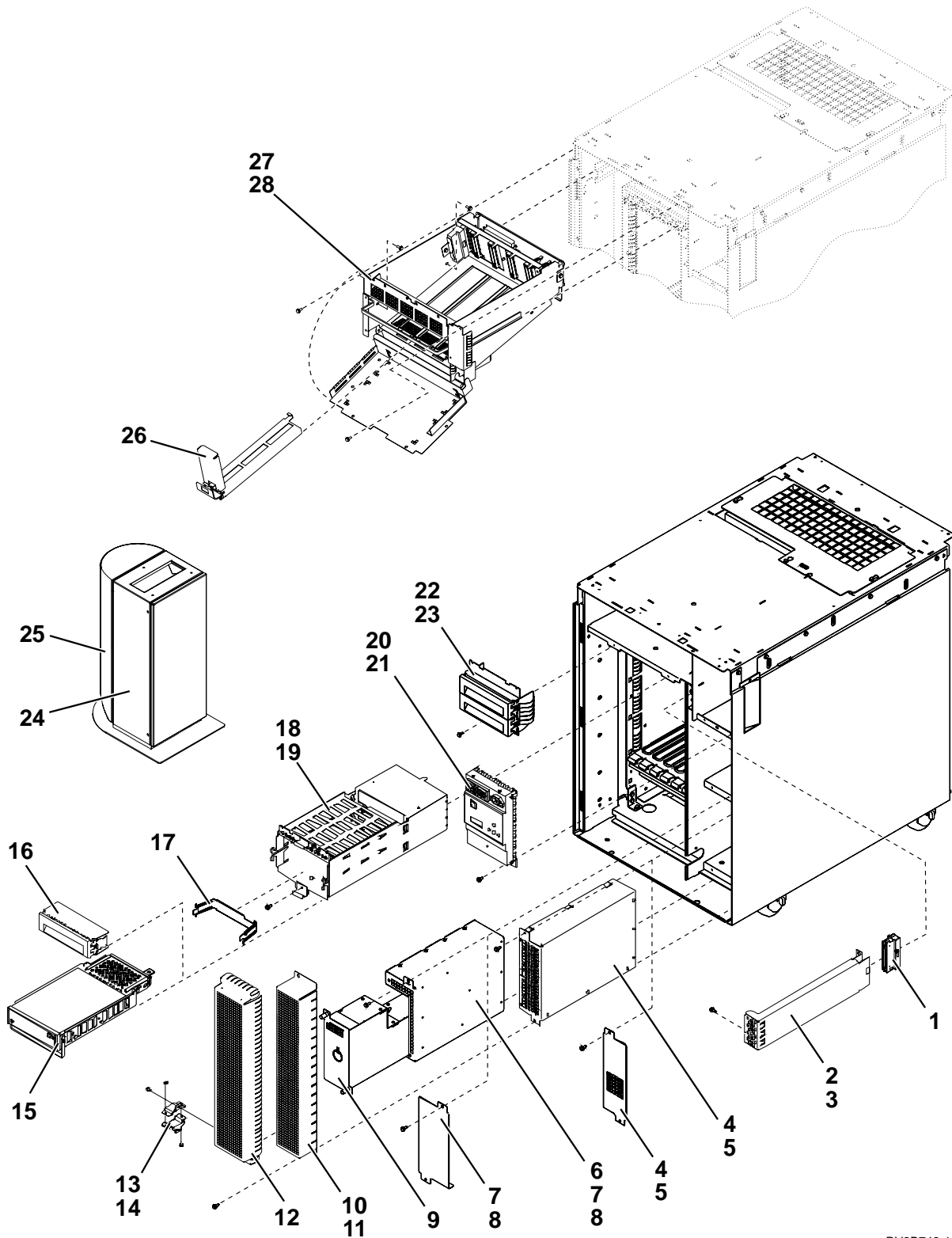


RV3B598-2

Assembly 11: (continued)

Asm- Index	Part Number	Units	Description
11-1	46G3484	1	Cover - Top
-2	1621812	3	Screw (8mm)
-3	46G3580	1	Cover - Top, Storage Expansion Unit
-4	1621811	AR	Screw, M4 (10mm)
-5	86G7739	1	Cover - Front, Storage Expansion Unit
-6	46G3478	1	Cover - Front (black)
-6	90H6507	1	Cover - Front (blue)
-6	90H6588	1	Cover - Front (red)
-7	86G7857	1	• Door - Contol Panel
-8	46G3688	1	Plug
-9	46G3670	1	Plug
-10	86G7677	1	Cover - Rear Top Cap
-11	1622677	5	Screw (12mm)
-12	86G7738	1	Cover - Rear, Storage Expansion Unit (black)
-12	21H3739	1	Cover - Rear, Storage Expansion Unit (blue)
-12	90H6306	1	Cover - Rear, Storage Expansion Unit (red)
-13	86G7740	1	Cover - Rear Round
-14	46G3647	1	Cover - Left Side
-15	1621811	17	Screw, M4 (10mm)
-16	46G3648	1	Handle
-17	46G3542	1	Cover - Right Side
-18	1621811	17	Screw, M4 (10mm)
-19	46G3648	1	Handle
-20	NONUM	NP	Logo, AS/400 Advanced
-21	NONUM	NP	Logo, AS/400 Advanced Server
-22	46G3695	1	Bracket, Rear Storage Expansion Unit Mounting
-23	1622677	7	Screw (12mm)

Assembly 12: Final Assembly - FC 5077, 507x & 508x Expansion Towers

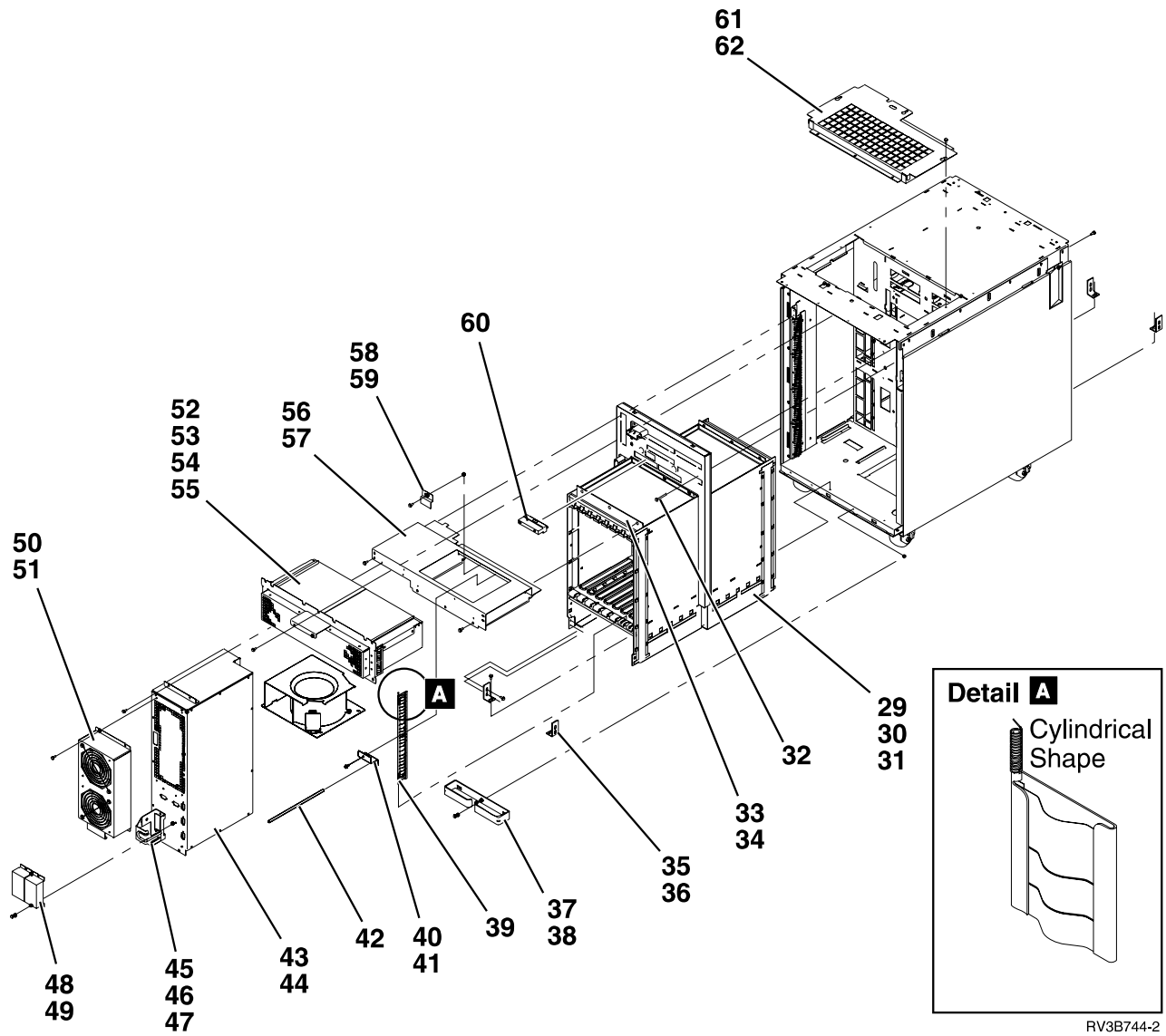


RV3B743-1

Assembly 12: (continued)

Asm-Index	Part Number	Units	Description
12-1	90H6285	1	Terminating Plug for FC 5070, 5072, 5080, 5082
-1	90H6285	1	Terminating Plug (TRM50) for FC 5071, 5073, 5081, 5083
-2	NONUM	NP	Cover, Terminating Plug
-3	1621811	1	Screw, M4 (10mm)
-4	87G6290	AR	Power Supply Asm (FC 5070, 5072, 5080, 5082)
-4	87G6110	AR	Power Supply Asm (FC 5071, 5073, 5081, 5083, 9251)
-4	86G7684	AR	Power Supply Filler Plate
-5	1621811	2	Screw, M4 (10mm)
-6	86G8020	1	Battery Power Unit Charger
-7	86G7750	1	External Battery Power Unit Charger Asm
-7	86G7685	AR	Battery Power Unit Filler Plate
-8	1621811	2	Screw, M4 (10mm)
-9	86G8040	1	Battery Power Unit
-10	46G3499	1	Shield - Power
-11	1621811	4	Screw, M4 (10mm)
-12	46G3500	1	Shield - Battery Power Unit
-13	86G7773	2	Clamp, External Battery Power Unit Charger Cable Asm
-14	1621812	3	Screw (8mm)
-15		AR	Removable Media (tape) See "Type, Model, and Part Number List" on page 750.
-15		AR	Optical Storage Unit (632x) See "Type, Model, and Part Number List" on page 750.
-16	86G7623	AR	Removable Media Filler Bezel
-17	86G7656	AR	Key - Tape Unit
-18	46G3700	AR	Removable Media Tray Asm
-18	46G3620	AR	Removable Media Tray Asm, Empty
-19	1621811	6	Screw, M4 (10mm)
-20	17G0574	NP	Secondary Control Panel
-21	1621811	2	Screw, M4 (10mm)
-22	86G7865	1	Filler Bezel Asm
-23	1621811	1	Screw, M4 (10mm)
-24	86G7714	1	External Battery Power Unit Battery Asm
-25	46G0321	1	External Battery Power Unit Battery Rear Cover Asm
-26	46G3529	AR	Filler Asm, Disk Unit
-27	87G4362	1	Disk Unit Guide Asm, (508x Only)
-28	1621811	8	Screw, M4 (10mm)
-29	87G6049	1	507x Expansion Regulator
-29	17G1209	1	508x Expansion Regulator

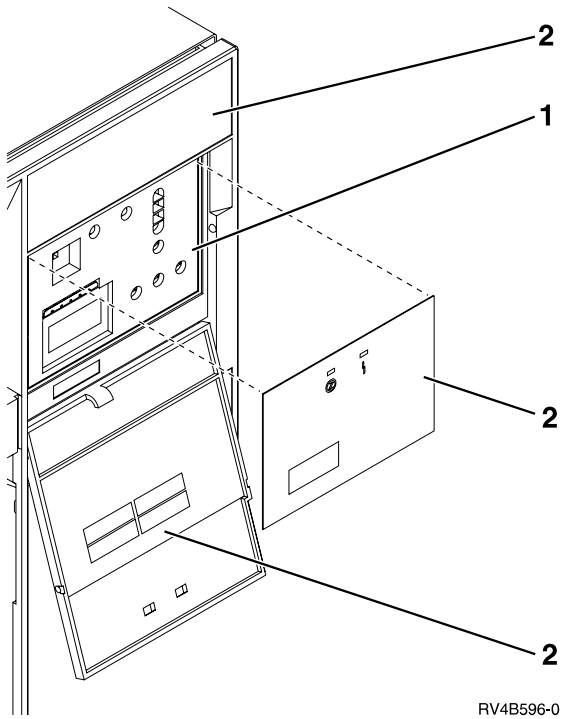
Assembly 12: (continued)



Assembly 12: (continued)

Asm- Index	Part Number	Units	Description
12-29	86G7633	1	Expansion Unit Card Enclosure Asm, Models 5070 and 5072 (lower)
-29	90H6425	1	Expansion Unit Card Enclosure Asm, Models 5071 and 5073 (lower)
-29	87G4357	1	Expansion Unit Card Enclosure Asm, Models 5080 and 5082 (lower)
-29	87G4362	1	Expansion Unit Card Enclosure Asm, Models 5080, 5081, 5082, and 5083 (upper)
-29	90H6426	1	Expansion Unit Card Enclosure Asm, Models 5081 and 5083 (lower)
-29	21H7465	1	Feature 9251 Base I/O Tower Card Enclosure Asm
-30	21H3759	AR	Enclosure Spring
-31	1621811	11	Screw, M4 (10mm)
-32	1621838	4	Screw (35mm)
-33	46G3646	2	Card Retaining Bar
-34	1621811	3	Screw, M4 (10mm)
-35	46G3663	4	Bracket, Cage Mounting
-36	1621811	12	Screw, M4 (10mm)
-37	46G3666	1	Bracket, Rear I/O cable ret.
-38	1621811	1	Screw, M4 (10mm)
-39	91H0250	AR	Card Spring (verticle SPD card separators)
-40	21H3473	1	Clamp, Light Pipe
-41	1621811	1	Screw, M4 (10mm)
-42	21H3472	1	Light Pipe
-43	87G6300	1	AC Module Asm (FC 5070, 5072, 5080, 5082)
-43	21H7697	1	AC Module Asm (FC 9251, 5071, 5073, 5081, 5083)
-44	1621811	4	Screw, M4 (10mm)
-45	NONUM	NP	Power Cord Retaining Bracket
-46	NONUM	NP	Power Cord Retaining Clamp
-47	NONUM	4	Screw, Torx M3 x 10 Lg
-48	90H6287	2	SPCN Optical Adapter Asm
-49	1621811	4	Screw, M4 (10mm)
-50	46G3510	1	AMD Asm - AC Module (AMD 1 and AMD2)
-51	1621811	4	Screw, M4 (10mm)
-52	46G3509	1	AMD Asm (AMD 3 and AMD 4)
-53	46G3587	2	• AMD
-54	1621811	4	• Screw, M4 (10mm)
-55	1621811	4	Screw, M4 (10mm)
-56	NONUM	NP	AMD Mounting Asm
-57	1621811	7	Screw, M4 (10mm)
-58	46G3667	1	Bracket - Term Ret
-59	1621811	1	Screw, M4 (10mm)
-60	NONUM	NP	Terminator/Redrive plug
-61	1621811	3	Screw, M4 (10mm)

Assembly 13: FC 5077, 507x, 508x Expansion Tower(s) Control Panel

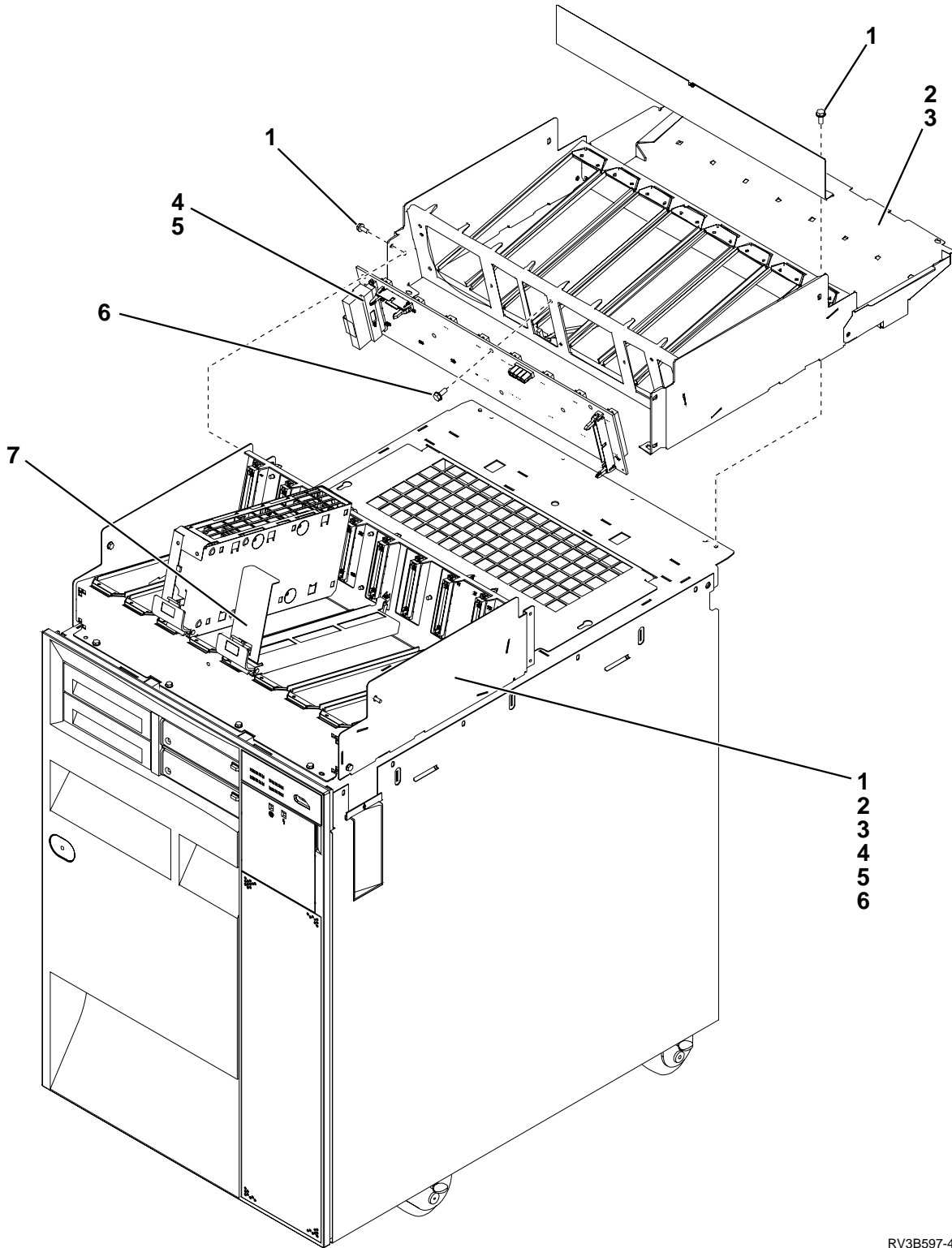


RV4B596-0

Assembly 13: (continued)

Asm- Index	Part Number	Units	Description
13-1	NONUM	NP	Control Panel
-	17G0574	1	Circuit Card
-2	46G3570	1	Control Panel Overlay

Assembly 14: Storage Expansion Unit Assembly



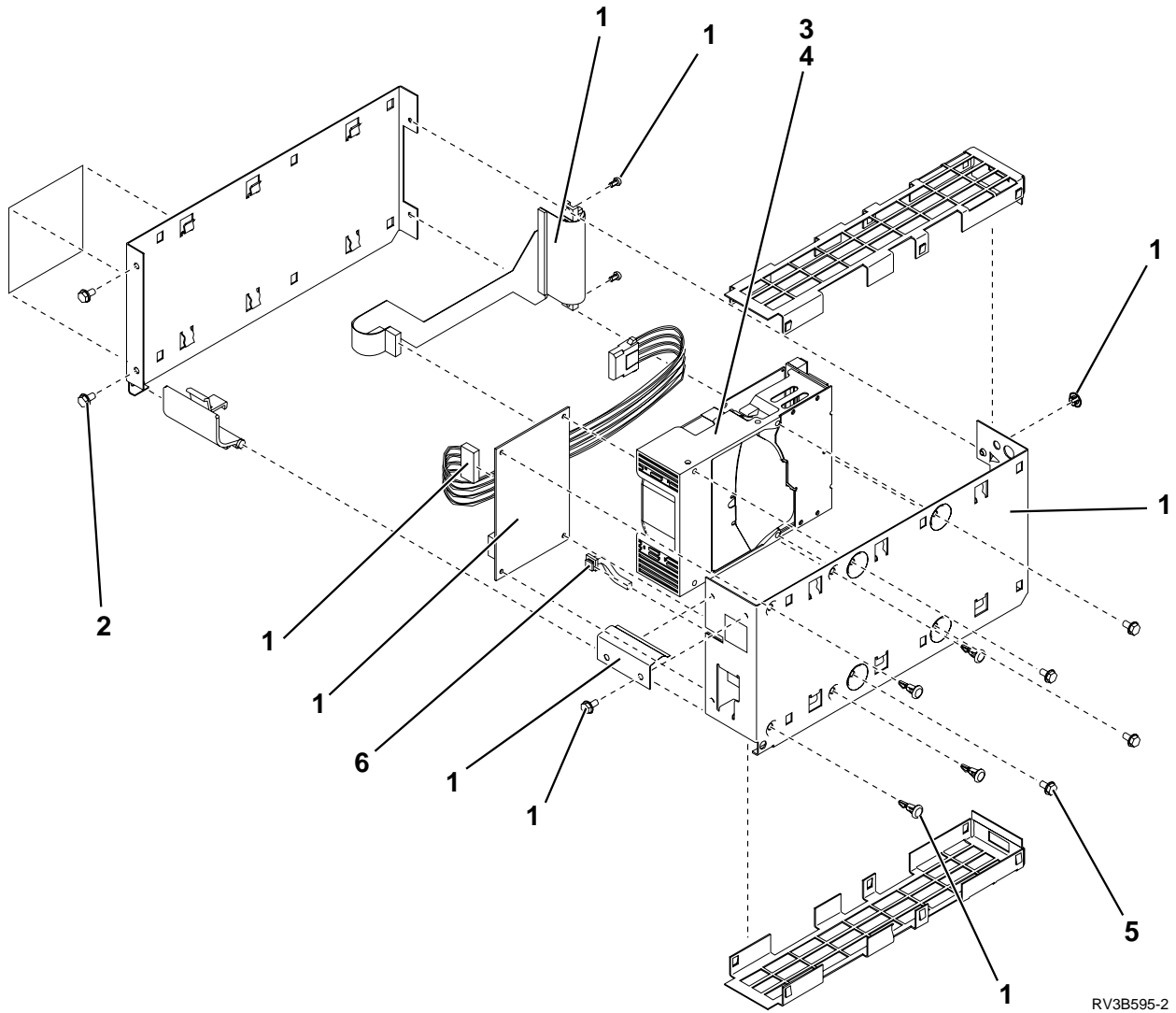
RV3B597-4

Asm-Index	Part Number	Units	Description
14-1	1621811	10	• Screw, M4 (10mm)

Assembly 14: (continued)

Asm- Index	Part Number	Units	Description
-2	46G3581	2	• Cover
-3	1621811	5	• Screw, M4 (10mm)
-4	16G6496	1	• Backplane (front) K1 - K8 FC 5052
-4	86G7872	1	• Backplane (rear) K9 - K16 FC 5052
-4	21H7750	1	• Backplane (front) K1 - K8 FC 5055
-4	21H6938	1	• Backplane (front) K1 - K8 FC 5058
-4	21H6940	1	• Backplane (front) K1 - K8 FC 5057
-4	21H6940	1	• Backplane (rear) K9 - K16 FC 5057 and 5058
-5	NONUM	AR	• Terminating Plug (See "DEVTERM" on page 568.)
-6	1621811	8	• Screw, M4 (10mm)
-7	46G3529	AR	• Disk Unit Filler Asm

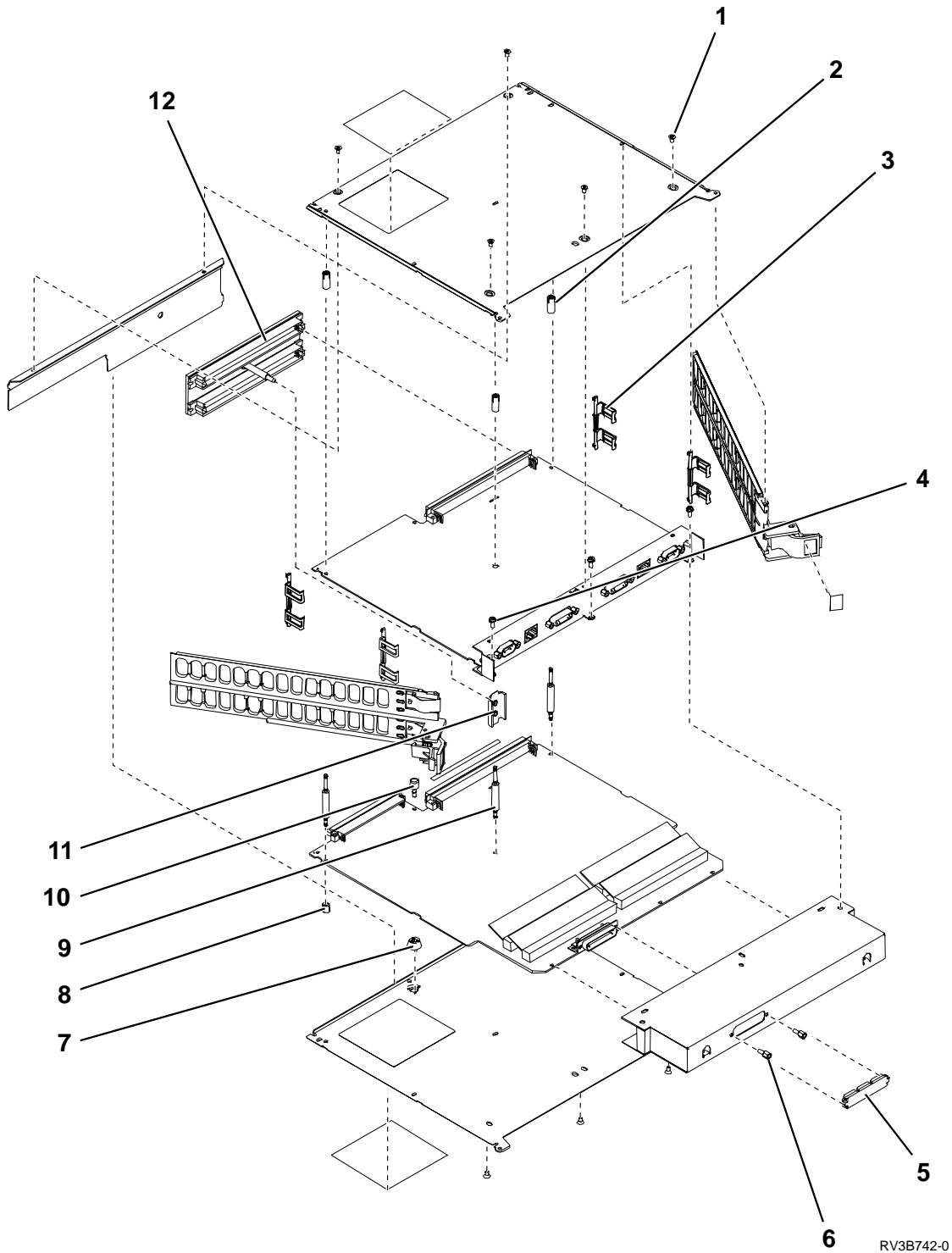
Assembly 15: Disk Unit Assemblies



Assembly 15: (continued)

Asm- Index	Part Number	Units	Description
15- -1 -2 -3 -4 -5 -6	NONUM NONUM 1621811 NONUM NONUM 60X8709 46G3530	NP AR 2 AR AR 4 1	Disk Unit Assembly • Tray Asm * • Screw, M4 (10mm) Thd-Form Hx Wshr Hd • Disk Drive * • • Disk Drive Logic Card * • • Screw (6mm) • Light Pipe * See "Disk Unit Type, Model, and Part Number List" on page 756 for part numbers for Tray Assembly and Disk Drives.

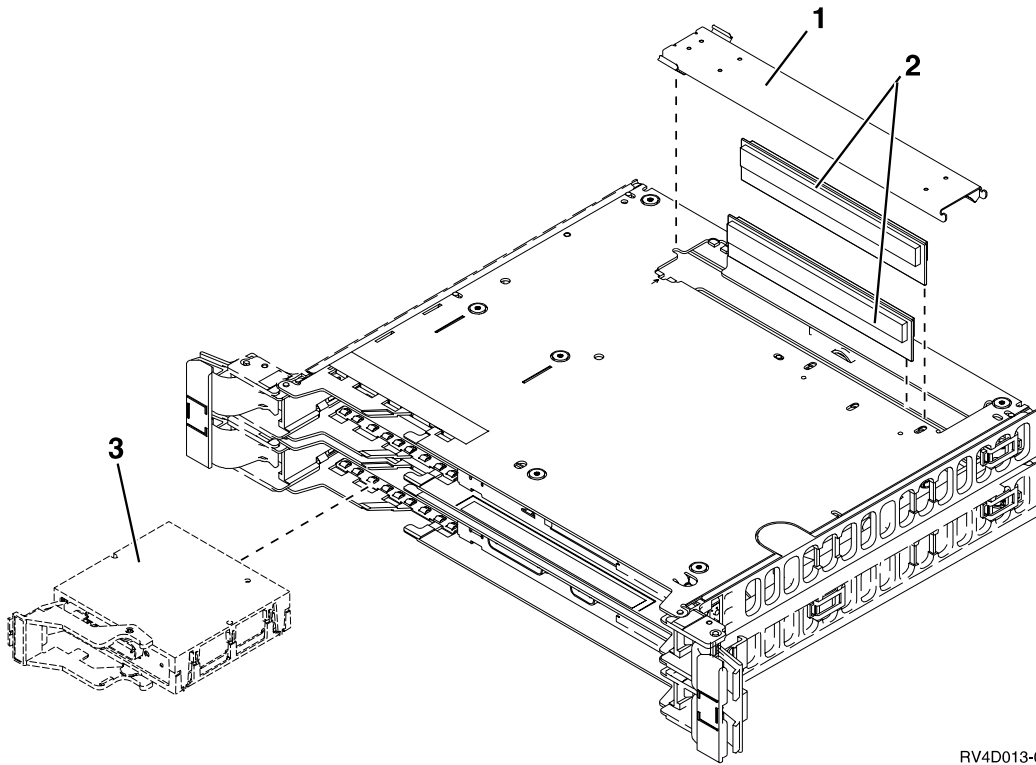
Assembly 16: File Server Book Assembly Type 6506



Assembly 16: (continued)

Asm- Index	Part Number	Units	Description
16-	NONUM	NP	File Server Book Asm
-1	21F9053	8	• Screw (4.5mm)
-2	86G7622	3	• Standoff, Right
-3	86G7619	4	• Rail Retainer
-4	21F4419	5	• Screw (6mm)
-5	17G2534	4	• Cover, Test Port
-6	72X6451	2	• Standoff
-7	86G7640	1	• Button, Card Support
-8	86G7621	3	• Standoff, Left
-9	86G7620	3	• Standoff, Middle
-10	86G7639	1	• Bow Clip Guide
-11	75G5716	1	• Stiffener, Docking
-12	86G7681	1	• Crossover Connector Asm

Assembly 17: File Server Book Assembly Type 6616

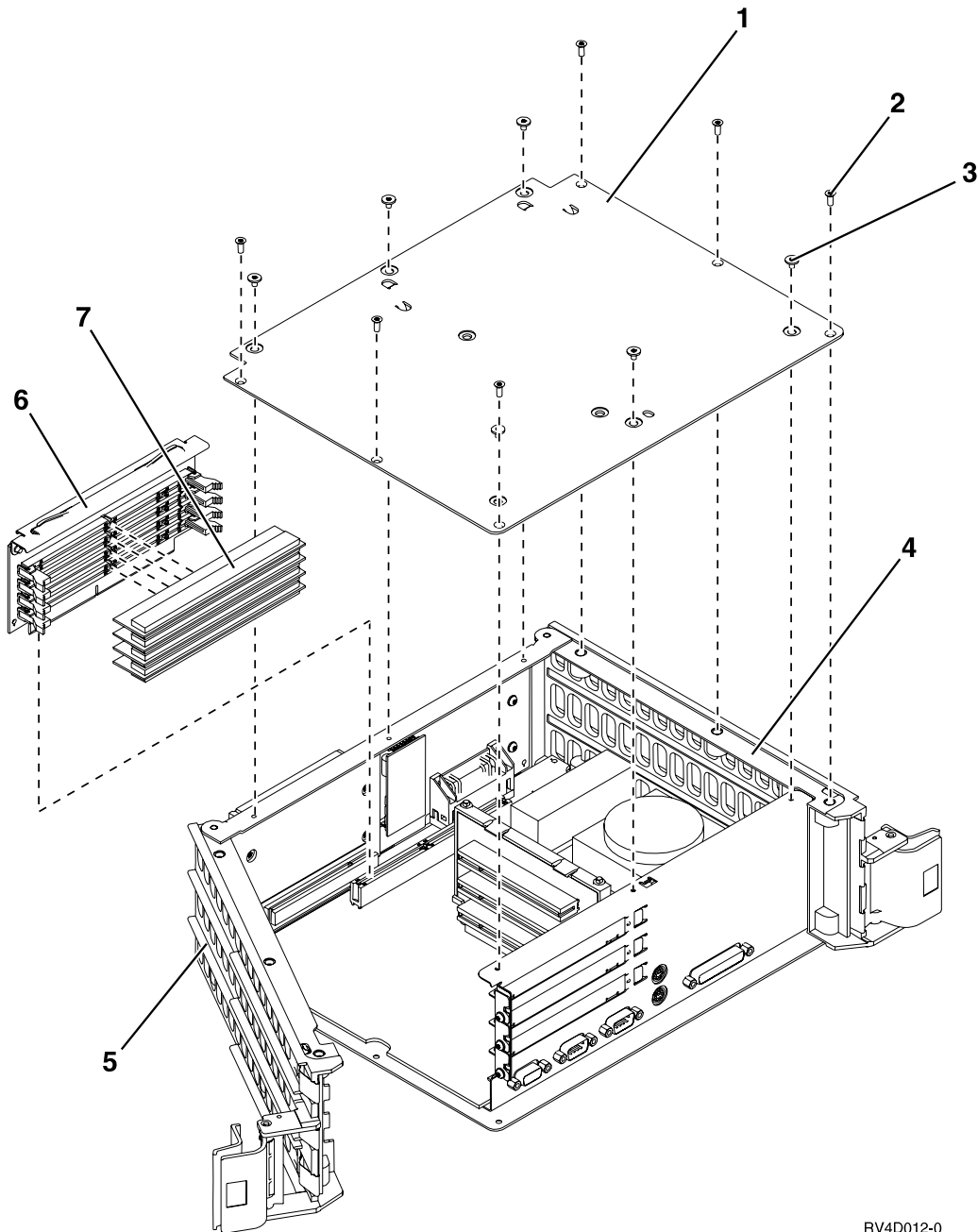


RV4D013-0

Assembly 17: (continued)

Asm- Index	Part Number	Units	Description
17-	91H0353	1	File Server Book Asm
-1	NONUM	1	• Access cover
-2	44H7558	1	• 32 MB Memory DIMM
-2	90H9075	1	• 128 MB Memory DIMM
-3	NONUM	1	• Adapter Card *
			* See "Type, Model, and Part Number List" on page 750 for part numbers for Adapter Card part numbers.

Assembly 18: File Server Book Assembly Type 6617



RV4D012-0

Asm-Index	Part Number	Units	Description
18-	97H7627	1	File Server Book Asm
-1	NONUM	1	• Access cover
-2	56F0346	6	• Cover screw (small, 3.35mm)
-3	21F9053	6	• Cover screw (large, 4.5mm)
-4	90H6464	1	• Lower rail
-5	90H6462	1	• Upper rail
-6	NONUM	1	• Riser for Memory DIMM
-7	44H7558	4	• 32 MB Memory DIMM
-7	90H9075	4	• 128 MB Memory DIMM
-7	97H7725	4	• 256 MB Memory DIMM

Cables and Miscellaneous

Note: A logical diagram of the power cable (PWRx) and signal cable (SIGx) connections can be found in “Expansion Tower Locations and Addresses” on page 687.

Assembly 19: Internal Cable Assemblies

Asm- Index	Part Number	Units	Description
19-	44H8029	1	SIG1, IOA to DASD L01 - L05
-	44H8031	1	SIG2, IOA to DASD F01 - F05
-	44H8031	1	SIG3, IOA to DASD F11 - F15
-	44H7835	1	SIG4A, DASD L01 - L05 to tape/Optical D01 - D02
-	44H8036	1	SIG4B, DASD L01 - L05 to tape/Optical D01 - D02
-	44H8017	1	SIG5A, CFIOF to panel
-	44H8021	1	SIG5B, CFIOF to panel
-	44H8035	1	SIG6B, SIG7 to panel/processor/power supply
-	44H8022	1	SIG6C, Panel to power supply
-	44H8027	1	SIG7, Internal UPS to SIG6B
-	44H8027	1	SIG7, Internal UPS to PWRBUS1x
-	44H8339	1	SIG8A, SPCN to System Expansion Frame — with cover interlock
-	87G0785	1	SIG8A, SPCN to System Expansion Frame — without cover interlock
-	44H8020	1	SIG8B, Jumper
-	44H8016	1	SIG9A, Panel to MI/UPS signal/power supply
-	44H8338	1	SIG9B, Panel to RPO/MI/UPS signal/SPCN/cover — with cover interlock
-	87G0784	1	SIG9B, Panel to RPO/MI/UPS signal/SPCN/cover — without cover interlock
-	NONUM	1	Interlock jumper
-	44H8026	1	SIG10, Tape/Optical to Manufacturing connector
-	44H8472	1	SIG12, Tower Card to SIG6B
-	44H8039	1	SIG15, MX bus System/expansion
-	44H8029	1	SIG21, BACKPL6 to DASD F31 - F35 SPD board
-	44H8031	1	SIG22, BACKPL6 to DASD F41 - F45 SPD board
-	44H8031	1	SIG23, BACKPL6 to DASD F51 - F55 SPD board
-	44H8029	1	SIG24A, BACKPL6 to tape D11 - D13 SPD board
-	44H8036	1	SIG24B, F31 - F35 to tape D11 - D13, PCI board
-	44H8037	1	SIG24C, F31 - F35 cable with terminator, PCI board (no tape backplane)
-	44H4541	1	SIG25, Optical bus card to rear system connectors
-	44H8400	1	PWRBUS1A
-	44H8401	1	PWRBUS1B
-	44H7910	1	PWRBUS1C
-	44H8272	1	PWR1A, Tape D01, DASD L01 - L05, F01 - F05, AMD
-	44H7808	1	PWR1B, Tape/Optical D01/D02, DASD L01 -L05, F01 - F05, AMD
-	44H8337	1	PWR1C, Tape/Optical, DASD L01 - L05, AMD
-	44H8424	1	PWR2A, Tower Card
-	44H7817	1	PWR2B, Tower Card
-	44H7809	1	PWR3A, Tower Card System PCI Board
-	44H7825	1	PWR3B, Tower Card System PCI Board
-	44H7811	1	PWR8, DASD F01 - F05, F11 - F15
-	44H8271	1	PWR9, DASD L01 - L05 to optical D02
-	44H8388	1	PWR11, UPS to PS power line cord
-	44H7812	1	PWR21, Tape D11 - D13, DASD F31 - F35, AMD
-	44H7815	1	PWR22, DASD F41 - F45, F51 - F55
-	44H7814	1	PWR23A, BACKPL6
-	44H7816	1	PWR23B, BACKPL7 Expansion PCI Board
-	44H7822	1	PWR25, Tower Card (3 times) SPD Board
-	44H7823	1	PWR26, BACKPL7 (4x) Expansion PCI Board
-	21H6941	1	PWR50, Card Enclosure to Storage Expansion Unit (Power)
-	21H6942	1	PWR51, Card Enclosure to Storage Expansion Unit (Power)

Assembly 19: (continued)

Asm-Index	Part Number	Units	Description
-	21H6982	1	PWR52, Card Enclosure to Storage Expansion Unit
-	97H7469	1	PWR60 (FC 5065 or 5066 Expansion Tower)
-	97H7483	1	PWR61 thru PWR64, PWR66 thru PWR69, and PWR71 thru PWR74 (FC 5065 or 5066 Expansion Tower)
-	97H7544	1	PWR65, PWR70 (FC 5065 or 5066 Expansion Tower)
-	97H7475	1	PWR75 (FC 5065 or 5066 Expansion Tower)
-	97H7474	1	PWR76 (FC 5065 or 5066 Expansion Tower)
-	36L8858	1	PWR77 thru PWR 79 (FC 5065 or 5066 Expansion Tower)
-	46G3520	1	SIG30A, Storage Expansion unit control panel cable (DLX)
-	46G3521	1	SIG30B, Expansion unit control panel cable
-	46G3524	1	SIG41, Card Enclosure to Storage Expansion Unit (Bus 2, Drives 5-8)
-	46G3523	1	SIG42, Card Enclosure to Storage Expansion Unit (Bus 0, Drives 1-4)
-	46G3787	1	SIG43, Card Enclosure to Storage Expansion Unit (Bus 1, Drives 9-16)
-	46G3527	1	SIG44A, Card Enclosure to Storage Expansion Unit (SPCN 1)
-	46G3525	1	SIG44B, Card Enclosure to Storage Expansion Unit (SPCN 2)
-	46G3525	1	SIG50, Card Enclosure to Storage Expansion Unit (SPCN 2)
-	21H6981	1	SIG51, Card Enclosure to Storage Expansion Unit (SCSI)
-	21H6983	1	SIG52, Card Enclosure to Storage Expansion Unit (SPCN)
-	46G3523	1	SIG53, Card Enclosure to Storage Expansion Unit (SCSI 0)
-	46G3524	1	SIG54, Card Enclosure to Storage Expansion Unit (SCSI 2)
-	46G3787	1	SIG55, Card Enclosure to Storage Expansion Unit
-	97H7481	1	SIG60, PCI Assembly to DB3 board (FC 506x Expansion Tower)
-	97H7484	1	SIG61, PCI Assembly to DB2 board (FC 506x Expansion Tower)
-	97H7484	1	SIG62, PCI Assembly to DB1 board (FC 506x Expansion Tower)
-	97H7473	1	SIG63, DB3 to Control Panel NB1 (FC 506x Expansion Tower)
-	24L0803	1	SIG64, PCI Assembly to Power Dist. board (FC 506x Expansion Tower) Includes part numbers 97H7476, 97H7477, and 97H7606
-	46G3528	1	PWR20A, Card Enclosure to Storage Expansion Unit (Power 1)
-	46G3524	1	PWR20B and 2, Card Enclosure to Storage Expansion Unit (Power 1 and 2)
-	21H6941	1	PWR50, Card Enclosure to Storage Expansion Unit
-	21H6942	1	PWR51, Card Enclosure to Storage Expansion Unit
-	21H6982	1	PWR52, Card Enclosure to Storage Expansion Unit
-	97H7469	1	PWR60 (FC 506x Expansion Tower)
-	97H7483	1	PWR61 thru PWR64, PWR66 thru PWR69, and PWR71 thru PWR74 (FC 506x Expansion Tower)
-	97H7544	1	PWR65, PWR70 (FC 506x Expansion Tower)
-	97H7475	1	PWR75 (FC 506x Expansion Tower)
-	97H7474	1	PWR76 (FC 506x Expansion Tower)
-	36L8858	1	PWR77 thru PWR 79 (FC 506x Expansion Tower)
-	90H6285	1	SCSI Terminating Plug for FC 5070, 5072, 5080, 5082

Assembly 19: (continued)

Asm- Index	Part Number	Units	Description
-	90H6285	1	TRM 50 Terminating Plug (TRM50) for System Units and FC 5071, 5073, 5081, 5083 Expansion Towers
-	87G6056	1	AC Box to AMD
-	87G6054	1	SPCN
-	75G5712	1	JTAG
-	75G6001	1	AMD 3 & 4
-	21H6972	3	SPD Backplane Power
-	21H6974	1	SIG30D, Control Panel
-	21H6976	1	Miscellaneous Signals #2
-	21H6977	1	Miscellaneous Signals #1
-	21H6978	1	SCIL #0
-	21H6979	1	SCIL #1
-	21H6980	1	JTAG
-	21H6984	1	Removable Media
-	21H6987	1	SPCN #1
-	21H6988	1	SPCN #2
-	21H6981	1	Storage Expansion Unit SCSI Cable
-	21H6982	1	Storage Expansion Unit power cable
-	21H6983	1	Storage Expansion Unit SPCN cable
-	21H6990	1	Miscellaneous, CEC to Active Backplane
-	21H6996	1	SIG30G, Control Panel to front tailgate
-	21H7376	1	Four Port SCIL to rear tailgate
-	21H7759	1	JTAG to rear tailgate
-	21H7760	1	SIG30F, Control Panel
-	21H7374	1	SIG30H, Control Panel, (Base I/O Attach)
-	21H7375	1	JTAG Base I/O Attach
-	21H7643	1	SCIL/RIO Base I/O Attach

Assembly 20: External Cable Assemblies

Asm- Index	Part Number	Units	Description
20-	21F5097	AR	ASCII, 6 m (20 feet) - 6-Port (9841)
-	59X3829	AR	ASCII, 6 m (20 feet) - 12-Port (9825)
-	59X3816	AR	ASCII, 3 m (10 feet) - 12-Port (9825)
-	21F4339	AR	ASCII, 6 m (20 feet)
-	21F4344	AR	ASCII, 12 m (40 feet)
-	21F9966	AR	ASCII, 6 m (20 feet) - PC to Modem
-	21F9036	AR	ASCII, 6 m (20 feet) - PC to ASCII
-	21F4405	AR	ASCII, Surge Suppress
-	59X3833	AR	Async, 6 m (20 feet) - Modem
-	21F2591	AR	Async, 6 m (20 feet) - Modem (Germany)
-	93X0185	AR	Async, 6 m (20 feet) - Modem (Japan)
-	46G0450	AR	Communication console, 6 m (20 feet) (Germany)
-	46G0479	AR	Communication console, 2.5 m (8 feet)
-	85F8109	AR	Cryptographic, 6 m (20 feet) (9848)
-	46G3658	AR	Diskette, 2.4 m (8 feet) (9890)
-	46G3585	AR	Diskette and Twinaxial, 2.4 m (8 feet) (9891)
-	86G7691	AR	Ethernet Cable (9025) for the Integrated Netfinity Server for AS/400 (IOP) Card
-	86G7712	1	External Battery Power Unit Cable (2.4 meters)
-	87G6236	AR	Fax, 10 m (32.8 feet) - US, Canada, Japan, Spain, Taiwan, Philippines
-	75G3803	AR	Fax, 10 m (32.8 feet) - France
-	75G3805	AR	Fax, 10 m (32.8 feet) - UK
-	75G3804	AR	Fax, 10 m (32.8 feet) - Germany
-	75G3802	AR	Fax, 10 m (32.8 feet) - Italy
-	75G3806	AR	Fax, 10 m (32.8 feet) - Sweden
-	75G3807	AR	Fax, 10 m (32.8 feet) - Australia
-	75G3808	AR	Fax, 10 m (32.8 feet) - Hong Kong
-	75G3809	AR	Fax, 10 m (32.8 feet) - Finland
-	75G3810	AR	Fax, 10 m (32.8 feet) - Netherlands
-	75G3811	AR	Fax, 10 m (32.8 feet) - Switzerland
-	75G3812	AR	Fax, 10 m (32.8 feet) - Denmark
-	21H4902	AR	Fax, 10 m (32.8 feet) - Austria
-	21H4903	AR	Fax, 10 m (32.8 feet) - Belgium
-	21H4904	AR	Fax, 10 m (32.8 feet) - South Africa
-	21H4905	AR	Fax, 10 m (32.8 feet) - Israel
-	62X3427	AR	I/O Bus Extension, 4 m (12 feet)
-	62X3428	AR	I/O Bus Extension, 8 m (26 feet)
-	54G3385	AR	I/O Bus Exp., 7 m (23 feet) - Optical (9893)
-	54G3386	AR	I/O Bus Exp., 13 m (42.6 feet) - Optical (9893)
-	54G3387	AR	I/O Bus Exp., 22 m (72.2 feet) - Optical (9893)
-	6495249	AR	IPI-3, 0.75 m (2.46 feet) (98xx)
-	6495250	AR	IPI-3, 2.5 m (8.2 feet) (9803)
-	6495252	AR	IPI-3, 4 m (13.1 feet) (9804)
-	6495251	AR	IPI-3, 6 m (19.7 feet) (9805)
-	6495253	AR	IPI-3, 0.6 m (9801)
-	6495254	AR	IPI-3, 1.5 m (4.92 feet) (9802)
-	6495255	AR	IPI-3, 10 m (32.8 feet) (9806)
-	6495256	AR	IPI-3, 20 m (65.6 feet) (9807)
-	6495257	AR	IPI-3, 30 m (98.4 feet) (9808)
-	6495258	AR	IPI-3, 40 m (131.2 feet) (9809)
-	6495264	AR	IPI-3, 60 m (196.8 feet) (9810)
-	6495275	AR	IPI-3, 30 m (98.4 feet) - Plenum (9811)

Assembly 20: (continued)

Asm- Index	Part Number	Units	Description
-	6495276	AR	IPI-3, 40 m (131.2 feet) - Plenum (9812)
-	6495277	AR	IPI-3, 60 m (196.8 feet) - Plenum (9813)
-	74F1663	AR	ISDN (9844)
-	21H5067	AR	ISDN - Canada
-	8191822	AR	ISDN - Euro
-	75G3980	AR	ISDN - New Zealand
-	17G2528	AR	ISDN - France (9844)
-	8191781	AR	ISDN - Switzerland (9844)
-	8191922	AR	ISDN - Euro NIA (9844)
-	22F0149	AR	EIA232, 6 m (20 feet) (9022)
-	22F0151	AR	EIA232, 6 m (20 feet) - Japan (9022)
-	22F0150	AR	EIA232, 6 m (20 feet) - Germany (9022)
-	21F9348	AR	EIA232, 15.6 m (50 feet) (9836)
-	21F9349	AR	EIA232, 15.6 m (50 feet) - Japan (9836)
-	21F9353	AR	EIA232, 15.6 m (50 feet) - Germany (9836)
-	72X5643	AR	RS366 (AUTOCALL), 6 m (20 feet) (9840)
-	21F4415	AR	RS366 (AUTOCALL), 6 m (20 feet) - Japan (9840)
-	21F4348	AR	RS422, 30 m (100 feet)
-	6495268	AR	SCSI, 4 m (12 feet) (9826)
-	6495269	AR	SCSI, 12 m (40 feet) (9827)
-	21F4980	AR	SCSI, 20 m (60 feet) (9846)
-	87G6235	AR	SPCN, 2 Meter (6.5 feet) - Frame to Frame (9206)
-	21F9469	AR	SPCN, 6 Meter (20 feet) - Frame to Frame (9219)
-	21F9358	AR	SPCN, 15 Meter (50 feet) - Frame to Frame (9213)
-	21F9359	AR	SPCN, 30 Meter (98 feet) - Frame to Frame (9214)
-	21F9360	AR	SPCN, 60 Meter (197 feet) - Frame to Frame (9215)
-	21F9412	AR	SPCN, 60 Meter (197 feet) - Optical (9211)
-	21F9415	AR	SPCN, 100 Meter - Optical (9212)
-	NONUM	AR	Tape signal cables. (See "EXTSCSI" on page 571.)
-	6339098	AR	Token-Ring LAN
-	72X5645	AR	Twinaxial, 4-Port 3 m (10 feet)
-	21F5093	AR	Twinaxial, 6 m (20 feet) - 8-Port Molded
-	21F8075	AR	Twinaxial Extender, 9 m (30 feet) - 8-Port only
-	4236482	AR	Twinaxial, 8 m (26.2 feet) - To First W/S Console
-	22F0152	AR	V.24 6 m (20 feet) (9023)
-	22F0154	AR	V.24 6 m (20 feet) - Japan (9023)
-	22F0153	AR	V.24 6 m (20 feet) - Germany (9023)
-	21F9350	AR	V.24 15.6 m (50 feet) (9835)
-	21F9351	AR	V.24 15.6 m (50 feet) - Japan (9835)
-	21F9352	AR	V.24 15.6 m (50 feet) - Germany (9835)
-	85F9396	AR	V.24 24.4 m (80 feet) - Japan
-	85F9397	AR	V.24 24.4 m (80 feet) - Germany
-	74F1837	AR	V.24 24.4 m (80 feet)
-	1749352	AR	V.35, French Stub
-	21F9357	AR	V.35 - 15.6 m (50 feet) (9838)
-	72X5641	AR	V.35 - 6 m (20 feet) (9020)
-	17G3991	AR	V.35 - 6 m (20 feet) (9879) for FC 2666
-	74F1839	AR	V.35 - 24.4 m (80 feet)
-	17G3992	AR	V.35 - 24.4 m (80 feet) (9880) for FC 2666
-	17G4000	AR	V.36/RS449 - 6 m (20 feet) (9882) for FC 2666
-	17G4001	AR	V.36/RS449 - 24.4 m (80 feet) (9883) for FC 2666*

Assembly 20: (continued)

Asm-Index	Part Number	Units	Description
-	17G4002	AR	V.36/RS449 - 45.7 m (150 feet) (9884) for FC 2666* (* looped clocking modem required)
-	21F9356	AR	X.21 - 15.6 m (50 feet) (9839)
-	72X5640	AR	X.21 - 6 m (20 feet) (9021)
-	17G3987	AR	X.21 - 6 m (20 feet) (9885) for FC 2666
-	21F9345	AR	2 Port Adapter Cable
-	21F9044	AR	4 m (13 feet) (9871) for FC 6500
-	21F9043	AR	2 m (6.5 feet) 2161 to 9427 — 6500 to 9337
-	21F9046	AR	1.5 m (5 feet) (9878) for FC 6501
-	56F0382	AR	6 m (20 feet) (9872) for FC 6500
-	21F9045	AR	20 m (60 feet) (9873) for FC 6500
-	21F9047	AR	4 m (13 feet) (9876) for FC 6501
-	56F0381	AR	6 m (20 feet) (9877) for FC 6501
-	21F9048	AR	24 m (78.8 feet) (9878) for FC 6501
-	62X3421	AR	370 Tape IOP Adapter (Dual 50-Pin to Bus/Tag)
-	6473029	AR	370 Tape IOP Adapter (78-Pin to Bus/Tag)
-	6473011	AR	370 Tape Internal Channel, 1.7 m (78-Pin to 78-Pin)
-	6473014	AR	370 Tape Internal Channel, 6.6 m (78-Pin to 78-Pin)
-	6473016	AR	370 Tape Internal Channel, 24.0 m (78-Pin to 78-Pin)
-	6473026	AR	370 Tape Device Adapter (Bus/Tag to 78-Pin, 3490E C Models Only)
			WAN SPD Cables
-	21H3764	AR	EIA232/V.24 cable 6.1 meter (20 feet)
-	21H3765	AR	EIA232/V.24 cable 6.1 meter (20 feet) - Germany
-	21H3766	AR	EIA232/V.24 cable 6.1 meter (20 feet) - Japan
-	21H3767	AR	EIA232/V.24 cable 15.2 meter (50 feet)
-	21H3768	AR	EIA232/V.24 cable 15.2 meter (50 feet) - Germany
-	21H3769	AR	EIA232/V.24 cable 15.2 meter (50 feet) - Japan
-	97H7389	AR	EIA232/V.24 cable 24.4 meter (80 feet)
-	97H7390	AR	EIA232/V.24 cable 24.4 meter (80 feet) - Germany
-	97H7391	AR	EIA232/V.24 cable 24.4 meter (80 feet) - Japan
-	21H3770	AR	V.24 cable 6.1 meter (20 feet)
-	21H3771	AR	V.24 cable 6.1 meter (20 feet) - Germany
-	21H3772	AR	V.24 cable 6.1 meter (20 feet) - Japan
-	21H3773	AR	V.24 cable 15.2 meter (50 feet)
-	21H3774	AR	V.24 cable 15.2 meter (50 feet) - Germany
-	21H3775	AR	V.24 cable 15.2 meter (50 feet) - Japan
-	21H3776	AR	V.24 cable 24.4 meter (80 feet)
-	21H3777	AR	V.24 cable 24.4 meter (80 feet) - Germany
-	21H3778	AR	V.24 cable 24.4 meter (80 feet) - Japan
-	21H3787	AR	V.36 cable 6.1 meter (20 feet)
-	21H3788	AR	V.36 cable 15.2 meter (50 feet)
-	21H3789	AR	V.36 cable 45.7 meter (150 feet)
-	21H3792	AR	V.35 cable 6.1 meter (20 feet)
-	21H3785	AR	V.35 cable 15.2 meter (50 feet)
-	21H3786	AR	V.35 cable 24.4 meter (80 feet)
-	21H3782	AR	X.21 cable 6.1 meter (20 feet)
-	21H3783	AR	X.21 cable 15.2 meter (50 feet)
-	21H3779	AR	Console cable 6.1 meter (20 feet)
-	21H7695	AR	Battery Backup Cable, 14.5 meter
-	21H7377	AR	RIO Cable, 15 meter
-	21H7643	AR	RIO Cable, 6 meter
-	97H7584	AR	Remote Control Panel cable (SAMI)

Assembly 21: Miscellaneous

Asm- Index	Part Number	Units	Description
21-	16G8095	AR	Control Panel Battery
-	21F9354	1	AA Card Wrap (T-pack)
-	72X6365	1	BB Card Wrap (universal)
-	74F1846	1	CC Card Wrap (Enet)
-	17G4124	1	DD Card Wrap (SDDI)
-	17G4138	1	EE Card Wrap (Fax)
-	17G4009	1	FF Card Wrap (High Speed)
-	92F9003	1	GG Card Wrap (FDDI)
-	23F5634	1	HH Card Wrap (Crypto)
-	6165899	1	II Card Wrap (TR lan)
-	86G7674	1	JJ Card Wrap (for FC 2723, 2724, 6149, 6181, 6510, and 6520)
-	21H6871	1	KK Card Wrap (WS)
-	21H3548	1	LL Card Wrap (ATM)
-	21H3547	1	MM Card Wrap (WS)
-	42H0540	1	NN Card Wrap (ATM)
-	45H2364	1	OO Card Wrap (WS PCI)
-	21H3760	1	PP Card Wrap (WAN SPD)
-	44H7479	1	QQ Card Wrap (WAN PCI)
-	90H6024	1	RR Card Wrap (PAR PORT)
-	21H4811	1	SS RJ45 Card Wrap (for FC 2810, 2838)
-	97H7749	1	UU Card Wrap (ISDN) (FC 2750)
-	97H7745	1	VV Card Wrap (ISDN) (FC 2751)
-	97H7754	1	WW Card Wrap (FC 2761)
-	16G5609	1	YY Card Wrap (FC 2743)
-	75G2725	1	Optical BUS Card Wrap/Terminator
-	59X3832	1	ASCII Cable Wrap
-	56F0307	1	ISDN Cable Wrap
-	81G3185	1	Optical Cable Wrap
-	97H7526	1	Optical Cable Wrap (When no ext. optical is used)
-	17G2641	1	EIA232 Cable Wrap
-	17G2642	1	ASYNC Cable Wrap
-	17G2643	1	RS366 Cable Wrap
-	17G2644	1	RS449 Cable Wrap
-	17G2645	1	V24 Cable Wrap
-	17G2646	1	X21 Cable Wrap
-	17G4103	1	X21HS Cable Wrap
-	17G2647	1	V35HS Cable Wrap
-	17G2648	1	V35 Cable Wrap
-	21H3761	1	V.24AD Cable Wrap
-	21H3762	1	EIA232AD Cable Wrap
-	21H3763	1	V35AD Cable Wrap
-	21H3790	1	RS449AD Cable Wrap
-	21H3791	1	X21AD Cable Wrap
-	21H6806	AR	Airflow Card Asm, Processor (263B)
-	21H6950	AR	Airflow Card Asm, Memory (263C)
-	46G3556	AR	Airflow Card Asm, Full (264A)
-	73F9384	AR	Airflow Card Asm, 1/2
-	75G3907	AR	Airflow Card Asm, 1/3
-	92G5190	AR	Antenna, Yagi directional
-	92G5195	AR	Antenna cable - 20ft. wireless
-	92G5196	AR	Antenna cable - 50ft. wireless

Assembly 21: (continued)

Asm-Index	Part Number	Units	Description
-	92G5194	AR	Antenna, directional 90 degrees
-	92G5192	AR	Antenna, omni-directional, 360 degrees
-	41F9970	AR	Cryptographic key pad, full function
-	82F5486	AR	Cryptographic key pad, limited function
-	92G5193	AR	2663 Hemispherical
-	92G5197	AR	2663 485 Balun with line terminator
-	71G9988	AR	Fax Coupler - US, Canada
-	71G9991	AR	Fax Coupler - France
-	71G9993	AR	Fax Coupler - UK
-	71G9992	AR	Fax Coupler - Germany
-	71G9989	AR	Fax Coupler - Japan
-	71G9990	AR	Fax Coupler - Italy
-	72G0002	AR	Fax Coupler - Spain
-	71G9994	AR	Fax Coupler - Sweden
-	71G9995	AR	Fax Coupler - Australia
-	60F0707	AR	Fax Coupler - Denmark
-	71G9996	AR	Fax Coupler - Hong Kong
-	71G9997	AR	Fax Coupler - Taiwan
-	71G9998	AR	Fax Coupler - Finland
-	71G9999	AR	Fax Coupler - Netherlands
-	72G0000	AR	Fax Coupler - Switzerland
-	72G0001	AR	Fax Coupler - Philippines
-			1/4-inch cartridge tapes
-	46G0298	AR	Adapter, 25 pin to 9 pin EIA232
-	82F0421	AR	2620 keypad reader
-	82F0422	AR	2628 keypad reader
-	16G8467	AR	Cleaning Cartridge, 8mm abrasive
-	16G8572	AR	Cleaning Cartridge (QIC-120 and QIC-525)
-	46G2674	AR	Cleaning Cartridge (QIC-1000, QIC-2GB, QIC-2GB (DC), QIC-4GB, QIC-5010) all countries
-	21F8586	AR	CE Test Tape, FC 6378 (QIC-525)
-	21F8734	AR	CE Test Tape, FC 6379
-	81F8902	AR	CE Test Tape 1.2SL (QIC-1000)
-	46G2660	AR	CE Test Tape, FC 7208 (8mm, off-line)
-	21F8577	AR	CE Test Tape (8mm, on-line)
-	16G8438	AR	CE Test Tape (QIC-2GB)
-	59H2677	AR	CE Test Tape (FC 7208 model 342)
-	59H3661	AR	CE Test Tape (QIC-4GB)
-	59H4127	AR	CE Test Tape (MLR3)
-	59H4463	AR	CE Test Tape (QIC5010, MLR1)

Power Cord Part Numbers and Receptacle Descriptions

Table 38. AS/400 System Power Cords and Receptacles

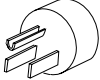





A - FC 5070, FC 5072, FC 5080, FC 5082 B ¹ - FC 503x D - FC 5077 E - FC 5081, FC 5083, FC 5071, FC 5073, FC 9251 F - FC 5065, FC 5066		
Plug	Receptacle	Countries
Type 4  125V 15A Part Number 86G7648 (6 ft) A 87G3880 (14 ft) A		<i>National Electrical Manufacturers Association</i> NEMA WD-1: 5-15P Antigua, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Curacao, Dominican Republic, El Salvador, Ecuador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Liberia, Mexico, Montserrat, Netherlands Antilles, Nicaragua, Panama, Philippines, St. Kitts, Taiwan, Tortola (BVI), Trinidad/Tobago, United States, Venezuela
Type 5  250V 15A Part Number 1838576 (6 ft) A E 14F1547 (6 ft) B F 1838573 (14 ft) A E F 14F1548 (14 ft) B		<i>National Electrical Manufacturers Association</i> NEMA WD-1: 6-15P Antigua, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Canada, Cayman Islands, Costa Rica, Curacao, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Montserrat, Netherlands Antilles, Nevis, Nicaragua, Panama, Philippines, St. Kitts, Taiwan, Thailand, Tortola (BVI), Trinidad/Tobago, Turks and Caicos Islands, United States, Venezuela
Type 6  250V 10A Part Number 13F9939 (6 ft) A E 13F9941 (14 ft) A E		<i>International Electrotechnical Commission</i> IEC 83-A5 Argentina, Australia, Brazil, Cape Verde Islands, Fiji Islands, New Zealand, Papua New Guinea, People's Republic of China, Western Samoa

Table 38. AS/400 System Power Cords and Receptacles (continued)







<p>A - FC 5070, FC 5072, FC 5080, FC 5082</p> <p>B¹ - FC 503x</p> <p>D - FC 5077</p> <p>E - FC 5081, FC 5083, FC 5071, FC 5073, FC 9251</p> <p>F - FC 5065, FC 5066</p>		
Plug	Receptacle	Countries
<p>Type 7</p>  <p>125V 15A Locking</p>		<p>National Electrical Manufacturers Association</p> <p>NEMA WD-1: L5-15P</p> <p>Canada, United States</p>
<p>Part Number</p> <p>86G7874 (6 ft) A</p> <p>87G3881 (14 ft) A</p>		
<p>Type 10</p>  <p>250V 15A Locking</p>		<p>National Electrical Manufacturers Association</p> <p>NEMA WD-5: L6-15P</p> <p>Canada, Columbia, Japan, Mexico, United States</p> <p>Note: Plug Type 10 supports models 15x, 17x, P0x, 2xx, 4xx, and 9910-080 in Colombia and Mexico. Plug Type 10 is not available in Canada, Japan, and the United States for these models.</p>
<p>Part Number</p> <p>14F1549 (6 ft) B</p> <p>14F1550 (14 ft) B</p> <p>86G7878 (6 ft) A E</p> <p>86G7879 (14 ft) A E</p>		
<p>Type 11</p>  <p>250V 20A Locking</p>		<p>NEMA WD-5: L6-20P</p> <p>Argentina, Cape Verde Islands</p> <p>F only: Canada, Japan, US</p>
<p>Part Number</p> <p>14F1553 (14 ft) B F</p> <p>07H0094 (6ft) F</p>		

Table 38. AS/400 System Power Cords and Receptacles (continued)

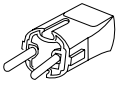



A - FC 5070, FC 5072, FC 5080, FC 5082 B ¹ - FC 503x D - FC 5077 E - FC 5081, FC 5083, FC 5071, FC 5073, FC 9251 F - FC 5065, FC 5066		
Plug	Receptacle	Countries
Type 18  250V 16A		<i>International Rule for the Approval of Electrical Equipment</i> CEE 7 VII Afghanistan, Albania, Algeria, Andorra, Angola, Armenia, Austria, Belarus, Belgium, Benin, Bosnia, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Congo, Croatia, Czech Republic, Djibouti, Egypt, Equatorial Guinea, Estonia, Finland, France, French Polynesia, French Guyana, Gabon, Georgia, Germany, Greece, Guadeloupe, Guinea, Guinea-Bissau, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Kazakhstan, Kirghizia, Laos, Latvia, Lebanon, Liberia, Lithuania, Luxembourg, Macau, Macedonia, Mali, Martinique, Mauritania, Moldavia, Monaco, Morocco, Mozambique, Netherlands, New Caledonia, Niger, North Korea, Norway, Paraguay, Peru, Poland, Portugal, Principe, Reunion, Romania, Russia, Rwanda, Sao Thome Island, Saudi Arabia, Senegal, Serbia, Slovenia, Slovakia, South Korea, Spain, Sudan, Suriname, Swaziland, Sweden, Syria, Tahiti, Togo, Tunisia, Turkey, Ukraine, Uruguay, Uzbekistan, Vietnam, Zaire, Zimbabwe
Part Number 13F9978 (6 ft) A E 13F9980 (14 ft) A E 14F1554 (14 ft) B F		
Type 19  250V 10A		<i>International Rule for the Approval of Electrical Equipment</i> CEE Denmark
Part Number 13F9996 (6 ft) A E 13F9998 (14 ft) A E		

Table 38. AS/400 System Power Cords and Receptacles (continued)







A - FC 5070, FC 5072, FC 5080, FC 5082 B ¹ - FC 503x D - FC 5077 E - FC 5081, FC 5083, FC 5071, FC 5073, FC 9251 F - FC 5065, FC 5066		
Plug	Receptacle	Countries
Type 22  250V 16A		<i>South African Bureau of Standards</i> SABS 164 BS 546 Bangladesh, Myanmar, Pakistan, South Africa, Sri Lanka
Part Number 14F0014 (6 ft) A E 14F0016 (14 ft) A E 14F1557 (14 ft) B F		
Type 23  250V 13A		<i>British Standards Institution</i> BS 1363A Abu Dhabi, Antigua, Bahrain, Botswana, Brunei, Cyprus, Dominica, Gambia, Ghana, Grenada, Grenadines, Guyana, Hong Kong, India, Iraq, Ireland, Jordan, Kenya, Kuwait, Lesotho, Malawi, Malaysia, Malta, Namibia, Nepal, Nigeria, Oman, Qatar, Sierra Leone, Singapore, St. Lucia, Tanzania, Uganda, United Arab Emirates, United Kingdom, Yemen, Zambia
Part Number 14F0032 (6 ft) A E 14F0034 (14 ft) A E 12J5988 (14 ft) B		
Type 24  250V 10A		<i>Schweizerischer Elektrotechnischer Verein</i> SEV 24507 Liechtenstein, Switzerland
Part Number 14F0050 (6 ft) A E 14F0052 (14 ft) A E		

Table 38. AS/400 System Power Cords and Receptacles (continued)

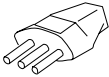



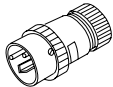

<p>A - FC 5070, FC 5072, FC 5080, FC 5082</p> <p>B¹ - FC 503x</p> <p>D - FC 5077</p> <p>E - FC 5081, FC 5083, FC 5071, FC 5073, FC 9251</p> <p>F - FC 5065, FC 5066</p>		
Plug	Receptacle	Countries
<p>Type 25</p>  <p>250V 10A/16A</p>		<p><i>Comitato Electrotecnico Italiano</i></p> <p>CEI 23-16</p> <p>Chile, Ethiopia, Italy, Libya, Somalia</p>
<p>Part Number</p> <p>14F0068 (6 ft) A E</p> <p>14F0070 (14 ft) A E</p> <p>14F1560 (14 ft) B F</p>		
<p>Type 32</p>  <p>250V 10A/16A</p>		<p><i>Standards Institution of Israel</i></p> <p>SII 32-1971</p> <p>Israel</p>
<p>Part Number</p> <p>14F0086 (6 ft) A E</p> <p>14F0088 (14 ft) A E</p> <p>14F1561 (14 ft) B F</p>		
<p>Type 34</p>  <p>250V 10A/15A Water Resistant</p>		<p><i>Manufacturer's Number Russel/Stoll</i></p> <p>Canada, Japan, United States</p>
<p>Part Number</p> <p>73F4931 (6 ft) A E</p> <p>73F4932 (14 ft) A E</p> <p>86F2646 (14 ft) B</p>		

Table 38. AS/400 System Power Cords and Receptacles (continued)

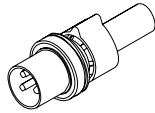

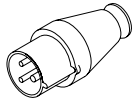

A - FC 5070, FC 5072, FC 5080, FC 5082 B ¹ - FC 503x D - FC 5077 E - FC 5081, FC 5083, FC 5071, FC 5073, FC 9251 F - FC 5065, FC 5066		
Plug	Receptacle	Countries
Type 40  250V 30A Water Resistant		<i>Manufacturer's Number Russel / Stoll</i> Plug 3750 (Duraguard 9R33U0W) Connector 3933 Receptacle 3753 Canada, United States
Part Number 46F4593 (6 ft) D 46F4594 (14 ft) D		
Type 46 (P+N+G)  250V 32A		<i>International Electrotechnical Commission</i> IEC 309 D : Abu Dubai, Albania, Algeria, Andorra, Angola, Armenia, Bahrain, Belarus, Belgium, Benin, Bosnia, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Congo, Croatia, Cyprus, Denmark, Djibouti, Dominica, Egypt, Equatorial Guinea, Ethiopia, France, French Guyana, French Polynesia, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Grenada, Grenadines, Guadeloupe, Guinea, Guinea-Bissau, Guyana, Hungary, Iceland, India, Iran, Iraq, Ireland, Italy, Ivory Coast, Jordan, Kazakhstan, Kenya, Kirghizia, Kuwait, Laos, Lesotho, Lebanon, Liberia, Libya, Liechtenstein, Luxembourg, Macau, Macedonia, Malawi, Mali, Malta, Martinique, Mauritania, Moldavia, Monaco, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Caledonia, Niger, Nigeria, Norway, Oman, Pakistan, Poland, Principe, Qatar, Reunion, Romania, Rwanda, Sao Thome Island, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, Somalia, Spain, St. Lucia, St. Vincent, Sudan, Swaziland, Switzerland, Syria, Tanzania, Togo, Tunisia, Uganda, Ukraine, United Arab Emirates, United Kingdom, Uzbekistan, Vietnam, Western Samoa, Yemen, Zaire, Zambia, Zimbabwe
Part Number 14F1555 (14 ft) B F		

Table 38. AS/400 System Power Cords and Receptacles (continued)

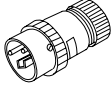



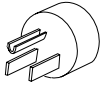



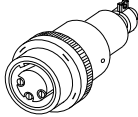

<p>A - FC 5070, FC 5072, FC 5080, FC 5082</p> <p>B¹ - FC 503x</p> <p>D - FC 5077</p> <p>E - FC 5081, FC 5083, FC 5071, FC 5073, FC 9251</p> <p>F - FC 5065, FC 5066</p>		
Plug	Receptacle	Countries
<p>Type 51</p>  <p>125V 13A/15A Water Resistant</p>		<p><i>Manufacturer's Number Russel/Stoll</i></p> <p>Plug 3720U-1</p> <p>Receptacle 3743U-1</p> <p>Inline 3913U-1</p> <p>Canada, United States</p>
<p>Part Number</p> <p>46F5893 (6 ft) A</p> <p>46F5894 (14 ft) A</p>		
<p>Type 54</p>  <p>250V 15A</p>		<p><i>International Electrotechnical Commission</i></p> <p>SAA-AS 3112</p> <p>Australia, Brazil, Fiji, New Zealand, Papua New Guinea, People's Republic of China, Western Samoa</p>
<p>Part Number</p> <p>14F1559 (14 ft) B F</p>		
<p>Type 59</p>  <p>125V 20A</p>		<p>JIS C-8303-1983</p> <p>Japan</p>
<p>Part Number</p> <p>34G0222 (6 ft) A</p> <p>34G0224 (14 ft) A</p>		

Table 38. AS/400 System Power Cords and Receptacles (continued)

A - FC 5070, FC 5072, FC 5080, FC 5082 B ¹ - FC 503x D - FC 5077 E - FC 5081, FC 5083, FC 5071, FC 5073, FC 9251 F - FC 5065, FC 5066		
Plug	Receptacle	Countries
Type KP  250V 30A		North Korea, South Korea
Part Number 87G6067 (14 ft) D		
Type PDL  250V 30A		Australia, Fiji, New Zealand, Papua New Guinea
Part Number 11F0106 (14 ft) D (Australia) 11F0107 (14 ft) D (New Zealand)		
Note: ¹ When connecting the power line cord to the FC 503x Expansion Towers, you must do the following to have a secure connection: <ul style="list-style-type: none"> • Ensure that the power cord is properly routed through the strain relief on the back of the system. • Ensure that the power cord is fully inserted in the power receptacle inlet on the back of the system unit. This may require another push with a minimum amount of force. 		

Chapter 6. Data Recovery Procedures and General System Information

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Recovery Procedures

Disk Service Support

This section contains the procedures and information to recover from disk unit failures with a minimum loss of customer data.

The procedures in this section do not give support to rack-mounted disk units such as an IBM 9337. For disk service support on rack-mounted disk units, use the *FC 504x Problem Analysis and Repair and Parts* information.

Start all service actions at “Start Disk Service Here” and follow the steps in the procedures to determine the following:

- The storage protection method that is used by the customer
- When and how to save customer data
- When to exchange a failing disk unit
- How to restore saved data
- How to resume storage protection

Start Disk Service Here

Before exchanging a disk unit, you must attempt to save customer data.

Recovery Procedures

This procedure directs you to the correct recovery procedure to use when attempting to save customer data.

1. Is the disk unit a type 673x?

No **Yes**

↓ Type 673x is a read cache which does **NOT** contain data that needs to be saved. Exchange the read cache using the disk unit procedure in “Chapter 4. Removal and Installation Procedures” on page 593.

Note: If you can get to a Dedicated Service Tools (DST) or System Service Tools (SST) screen use the concurrent maintenance procedure.

This ends the procedure.

2. Do you know if your system has storage protection for the failing disk unit?

Yes **No**

↓ Perform “Determining Storage Protection Status”. Then return here and continue with the next step of this procedure.

3. Does your system have mirrored protection for the failing disk unit?

No **Yes**

↓ Go to “Exchanging a Disk Unit with Mirrored Protection” on page 841.

This ends the procedure.

4. Does your system have device parity protection for the failing disk unit?

No **Yes**

↓ Go to “Exchanging a Disk Unit with Device Parity Protection” on page 840.

This ends the procedure.

5. Are you exchanging one of the following disk unit FRUs?

- Disk unit tray or holder

No **Yes**

↓ Exchange the failing FRU (see “Chapter 4. Removal and Installation Procedures” on page 593).

This ends the procedure.

6. You are exchanging the disk unit.

To save the data by copying to tape:

- Go to “Disk Unit Data Save and Initialize” on page 848.

To save the data by copying to another disk:

- Go to “Disk Unit Initialize and Disk to Disk Copy” on page 857.

This ends the procedure.

Determining Storage Protection Status

The customer should know if the system has storage protection configured on it. They should also have kept a printout of the storage protection configuration in the binder for the *Basic System Operation, Administration, and Problem Handling* information. If the customer does not know if the system has storage protection configured on it, **and** the system does not IPL to dedicated service tool (DST). Contact your next level of support. Otherwise, perform the following procedure.

Recovery Procedures

1. Select the *Work with disk units* option on the System Service Tools (SST) display. If you cannot get to SST, select DST (see “Accessing Dedicated Service Tools” in the *AS/400 Service Functions*).

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

Select the *Work with disk units* option on the Use Dedicated Service Tools (DST) display.

2. Select the *Display disk configuration* option on the Work with Disk Units display.
3. Select the *Display disk configuration status* option on the Work with Disk Configuration display.

A list of each auxiliary storage pool (ASP) displays, showing the disk units that are members of the ASP. The *Status* column shows one of the following protection statuses for the ASP:

Unprotected

Mirrored

- Disk units in an ASP with a protection status of *Mirrored* are configured for mirrored protection.

If the failing disk unit has mirrored protection, write down the status of the failing disk unit and its mirrored pair. You will need this information later in one of the recovery procedures.

- An ASP that has a status of *Unprotected* may contain disk units that are data parity protected. Look in the *Status* column of the *Display disk configuration status* display. The status column shows one of the following protection status:

- DPY/Active
- DPY/Failed
- DPY/HDW Failure
- DPY/Degraded
- DPY/Power Loss
- DPY/Not Ready
- DPY/Unknown

A unit with one of these statuses has data parity protection, only if all other units in the array are operational.

A unit with any other status does not have data parity protection. For example, a unit that does not have data parity protection may have a status of:

- DPY/Rebuild
- DPY/Unprotected

Examples:

- Suppose one unit has a status of DPY/Failed while all other units have a status of DPY/Unprotected. In this case, only the unit with the DPY/Failed status is protected. Servicing the failed unit will not result in data loss. Removing any of the unprotected units could result in data loss.
- If all units have a status of DPY/Active or DPY/Degraded, all units are protected. In this case, exchanging any unit will not result in data loss.

For more information about the meaning of a status for any unit, use the Help key as indicated on the display.

Recovery Procedures

Return to the procedure that sent you here.

This ends the procedure.

Exchanging a Disk Unit with Device Parity Protection

1. Does the failing unit have data parity protection that allows service without possible data loss (see "Determining Storage Protection Status" on page 838)?

Yes **No**

↓ Customer data may be lost if serviced. Ask your next level of support for assistance.

This ends the procedure.

2. Record the disk unit location for later use. If you do not already have the disk unit location information, use the location information in the Service Action Log if it is available. If the location is not available, find the address. See "SRC Address Formats" on page 878. Use the address to find the location. See "Expansion Tower Locations and Addresses" on page 687.

Exchange the failing disk unit (See "Chapter 4. Removal and Installation Procedures" on page 593 for the model or FC that you are working on and perform "Disk Unit - Concurrent"). When finished, continue with the next step of this procedure.

Note: If the concurrent procedure fails, go to step 5 of this procedure.

3. Perform the following:
 - a. Select System Service Tools (SST).
If you cannot get to SST, select dedicated service tool (DST) (see "Accessing Dedicated Service Tools" in the *AS/400 Service Functions*).

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

 - b. Select the *Work with disk units* option on the Service Tools display.
 - c. Select the *Work with disk unit recovery* option on the Work with Disk Units display.
 - d. Select the *Rebuild disk unit data* option.

Does the disk unit you just exchanged appear on the display as a unit that can be rebuilt?

Yes **No**

↓ It can take up to 5 minutes for the input-output processor (IOP) to report the device to the system. Keep trying the *Rebuild Disk Unit Data* option until the device is available. If the "Rebuild Disk Unit Data Failed" screen continues to appear even after 5 minutes, try a different disk unit or ask your next level of support for assistance.

4. Perform the following:
 - a. Select the disk unit on the display that was installed in place of the failing disk unit.
 - b. Rebuild the disk unit data. When the new disk unit is rebuilt, the display shows that the status is complete (this may take 30 minutes or longer).

Note: Once the rebuild has started, it is not necessary to wait to verify the array rebuild completes successfully.

- c. Return to the procedure that sent you here.

This ends the procedure.

5. Exchange the failing disk unit (see “Chapter 4. Removal and Installation Procedures” on page 593). When finished, continue with the next step of this procedure.
6. Perform the following:
 - a. Ask the customer to stop all active applications on the system and power the system off with the *Power Down System (PWRDWN SYS)* command.
 - b. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).
 - c. Select the *Work with disk units* option.
 - d. Select the *Work with disk unit recovery* option on the Work with Disk Units display.
 - e. Select the *Rebuild disk unit data* option.
 - f. Select the disk unit on the display that was installed in place of the failing disk unit.
 - g. Rebuild the disk unit data. When the new disk unit is rebuilt, the display shows that the status is complete (this may take 30 minutes or longer).
 - h. Press the Enter key after verifying that the status is complete.
7. Perform the following:
 - a. Return to the Use Dedicated Service Tools (DST) display.
 - b. Select the *Perform an IPL* option to complete the IPL.
8. Return to the procedure that sent you here.

This ends the procedure.

Exchanging a Disk Unit with Mirrored Protection

Definitions:

- Local load source - A disk used as the source for IPL data.

Primary Partition:

- For system models 270 and 820, this disk unit must be located in position D01, D02, D03, or D04.
- For system models 830, 840, SB2 and SB3, this disk unit must be located in position D31, D32, D33, or D34.

Secondary Partition:

- See “Locating a Secondary Partition’s Load Source From the Primary Partition’s Console” in the *AS/400 Service Functions* information.
- Remote load source - A load source disk unit that is not a local load source.

1. Display the disk unit status by performing the following:
 - a. Select system service tools (SST).

If you cannot get to SST, select dedicated service tools (DST) (see “Accessing Dedicated Service Tools” in the *AS/400 Service Functions*).

Note: If the customer is running applications on the system, do not power off the system or IPL the system to get to DST.

If you cannot get to SST or DST, and the system fails during the IPL to DST, the local load source disk unit may be in the wrong location or in a failed state. SRCB1xx4504 is displayed during the IPL to DST if a functional load source disk unit is failing or not in one of the positions indicated by the local load source definition above.

Recovery Procedures

Systems that have remote load source mirror protection can be recovered by using the steps in “Recover Remote Load Source” on page 864.

If you do know if this system has remote load source mirror protection, contact your next level of support.

- b. Select the *Work with disk units* option on the Service Tools display.
- c. Select the *Display disk configuration* option.
- d. Select the *Display disk configuration status* option.

Does the failing disk unit have a status of “Suspended”?

No **Yes**

↓ Go to step 16 of this procedure.

2. Does the disk unit that is mirrored to the failing disk unit have a status of “Suspended”?

Yes **No**

↓ Go to step 13 of this procedure.

3. Is the failing disk unit the load source (disk unit 1)?

Yes **No**

↓ Ask the customer to end all applications that are running on the system and power the system off with the *Power Down System (PWRDWNSYS)* command.

To save the data by copying to tape:

- Go to “Disk Unit Data Save and Initialize” on page 848.

To save the data by copying to another disk:

- Go to “Disk Unit Initialize and Disk to Disk Copy” on page 857.

4. Is the failing load source disk unit a local load source?

No **Yes**

↓ Ask the customer to end all applications that are running on the system and power the system off with the *Power Down System (PWRDWNSYS)* command.

To save the data by copying to tape:

- Go to “Disk Unit Data Save and Initialize” on page 848.

To save the data by copying to another disk:

- Go to “Disk Unit Initialize and Disk to Disk Copy” on page 857.

5. You are at this step because the remote load source is failing and the local load source has a state of Suspended.

Perform the following to attempt to repair the local load source. Doing this procedure reduces the duration of the repair time.

- a. Record the location of the local load source disk unit.
- b. Exchange the local load source disk unit using concurrent maintenance for the model or FC that you are working on (see “Chapter 4. Removal and Installation Procedures” on page 593).

Was the disk unit exchanged successfully using the concurrent maintenance procedure?

No **Yes**

↓ Go to step 8 of this procedure.

6. The following criteria was met which is why you are here:
- The concurrent repair of the local load source disk unit did not succeed.
 - The system has remote mirrored load source protection.

Ask the customer to stop all applications that are running on the system and power the system off with the *Power Down System (PWRDWN SYS)* command.

Was the local load source disk unit exchanged using the dedicated maintenance procedures?

No **Yes**

↓ Go to “Recover Remote Load Source” on page 864.

This ends the procedure.

7. Exchange the failing local load source disk unit by using the dedicated maintenance procedures for the model or FC that you are working on (see “Chapter 4. Removal and Installation Procedures” on page 593).

After exchanging the disk unit, go to “Recover Remote Load Source” on page 864.

This ends the procedure.

8. Did you exchange the disk unit?

Yes **No**

↓ You exchanged one of the following FRUs:

- Disk drive logic card
- Disk unit tray or holder

If mirrored protection does not start automatically, go to “Resuming Mirrored Protection” on page 847.

This ends the procedure.

9. Perform the following:

- a. Select System Service Tools (SST).

If you cannot get to SST, select DST (see “Accessing Dedicated Service Tools” in the *AS/400 Service Functions*).

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

- b. Select the *Work with disk units* option.
c. Select the *Display disk configuration* option.
d. Select the *Display non-configured units* option.

Does the disk unit that you just exchanged appear as a non-configured unit on the display?

Yes **No**

↓ It can take up to 5 minutes for the IOP to report the device to the system. Wait a few minutes. Then, press F5 to refresh the display. When the disk unit you just exchanged appears as a non-configured unit on the display, continue with the next step of this procedure.

10. Format and initialize the disk unit by doing the following:

- a. Select the *Work with disk units* option on the Service Tools display.

Recovery Procedures

- b. Select the *Work with disk unit recovery* option on the Work with Disk Units display.
 - c. Select the *Disk unit problem recovery procedures* option on the Work with Disk Unit Recovery display.
 - d. Select the *Initialize and format disk unit* option on the Disk Unit Problem Recovery Procedures display.
 - e. On the display, select the disk unit you just installed.
 - f. Initialize and format the 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).
11. Perform the following:
 - a. Return to the Work with Disk Unit Recovery display.
 - b. Select the *Replace configured unit* option on the Work with Disk Unit Recovery display.
 - c. Select the configured disk unit to exchange, on the Select Configured Unit to Replace display.
 - d. Select the replacement disk unit on the Select Replacement Unit display.
 12. Return to the procedure that sent you here.

This ends the procedure.
 13. Is the disk unit that is mirrored to the failing disk unit, missing?

Note: If a disk unit is missing, a note at the bottom of the display with an asterisk (*) indicates the unit missing from the configuration.

Yes No

↓ Go to step 15 of this procedure.

14. **Ensure that the customer is not running any jobs before continuing with this step of the procedure.**

Power off the system.
Go to "LIC-PIP11" on page 337 and use cause code 0002.
If you cannot determine why the unit is missing, contact your next level of support.
If you correct the missing disk unit problem, go to "Start Disk Service Here" on page 837 to locate and perform the correct recovery procedure.
This ends the procedure.
15. Does the disk unit that is mirrored to the failing disk unit have a status of "Active"?

No Yes

↓ Suspend mirrored protection on the failing disk unit by performing the following:

 - a. Return to the *Work with disk units* menu.
 - b. Select the *Work with disk unit recovery* option.
 - c. Select the *Suspend mirrored protection* option.
 - d. Follow the instructions on the display to suspend mirrored protection on the failing disk unit.
16. Record the disk unit location for later use.

Exchange the failing disk unit (see "Chapter 4. Removal and Installation Procedures" on page 593). When finished, continue with the next step of this procedure.

Note: If the concurrent procedure fails, go to step 22 of this procedure.

17. Did you exchange the disk unit?

Yes **No**

↓ You exchanged one of the following FRUs:

- Disk drive logic card
- Disk unit tray or holder

If mirrored protection does not start automatically, go to “Resuming Mirrored Protection” on page 847.

This ends the procedure.

18. Perform the following:

a. Select System Service Tools (SST).

If you cannot get to SST, select DST (see “Accessing Dedicated Service Tools” in the *AS/400 Service Functions*).

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

- b. Select the *Work with disk units* option.
- c. Select the *Display disk configuration* option.
- d. Select the *Display non-configured units* option.

Does the disk unit that you just exchanged appear as a non-configured unit on the display?

Yes **No**

↓ It can take up to 5 minutes for the IOP to report the device to the system. Wait a few minutes. Then, press F5 to refresh the display. When the disk unit you just exchanged appears as a non-configured unit on the display, continue with the next step of this procedure.

19. Format and initialize the disk unit by doing the following:

- a. Select the *Work with disk units* option on the Service Tools display.
- b. Select the *Work with disk unit recovery* option on the Work with Disk Units display.
- c. Select the *Disk unit problem recovery procedures* option on the Work with Disk Unit Recovery display.
- d. Select the *Initialize and format disk unit* option on the Disk Unit Problem Recovery Procedures display.
- e. On the display, select the disk unit you just installed.
- f. Initialize and format the 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).

20. Perform the following:

- a. Return to the Work with Disk Unit Recovery display.
- b. Select the *Replace configured unit* option on the Work with Disk Unit Recovery display.
- c. Select the configured disk unit that you are exchanging on the Select Configured Unit to Replace display.
- d. Select the replacement disk unit on the Select Replacement Unit display.

21. Return to the procedure that sent you here.

This ends the procedure.

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22. You are at this step because the disk unit-concurrent repair procedures did not work.

Is the failing disk unit the load source (disk unit 1)?

Yes **No**

↓ Go to step 27 of this procedure.

23. Is the failing disk unit a load source?

Yes **No**

↓ Go to step 27 of this procedure.

24. Is the disk unit that is mirrored to the failing disk unit also a local load source?

No **Yes**

↓ Go to step 27 of this procedure.

25. You are at this step because the system failure meets the following two conditions:

- A disk unit that is a local load source is failing.
- The disk unit that is mirrored to the failing disk unit is a remote load source.

26. You are at this step because **all** of the following are true:

- The local load source disk unit is failing.
- Concurrent maintenance procedures did not work.
- Remote load source protection started.

Ask the customer to end all applications that are running on the system and power the system off with the *Power Down System (PWRDWNSYS)* command.

Go to "Recover Remote Load Source" on page 864.

This ends the procedure.

27. Ask the customer to end all applications that are running on the system and power the system off with the *Power Down System (PWRDWNSYS)* command. Exchange the failing disk unit (see "Chapter 4. Removal and Installation Procedures" on page 593). When finished, continue with the next step of this procedure.

28. Perform an IPL to DST (see "Dedicated Service Tools (DST)" in the *AS/400 Service Functions* information).

Did you exchange the disk unit?

Yes **No**

↓ You exchanged one of the following FRUs:

- Disk drive logic card
- Disk unit tray or holder

Go to "Resuming Mirrored Protection" on page 847.

This ends the procedure.

29. Format and initialize the disk unit by doing the following:

- a. Select the *Work with disk units* option on the Use Dedicated Service Tools (DST) display.

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- b. Select the *Work with disk unit recovery* option on the Work with Disk Units display.
 - c. Select the *Disk unit problem recovery procedures* option on the Work with Disk Unit Recovery display.
 - d. Select the *Initialize and format disk unit* option on the Disk Unit Problem Recovery Procedures display.
 - e. On the display, select the disk unit you just installed.
 - f. Initialize and format the 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).
30. Perform the following:
- a. Return to the Work with Disk Unit Recovery display.
 - b. Select the *Replace configured unit* option on the Work with Disk Unit Recovery display.
 - c. Select the configured disk unit to exchange on the Select Configured Unit to Replace display.
 - d. Select the replacement disk unit on the Select Replacement Unit display.
31. Perform the following:
- a. Return to the Use Dedicated Service Tools (DST) display.
 - b. Select the *Perform an IPL* option to complete the IPL. The system copies data to the new disk unit during the IPL.
32. Return to the procedure that sent you here.
This ends the procedure.

Resuming Mirrored Protection

Use this procedure to resume mirrored protection on suspended disk units.

1. Select the *Work with disk units* option on the System Service Tools (system service tool (SST)) display or on the Use Dedicated Service Tools (DST) display.
2. Select the *Work with disk unit recovery* option on the Work with Disk Units display.
3. Select the *Resume mirrored protection* option on the Work with Disk Unit Recovery display.
4. On the Resume Mirrored Protection display, select the disk unit that you just replaced. It has a status of suspended.
5. Are you in SST?

No	Yes
↓	The disk unit that you selected will become active when the system is operational.

This ends the procedure.
6. Perform the following:
 - a. Return to the Use Dedicated Service Tools (DST) display.
 - b. Perform an IPL.

Note: The disk unit you selected becomes active during the IPL.

This ends the procedure.

Recovery Procedures

Disk Unit Data Save and Initialize

Note: To complete this procedure, you may need the latest set of Save System (SAVSYS) or SAVSTG tapes that were made before the problem occurred. You will also need three blank tapes.

1. Are you exchanging a disk unit because a disk unit failure caused system operations to stop completely?

Yes **No**

- ↓ You may be able to use the Remove Units from Configuration function of DST. This function allows you to move all data from the disk unit you want to exchange, to the other disk units in the same auxiliary storage pool (ASP).

Go to step 21 of this procedure.

2. Perform an IPL to dedicated service tool (DST) (see "Dedicated Service Tools (DST)" in the *AS/400 Service Functions* information).

Does the Use Dedicated Service Tools (DST) display appear?

Yes **No**

- ↓ If any messages regarding missing disk units appear, ignore the message and go to step 3 of this procedure.

Repeat this step.

If the same system reference code (SRC) occurs again, the customer data is not recoverable. Go to step 5 of this procedure.

If a different SRC occurs, use it to correct the problem (see "Chapter 2. Unit Reference Codes" on page 17).

This ends the procedure.

3. From the Use Dedicated Service Tools (DST) display, perform the following to save the customer data from the failing disk unit:

- a. Select the *Work with disk units* option.
- b. Select the *Work with disk unit recovery* option on the Work with Disk Units display.
- c. Select the *Save disk unit data* option on the Work with Disk Unit Recovery display.
- d. Select the disk unit that you want the data saved from on the Select Disk Unit Data to Save display.
Record the ASP of the disk unit you are saving.
If the disk unit is missing, you cannot save the customer data to tape at this time. Go to step 5 of this procedure.
- e. Install a tape in the tape unit.
- f. The Specify Volume Identifier prompt appears. Enter the volume identifier for the tape. Write down the tape volume identifier. You will use the tape volume identifier later in this procedure.
- g. The Select Tape Unit prompt appears.
Select the tape unit that you loaded with a tape.

Note: If the tape volume identifier you entered does not match the tape volume identifier on the tape you loaded, the Device Intervention Required prompt appears. The message "Wrong volume loaded"

Recovery Procedures

appears at the bottom of the display. Select the Format option and press the Enter key to continue the save operation.

The Function Status display shows the percent of disk data saved.

- h. If the tape is full, the Device Intervention display appears. The message "Load next volume" appears at the bottom of the display.
 - 1) Insert the next tape into the tape unit.
 - 2) Select the option to retry and press the Enter key to continue the save operation.
- i. Continue saving the disk unit data until the status of the save is complete.

Customer data is not recoverable if one of the following occurs:

- The copy operation does not complete.
- There is a large number of unreadable pages to copy from the disk unit.

Continue with the next step of this procedure.

4. Does the display show that the status of the save is complete?

No **Yes**

↓ Perform the following:

- a. Power off the system.
- b. Exchange the failing disk unit (see "Chapter 4. Removal and Installation Procedures" on page 593).
- c. Go to step 8 of this procedure.

5. Have you already exchanged the disk drive logic card?

Yes **No**

↓ Perform the following to attempt to save the customer's data :

- a. Power off the system.
- b. Remove the disk unit (see "Chapter 4. Removal and Installation Procedures" on page 593).
- c. Exchange the failing disk drive logic card (see the instructions that come with the card). If you do not know the part number of the disk drive logic card, see "Disk Unit Type, Model, and Part Number List" on page 756. Locate the type and level of the disk drive to find the part number of the disk drive logic card.
- d. Go to step 2 of this procedure.

6. Have you already exchanged the storage IOA?

Yes **No**

↓ Perform the following:

- a. Power off the system.
- b. Exchange the storage IOA. If the storage IOA is integrated into the IOP, replace the IOP (see "Chapter 4. Removal and Installation Procedures" on page 593). If you do not know the part number, see "Type, Model, and Part Number List" on page 750.
- c. Perform an IPL to dedicated service tools (DST) (see "Dedicated Service Tools (DST)" in the *AS/400 Service Functions* information). If the same SRC occurs, go to step 7 on page 850 of this procedure. If a different SRC occurs, use it to correct the problem (see "Chapter 2. Unit Reference Codes" on page 17). If no SRC occurs, then the problem was solved by exchanging the IOA.

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This ends the procedure.

7. Perform the following:
 - a. Power off the system.
 - b. Exchange the failing disk unit (see “Chapter 4. Removal and Installation Procedures” on page 593).
8. Did you just exchange disk unit 1 in the system unit?
No Yes
↓ Go to step 12 of this procedure.
9. Format and initialize the new disk unit by doing the following:
 - a. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).
If any messages regarding missing disk units appear, ignore the message.
 - b. Select the *Work with disk units* option on the Use Dedicated Service Tools (DST) display.
 - c. Select the *Work with disk unit recovery* option on the Work with Disk Unit display.
 - d. Select the *Disk unit problem recovery procedures* option on the Work with Disk Unit Recovery display.
 - e. Select the *Initialize and format disk unit* option on the Disk Unit Problem Recovery Procedures display.
 - f. Select the disk unit on the display to initialize and format.
 - g. Press the F10 key on the confirmation display.
 - h. The system format and initializes the new disk unit. The display shows when the status is complete (this may take 30 minutes or longer).
10. Is most of the customer data recoverable (see step 3 of this procedure)?
Yes No
↓ Go to step 19 of this procedure.
11. Restore the customer data from the tape to the new disk unit by doing the following:
 - a. Return to the Work With Disk Unit Recovery display.
 - b. Select the *Restore disk unit data* option from the Work with Disk Unit Recovery display.
 - c. Enter the tape volume identifier. This is the volume identifier that you entered during the save procedure.
 - d. Install the first tape that the data was saved to in the tape unit.
 - e. Select the tape unit that you want the data restored from on the Select Tape Unit display.
 - f. Select the disk unit that you want the data restored to on the Restore Disk Unit Data display.
 - g. Press F10 to confirm the restore.
The Function Status display shows the percent of customer data restored. The system will IPL to the *Use Dedicated Service Tools (DST)* display when the restore has completed.

Note: Any damaged objects that were restored must be loaded again by the customer (have the customer see the *Backup and Recovery* information).

The system is ready for the next IPL.

This ends the procedure.

12. Is the customer data recoverable (see step 3 of this procedure)?

Yes **No**

↓ Go to step 16 of this procedure.

13. Perform an IPL from removable media and select the option to install Licensed Internal Code and restore disk unit data. (See "Installing Licensed Internal Code" in the *AS/400 Service Functions* information, which performs an IPL and installs the Licensed Internal Code.)

14. Did you get a Disk Configuration Error Report with a "Unit has incorrect logical partition configuration" warning?

No **Yes**

↓ You have logical partitions that need to be recovered before you can continue with this disk unit recovery procedure. Perform the following:

- a. Enter the Use Dedicated Service Tools (DST) option from the IPL or Install the System display.
- b. Enter the password 22222222.

Note: If this password is not valid, ask the customer for the correct password.

- c. Select the Work with system partitions option on the Use Dedicated Service Tools (DST) display.
- d. Select the Recover configuration data option on the Work with System Partitions display.
- e. Select the Recover primary partition configuration data on the Recover Configuration Data display.
- f. Review the information on the Select Disk Unit for Configuration Data Recovery display. Select the disk unit with the most recent date and correct system serial number and press enter. The system automatically copies the configuration data to the primary partition's load source, and performs an IPL.

Continue with the next step of this procedure.

15. Restore the customer data from the tape to the new disk unit by doing the following:

- a. Enter the *Use Dedicated Service Tools (DST)* option from the IPL or Install the System display.
- b. Enter the password 22222222.

Note: If this password is not valid, ask the customer for the correct password.

- c. Select the *Work with disk units* option on the Use Dedicated Service Tools (DST) display.
- d. Select the *Work with disk unit recovery* option on the Work with Disk Unit display.
- e. Select the *Restore disk unit data* option on the Work with Disk Unit Recovery display.

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- f. Enter the tape volume identifier. This is the volume identifier that you entered during the save procedure.
- g. Install the first tape that the data was saved to in the tape unit.
- h. Select the tape unit that you want the data restored from on the Select Tape Unit display.
- i. Select the disk unit that you want the data restored to on the Restore Disk Unit Data display.
- j. Press F10 to confirm the restore.

The Function Status display shows the percent of customer data restored.

Note: When the load-source disk is restored, the system automatically performs an IPL to the Use Dedicated Service Tools (DST) display. This occurs after the restore operation completes.

When all customer data from the tape to the disk restores successfully, the display shows that the status of the restore operation is complete.

- k. Press the Enter key to complete the restore operation.
- l. Power off the system.

Note: Any damaged objects that were restored must be loaded again by the customer (have the customer see the *Backup and Recovery* information).

The system is ready for the next IPL.

This ends the procedure.

16. Perform an IPL from removable media and select the option to install Licensed Internal Code and recover configuration. (See "Installing Licensed Internal Code" in the *AS/400 Service Functions* information, which performs an IPL and installs the Licensed Internal Code.)
17. Did you get a Disk Configuration Error Report with a "Unit has incorrect logical partition configuration" warning?

No **Yes**

↓ You have logical partitions that need to be recovered before you can continue with this disk unit recovery procedure. Perform the following:

- a. Enter the Use Dedicated Service Tools (DST) option from the IPL or Install the System display.
- b. Enter the password 22222222.

Note: If this password is not valid, ask the customer for the correct password.

- c. Select the Work with system partitions option on the Use Dedicated Service Tools (DST) display.
- d. Select the Recover configuration data option on the Work with System Partitions display.
- e. Select the Recover primary partition configuration data on the Recover Configuration Data display.
- f. Review the information on the Select Disk Unit for Configuration Data Recovery display. Select the disk unit with the most recent date and correct system serial number and press enter. The system

automatically copies the configuration data to the primary partition's load source, and performs an IPL.

Continue with the next step of this procedure.

18. The system ASP will be cleared because customer data was not recoverable. Recover the configuration to disk unit 1 in the system unit by doing the following:

- a. Enter the *Use Dedicated Service Tools (DST)* option from the IPL or Install the System display.
- b. Enter the password 22222222.

Note: If this password is not valid, ask the customer for the correct password.

- c. Select the *Work with disk units* option on the Use Dedicated Service Tools (DST) display.
- d. Select the *Work with disk unit recovery* option on the Work with Disk Unit display.
- e. Select the *Recover configuration* option on the Work with Disk Unit Recovery display. This option assembles the system configuration information on disk unit 1 in the system unit.

Notes:

- 1) A warning message appears stating that recovering the configuration destroys all system data.
 - 2) If you have a system with only one disk unit, a message may appear stating that your request to recover the configuration was not successful. The recover configuration function cannot be performed on a system with only one disk unit. Continue with the next step of this procedure.
- f. Go to step 20 of this procedure.
19. Because the disk data was not recoverable, clear the auxiliary storage pool (ASP) to which the disk unit is assigned by doing the following:
- a. Return to the Work with Disk Units display.
 - b. Select the *Work with disk configuration* option.
 - c. Select the *Work with ASP configuration* option.
 - d. Select the *Delete ASP data* option.
 - e. Enter the *Delete* option for the ASP you recorded in step 3 of this procedure.
 - f. Confirm the Delete ASP Data.
 - g. Return to the Work with Disk Units display.
 - h. Select the *Work with disk unit recovery* option.
 - i. Select the *Replace configured unit* option.
 - j. Select the configured disk unit to exchange on the Select Configured Unit to Replace display.
 - k. Select the replacement disk unit on the Select Replacement Unit display.
 - l. Press the Enter key to confirm the replace operation (this operation takes 10 to 15 minutes to complete).

Attention: The auxiliary storage pool to which the disk unit is assigned is erased. The customer must restore the data to the auxiliary storage pool (have the customer see the *Backup and Recovery* information).

Recovery Procedures

20. The ASP to which the failing disk unit was assigned is cleared. The customer should do the following:
 - If the disk unit you exchanged is in ASP 1, have the customer see the *Backup and Recovery* information. The customer must restore the operating system (OS/400 Licensed Program) and all customer data.
 - If the disk unit is in a user ASP (ASP 2 through ASP 16), data in the ASP is lost. See the *Backup and Recovery* information.

This ends the procedure.

21. The remaining steps of this procedure require a dedicated system.
Have the customer do a normal power-off procedure of the system.
22. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).
Is the IPL or Install the System display shown, or is DST available?
Yes No
↓ Go to step 2 of this procedure.
23. Select the *Use dedicated service tools (DST)* option on the display or use a function key. You need the customer password to get to the Use Dedicated Service Tools (DST) display.
24. Perform the following:
 - a. On the Use Dedicated Service Tools (DST) display, select the *Work with disk units* option.
 - b. Select the *Work with disk configuration* option.
 - c. Select the *Display disk configuration* option.
 - d. Select the *Display disk configuration status* option.
 - e. Record the ASP, unit, serial number, type, and resource name of the disk unit.
 - f. On the Display Disk Configuration Status display, ensure the following:
 - The disk unit is not the load-source disk unit (disk unit 1).
 - No disk units are missing from the configuration.

Note: An asterisk (*) next to the unit number indicates a missing unit.

- The status field of the disk unit to be removed shows *Configured*.

Are all these conditions true?

Yes No

- ↓ You cannot use the Remove Units from Configuration function.
Go to step 2 of this procedure.

25. Perform the following:
 - a. Return to the Display Disk Configuration display.
 - b. Select the *Display disk configuration capacity* option.Does the % *Used* field for the disk unit to be removed show an asterisk (*)?

No Yes

- ↓ You cannot use the Remove Units from Configuration function.
Go to step 2 of this procedure.

26. Return to the Work with Disk Units display.
27. Perform the following:

Recovery Procedures

- a. On the Work with Disk Units display, select the *Work with disk unit recovery* option.
- b. Select the *Disk unit problem recovery procedures* option.
- c. Select the *Analyze disk unit surface* option.
- d. Select the disk unit to analyze.
- e. Press F10 to analyze the disk unit surface.
- f. Wait until the Analyze function is complete.

Note: This takes several minutes.

Is the number of pages with errors zero?

Yes **No**

↓ You cannot use the Remove Units from Configuration function.

Go to step 2 of this procedure.

28. Return to the Work with Disk Units display.

29. Perform the following:

- a. On the Work with Disk Units display, select the *Work with disk configuration* option.
- b. Select the *Work with ASP configuration* option.
- c. Select the *Remove units from configuration* option.
- d. Select the disk unit to be removed.

Note: If the disk unit does not display, go to step 2 of this procedure.

- e. If the Confirm Continuation display appears, press the Enter key to continue. Wait for the next display.
- f. If there is enough storage in the ASP, the Confirm Remove Disk Units display appears. If there is not enough storage, an error message display appears.

Does any error message display appear?

No **Yes**

↓ Go to step 2 of this procedure.

30. Press the Enter key to verify the Remove Disk Units function.

The Remove Disk Units function takes several minutes. When it is complete, a message appears stating whether it was successful.

Was the Remove Disk Units function successful?

Yes **No**

↓ Go to step 2 of this procedure.

31. On the Work with ASP Configuration display, select the *Display disk configuration capacity* option.

32. Press F11 twice to display non-configured units.

Is the unit you removed shown as a non-configured unit?

Yes **No**

↓ Go to step 2 of this procedure.

33. Do you want to exchange the disk unit now?

Recovery Procedures

Note: You can exchange the disk unit at a later time because the disk unit is removed from the configuration.

Yes No

↓ **This ends the procedure.**

34. Perform the following:
 - a. Power off the system.
 - b. Exchange the failing disk unit (see “Chapter 4. Removal and Installation Procedures” on page 593).
35. Format and initialize the new disk unit by doing the following:
 - a. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).
 - b. Select the *Work with disk units* option on the Use Dedicated Service Tools (DST) display.
 - c. Select the *Work with disk unit recovery* option on the Work with Disk Unit display.
 - d. Select the *Disk unit problem recovery procedures* option on the Work with Disk Unit Recovery display.
 - e. Select the *Initialize and format disk unit* option on the Disk Unit Problem Recovery Procedures display.
 - f. Select the disk unit on the display to initialize and format.
 - g. Press the F10 key on the confirmation display.
 - h. The system initializes and formats the new disk unit. The display shows when the status is complete (this may take 30 minutes or longer).
36. In this step, you use the ASP, unit, serial number, type, and resource name information you recorded in step 24 of this procedure.

Perform the following:

 - a. Return to the Work with Disk Units display.
 - b. On the Work with Disk Units display, select the *Work with disk configuration* option.
 - c. Select the *Work with ASP configuration* option.
 - d. Select the *Add units to ASPs* option.
 - e. Specify the ASP from which the disk units were removed.
 - f. Select the unit to add to the ASP.
 - g. When the Confirm Add Units display appears, press the Enter key to continue. Wait for the next display.
37. The Add Disk Units function takes several minutes. When it is complete, a message appears stating whether it was successful.

Was the Add Disk Units function successful?

No Yes

↓ On the Work with ASP Configuration display, select the *Display disk configuration capacity* option. The unit you added should be shown in the correct ASP.

This ends the procedure.
38. Do you have more FRUs to exchange?

No Yes

↓ Go to step 34 of this procedure.

39. Ask your next level of support for assistance.
This ends the procedure.

Disk Unit Initialize and Disk to Disk Copy

1. Perform an IPL to dedicated service tool (DST) (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does the Use Dedicated Service Tools (DST) display appear?

Yes No

↓ Repeat this step.

If the same system reference code (SRC) occurs again, the customer data is not recoverable. Go to step 16 on page 859.

If a different SRC occurs, use it to correct the problem.

This ends the procedure.

2. Is this a single disk unit system?

No Yes

↓ Perform “Disk Unit Data Save and Initialize” on page 848.

This ends the procedure.

3. Is the failing disk unit the load-source disk unit?

Note: Disk unit 1 contains the load-source disk unit.

Yes No

↓ Go to step 24 of this procedure.

4. Find another disk unit on the system that is the same type and model as the load-source disk unit.

5. Perform the following to install the new disk drive into a disk unit on the system:

- a. Power off the system.

- b. Slide the disk unit you found in step 4 of this procedure out of the system (see “Chapter 4. Removal and Installation Procedures” on page 593).

- c. Remove the disk drive from the disk unit. Be very careful with the disk enclosure. You will install it again in the disk unit when the service actions to the failing load-source disk unit are complete.

- d. Install the new disk drive in the disk unit.

6. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does the Use Dedicated Service Tools (DST) display appear?

Yes No

↓ Repeat step 1 of this procedure.

7. From the Use Dedicated Service Tools (DST) display, perform the following to format and initialize the disk drive you installed in step 5 of this procedure:

- a. Select the *Work with disk units* option on the Use Dedicated Service Tools (DST) display.

- b. Select the *Work with disk unit recovery* option on the Work with Disk Units display.

Recovery Procedures

- c. Select the *Disk unit problem recovery procedures* option on the Work with Disk Unit Recovery display.
 - d. Select the *Initialize and format disk unit* option on the Problem Recovery Procedures display.
 - e. Select the non-configured unit you installed in step 5 of this procedure as the unit to work with.
 - f. Verify the initialization and formatting by pressing F10. The initialization and formatting may take 30 minutes or longer to complete.
 - g. Return to the Work with Disk Unit Recovery display.
 8. Perform the following to copy data from the load-source disk unit to the disk drive you installed in step 4 of this procedure:
 - a. Select the *Copy disk unit data* option on the Work with Disk Unit Recovery display.
 - b. Select the load-source disk unit (disk unit 1) as the unit to copy.
 - c. Select the non-configured unit you installed in step 5 of this procedure as the unit to copy to.
 - d. The console displays the percent of the data copied. If the number of unreadable pages displays, write down the number of unreadable pages. You will use the number of unreadable pages later in this procedure.
 - e. Wait until the status of the copy is *Complete*. Customer data is not recoverable if one of the following occurs:
 - The copy operation does not complete.
 - There is a large number of unreadable pages to copy from the disk unit.
- Continue with the next step of this procedure.
9. Does the copy operation complete?
No Yes
↓ Go to step 11 of this procedure.
10. Have you already exchanged the disk drive logic card?
Yes No
↓ Perform the following to attempt to save the customer's data:
 - a. Power off the system.
 - b. Remove the disk unit (see "Chapter 4. Removal and Installation Procedures" on page 593).
 - c. Exchange the failing disk drive logic card (see the instructions that come with the card). If you do not know the part number of the disk drive logic card, see "Disk Unit Type, Model, and Part Number List" on page 756. Locate the type and level of the disk drive to find the part number of the disk drive logic card.
 - d. Go to step 1 of this procedure.
11. Perform the following to remove the failing load-source disk drive from the load-source disk unit on the system:
 - a. Power off the system.
 - b. Find the load-source disk unit. Slide the disk unit out of the system (see "Chapter 4. Removal and Installation Procedures" on page 593).
 - c. Remove the load-source disk drive from the disk unit.
12. Perform the following to move the new disk drive into the load-source disk unit:

Recovery Procedures

- a. Slide the disk unit you found in step 4 of this procedure out of the system (see “Chapter 4. Removal and Installation Procedures” on page 593).
 - b. Remove the new disk drive from the disk unit. Be very careful with the disk drive. It contains the load-source data.
 - c. Install the new disk drive into the disk unit that used to contain the load-source disk drive.
 - d. Slide the disk unit into the system.
13. Perform the following to install the disk drive you removed in step 5 of this procedure to make a place for the new disk enclosure:
- a. Install the disk drive you removed in step 5 of this procedure into the disk unit.
 - b. Slide the disk unit into the system.
14. Were any pages unreadable during the copy operation?
- No Yes**
- ↓ Go to step 22 of this procedure.
15. The system is ready for the next IPL.
- This ends the procedure.**
16. Have you already exchanged the disk drive logic card?
- Yes No**
- ↓ Perform the following to attempt to save the customer’s data:
- a. Power off the system.
 - b. Remove the disk unit (see “Chapter 4. Removal and Installation Procedures” on page 593).
 - c. Exchange the failing disk drive logic card (see the instructions that come with the card). If you do not know the part number of the disk drive logic card, see “Disk Unit Type, Model, and Part Number List” on page 756. Locate the type and level of the disk drive to find the part number of the disk drive logic card.
 - d. Go to step 1 of this procedure.
17. Perform the following to remove the failing load-source disk drive from the load-source disk unit on the system:
- a. Power off the system.
 - b. Find the load-source disk unit. Slide the disk unit out of the system (see “Chapter 4. Removal and Installation Procedures” on page 593).
 - c. Remove the load-source disk drive from the disk unit.
 - d. Install the new disk drive in the disk unit.
 - e. Slide the disk unit into the system.
18. Perform an IPL from removable media and select the option to install Licensed Internal Code and recover the configuration. (See “Installing Licensed Internal Code” in the *AS/400 Service Functions* information, which performs an IPL and installs the Licensed Internal Code.)
19. Did you get a Disk Configuration Error Report with a “*Unit has incorrect logical partition configuration*” warning?
- No Yes**
- ↓ You have logical partitions that need to be recovered before you can continue with this disk unit recovery procedure.
- Perform the following:

Recovery Procedures

- a. Enter the *Use Dedicated Service Tools (DST)* option from the IPL or Install the System display.
- b. Enter the password 22222222.

Note: If this password is not valid, ask the customer for the correct password.

- c. Select the *Work with system partitions* option on the Use Dedicated Service Tools (DST) display.
- d. Select the *Recover configuration data* option on the Work with System Partitions display.
- e. Select the *Recover primary partition configuration data* option on the Recover Configuration Data display.
- f. Review the information on the Select Disk Unit for Configuration Data Recovery display. Select the disk unit with the most recent date and correct system serial number and press enter.
- g. The system automatically copies the configuration data to the primary partition's load source, and performs an IPL.
Continue with the next step of this procedure.

20.

The system ASP will be cleared because customer data was not recoverable. Recover the configuration to disk unit 1 in the system unit by doing the following:

- a. Enter the Use Dedicated Service Tools (DST) option from the IPL or Install the System display.
- b. Enter the password 22222222.

Note: If this password is not valid, ask the customer for the correct password.

- c. Select the Work with disk units option on the Use Dedicated Service Tools (DST) display.
- d. Select the Work with disk unit recovery option on the Work with Disk Unit display.
- e. Select the Recover configuration option on the Work with Disk Unit Recovery display. This option assembles the system configuration information on disk unit 1 in the system unit.

Notes:

- a. A warning message appears stating that recovering the configuration destroys all system data.
- b. If you have a system with only one disk unit, a message may appear stating that your request to recover the configuration was not successful. The recover configuration function cannot be performed on a system with only one disk unit.

Continue with the next step of this procedure.

21. The ASP to which the failing disk unit was assigned is cleared. The customer should do the following:

- If the disk unit you exchanged is in ASP 1, have the customer see the Backup and Recovery information. You must restore the operating system (OS/400 Licensed Program) and all customer data.
- If the disk unit is in a user ASP (ASP 2 through ASP 16), data in the ASP is lost. See the Backup and Recovery information.

This ends the procedure.

22. Perform an IPL from removable media and restore the Licensed Internal Code (see “Restoring Licensed Internal Code” in the *AS/400 Service Functions* information). This information shows you how to perform an IPL and restore the Licensed Internal Code.

Note: Some objects may be damaged. The customer may have to load the damaged objects again (see the *Backup and Recovery* information).

This ends the procedure.

23. Is the failing unit missing from the configuration?

No Yes

↓ Go to step 36 of this procedure.

24. Find another disk unit on the system, other than the load-source disk unit, that has the same type and model as the failing disk unit.

Note: If the load-source disk unit is the only other disk unit on the system with the same type and model as the failing disk unit, you must use “Disk Unit Data Save and Initialize” on page 848.

25. Perform the following to install a new disk drive into a disk unit on the system:

- a. Power off the system.
- b. Slide the disk unit you found in step 24 of this procedure out of the system (see “Chapter 4. Removal and Installation Procedures” on page 593).
- c. Remove the disk drive from the disk unit. Be very careful with the disk drive. You will install it again in the disk unit when the repair actions to the failing disk unit are complete.
- d. Install the new disk drive in the disk unit.
- e. Slide the disk unit into the system.

26. Perform an IPL to DST (see “Dedicated Service Tools (DST)” in the *AS/400 Service Functions* information).

Does the Use Dedicated Service Tools (DST) display appear?

Yes No

↓ Repeat step 1 of this procedure.

27. From the Use Dedicated Service Tools (DST) display, perform the following to format and initialize the disk drive you installed in step 25 of this procedure:
 - a. Select the *Work with disk units* option on the Use Dedicated Service Tools (DST) display.
 - b. Select the *Work with disk unit recovery* option on the Work with Disk Units display.
 - c. Select the *Disk unit problem recovery procedures* option on the Work with Disk Unit Recovery display.
 - d. Select the *Initialize and format disk unit* option on the Problem Recovery Procedures display.
 - e. Select the non-configured disk unit you installed in step 25 of this procedure as the unit to work with.
 - f. Verify the initialization and formatting by pressing F10. The initialization and formatting may take 30 minutes or longer to complete.

Recovery Procedures

- g. Return to the Work with Disk Unit Recovery display.
28. Perform the following to copy data from the failing disk drive to the disk drive you installed in step 25 of this procedure:
 - a. Select the *Copy disk unit data* option on the Work with Disk Unit Recovery display.
 - b. Select the failing unit as the unit to copy.
 - c. Select the non-configured unit you installed in step 25 of this procedure as the unit to copy to.
 - d. The console displays the percent of the data copied. If the number of unreadable pages displays, write down the number of unreadable pages. You will use the number of unreadable pages later in this procedure.
 - e. Wait until the status of the copy is *Complete*. Customer data is not recoverable if one of the following occurs:
 - The copy operation does not complete.
 - There is a large number of unreadable pages to copy from the disk unit.

Continue with the next step of this procedure.
29. Does the copy operation complete?
No Yes
↓ Go to step 31 of this procedure.
30. Have you already exchanged the disk drive logic card?
Yes No
↓ Perform the following to attempt to save the customer's data:
 - a. Power off the system.
 - b. Remove the disk unit (see "Chapter 4. Removal and Installation Procedures" on page 593).
 - c. Exchange the failing disk drive logic card (see the instructions that come with the card). If you do not know the part number of the disk drive logic card, see "Disk Unit Type, Model, and Part Number List" on page 756. Locate the type and level of the disk drive to find the part number of the disk drive logic card.
 - d. Go to step 1 of this procedure.
31. Perform the following to remove the failing disk drive from the disk unit on the system:
 - a. Power off the system.
 - b. Find the failing disk unit. Slide the disk unit out of the system.
 - c. Remove the disk drive from the failing disk unit (see "Chapter 4. Removal and Installation Procedures" on page 593).
32. Perform the following to move the new disk drive into the disk unit that held the failing disk drive:
 - a. Remove the new disk drive from the disk unit you found in step 24 of this procedure. Be very careful with the disk enclosure. It contains the disk unit data.
 - b. Install the new disk drive into the disk unit that contained the failing disk drive. You removed the failing disk drive in step 31 of this procedure.
 - c. Slide the disk unit into the system.
33. Perform the following to install the disk drive that you removed to make a place for the new disk drive:

Recovery Procedures

- a. Install the disk drive you removed in step 25 of this procedure into the disk unit.
 - b. Slide the disk unit into the system.
34. Were any pages unreadable during the copy operation?
- No Yes**
- ↓ Some objects may be damaged. The customer may have to load the damaged objects again. Have the customer see the *Backup and Recovery* information.
- This ends the procedure.**
35. The system is ready for the next IPL.
- This ends the procedure.**
36. Are there multiple failing disk units under the same IOA or IOP?
- No Yes**
- ↓ Perform the following:
- a. Power off the system.
 - b. Exchange the storage IOA. If the storage IOA is integrated into the IOP, replace the IOP (see “Chapter 4. Removal and Installation Procedures” on page 593). If you do not know the part number, see “Type, Model, and Part Number List” on page 750.
 - c. Go to step 1 of this procedure.
37. Have you already exchanged the disk drive logic card?
- Yes No**
- ↓ Perform the following to attempt to save the customer’s data:
- a. Power off the system.
 - b. Remove the disk unit (see “Chapter 4. Removal and Installation Procedures” on page 593).
 - c. Exchange the failing disk drive logic card (see the instructions that come with the card). If you do not know the part number of the disk drive logic card, see “Disk Unit Type, Model, and Part Number List” on page 756. Locate the type and level of the disk drive to find the part number of the disk drive logic card.
 - d. Go to step 1 of this procedure.
38. Because the disk data was not recoverable, clear the auxiliary storage pool (ASP) to which the disk unit is assigned by doing the following:
- a. Return to the Work with Disk Units display.
 - b. Select the Work with disk configuration option.
 - c. Select the Work with ASP configuration option.
 - d. Select the Delete ASP data option.
 - e. Enter the Delete option for the ASP you recorded in step 3 on page 857 of this procedure.
 - f. Confirm the Delete ASP Data.
 - g. Return to the Work with Disk Units display.
 - h. Select the Work with disk unit recovery option.
 - i. Select the Replace configured unit option.
 - j. Select the configured disk unit to exchange on the Select Configured Unit to Replace display.

Recovery Procedures

- k. Select the replacement disk unit on the Select Replacement Unit display.
- l. Press the Enter key to confirm the replace operation (this operation takes 10 to 15 minutes to complete).

Attention: The auxiliary storage pool to which the disk unit is assigned is erased. The customer must restore the data to the auxiliary storage pool (have the customer see the Backup and Recovery information).

39. The ASP to which the failing disk unit was assigned is cleared. The customer should do the following:
 - If the disk unit you exchanged is in ASP 1, have the customer see the Backup and Recovery information. You must restore the operating system (OS/400 Licensed Program) and all customer data.
 - If the disk unit is in a user ASP (ASP 2 through ASP 16), data in the ASP is lost. See the Backup and Recovery information.

This ends the procedure.

Recover Remote Load Source

Definitions:

- Local load source - A disk used as the source for IPL data.

Primary Partition:

- For system models 270 and 820, this disk unit must be located in position D01, D02, D03, or D04.
- For system models 830, 840, SB2 and SB3, this disk unit must be located in position D31, D32, D33, or D34.

Secondary Partition:

- See 'Locating a Secondary Partition's Load Source From the Primary Partition's Console' in the *AS/400 Service Functions* information.
- Remote load source - A load source disk unit that is not a local load source.

1. Have you exchanged the local load source disk unit?

Yes No

↓ Exchange the failing disk unit (see "Chapter 4. Removal and Installation Procedures" on page 593 and perform "Disk Unit - Concurrent" for the model or FC that you are working on).

2. Perform an alternate IPL to dedicated service tool (DST) (Type D IPL) (see "Dedicated Service Tools (DST)" in the *AS/400 Service Functions* information).

The Install Licensed Internal Code display appears on the system console.

3. Select the *Install Licensed Internal Code* option (see "Install Licensed Internal Code Utility" in the *AS/400 Service Functions* information).

When the install is complete, the system automatically performs an IPL from disk. The Disk Configuration Attention Report displays. Press F3 to exit to Dedicated Service Tools (DST). **Do not select F10 from the Disk Configuration Attention Report display when you are performing this Recover Remote Load source procedure.**

Note: At this time, the load source disk is the only configured disk unit in the system. The following steps ensure that the destruction of customer data and programs will not occur.

4. Did you get a Disk Configuration Error Report with a "Unit has incorrect logical partition configuration" warning?

No Yes

Recovery Procedures

- ↓ You have logical partitions that need to be recovered before you can continue with this disk unit recovery procedure. Perform the following:
 - a. Enter the Use Dedicated Service Tools (DST) option from the IPL or Install the System display.
 - b. Enter the password 22222222.

Note: If this password is not valid, ask the customer for the correct password.

- c. Select the Work with system partitions option on the Use Dedicated Service Tools (DST) display.
- d. Select the Recover configuration data option on the Work with System Partitions display.
- e. Select the Recover primary partition configuration data on the Recover Configuration Data display.
- f. Review the information on the Select Disk Unit for Configuration Data Recovery display. Select the disk unit with the most recent date and correct system serial number and press enter.
- g. The system automatically copies the configuration data to the primary partition's load source, and performs an IPL. The Disk Configuration Attention Report displays. Press F3 to exit to Dedicated Service Tools (DST). Do not select F10 from the Disk Configuration Attention Report display when you are performing this Recover Remote Load source procedure.

Note: At this time, the load source disk is the only configured disk unit in the system. The following steps ensure that the destruction of customer data and programs will not occur.

Continue with the next step of this procedure.

5. Select the *Start the Dedicated Service Tools* option.
6. Sign on to DST.

Use 22222222 as both the user ID and password. If the customer has changed the ID or password, ask the customer for the correct values.

7. Select the *Work with disk units* option.
8. Select the *Work with disk unit recovery* option.
9. Select the *Recover Mirrored Load source* option.

This function checks the disk units that are attached to the system. If remote mirroring became enabled and a mirror protected, load source disk unit is located, a confirmation display appears. If a mirror protected, load source disk unit is not located, an error display appears.

10. After the confirmation display appears, press F10 to confirm the selection and begin the recover function.

While the Recover Remote Load source function is running, SRC C6xx 4205 (xx represents the percentage of recovery completed) displays on the system control panel.

When the Recover Remote Load source function completes. The system automatically performs an IPL from disk to the IPL or Install the System display. All of the system data, user data, and user ASPs are now available to the system.

This ends the procedure.

Verifying the Repair

1. Were you sent here after completing a concurrent maintenance procedure?
No **Yes**
↓ Go to “Verify Concurrent Repair.” on page 867.
This ends the procedure.
2. Go to “Verify Dedicated Repair.”
This ends the procedure.

Verify Dedicated Repair.

1. Perform the following:
 - a. Verify that the power cable is plugged into the power outlet.
 - b. Verify that power is available at the customer’s power outlet.
2. Select the IPL type and mode that the customer uses (see *AS/400 Service Functions*).

Note: If you select Normal mode when you power on the system, the *Dedicated service tools* option will not be shown.

3. Start an IPL by powering on the system (see “Powering On and Powering Off the System or Expansion Tower” on page 868).

Did the system complete the IPL?

Yes **No**

↓ This may be a new problem. Go to “Starting Point For All Problems” on page 3.

This ends the procedure.

4. Use the service action log to look for any system reference codes (system reference code (SRC)) that are related to this IPL (see “Using the Service Action Log” on page 12).

Are there any SRCs that are related to this IPL?

Yes **No**

↓ Perform the “Verification Procedures” (in the Hardware Service Manager chapter) in the *AS/400 Service Functions* information to verify that the problem is corrected.

The verification procedures only cover removable media, communications and diskette problems.

Then return the system to the customer.

Ensure that the customer verifies the system date and time.

This ends the procedure.

5. Is the SRC the same as the original SRC?

Yes **No**

↓ A new symptom may have occurred.

Use the SRC information and go to “Chapter 2. Unit Reference Codes” on page 17 to determine the cause of the problem.

This ends the procedure.

6. Are there any other failing items that remain to be exchanged?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

7. Exchange the next failing item listed for this URC.

This ends the procedure.

Verify Concurrent Repair.

1. Was concurrent maintenance just performed on an optical storage unit?

No Yes

↓ The Product Activity Log, in most cases, contains an SRC for the optical storage unit after concurrent maintenance.

Perform the "Verification Procedures" in the *AS/400 Service Functions* information to verify that the problem is corrected.

Then return the system to the customer.

Ensure that the customer verifies the system date and time.

This ends the procedure.

2. Use the service action log to look for any new SRCs (see "Using the Service Action Log" on page 12).

Are there any new SRCs?

Yes No

↓ Go to step 5 of this procedure.

3. Are you working with a tape device?

No Yes

↓ Perform the "Verification Procedures" in the *AS/400 Service Functions* information, to verify that the problem is corrected.

Resources which normally vary on automatically during IPL or which were previously varied on manually, may need to be varied back on after "Verification Procedures" have been completed.

Then return the system to the customer.

Ensure that the customer verifies the system date and time.

This ends the procedure.

4. Perform the "Verification Procedures" in the *AS/400 Service Functions* information, to verify that the problem is corrected.

After the verification test has completed, the tape device description will be set to the "Failed" state because a resource change was detected. You will need to vary the tape device description off and back on before it can be used.

Then return the system to the customer.

Ensure that the customer verifies the system date and time.

This ends the procedure.

5. Is the SRC the same as the original SRC?

Yes No

↓ A new symptom may have occurred.

Verifying Repair

Use the SRC information and go to “Chapter 2. Unit Reference Codes” on page 17 to determine the cause of the problem.

This ends the procedure.

6. Are there any other failing items that remain to be exchanged?

Yes No

↓ Ask your next level of support for assistance.

This ends the procedure.

7. Exchange the next failing item listed for this URC.

This ends the procedure.

Powering On and Powering Off the System or Expansion Tower

Powering On the System

1. Open the control panel cover.
2. Press the Power (white) button on the control panel.
3. The Power On light starts blinking at the fast rate of one blink per second as the system is powered on. The light stops blinking and stays on when power on is complete.
4. If the system has multiple partitions, some secondary partitions may not power on if they have been configured to "Hold". To determine if a secondary partition has been configured to "Hold" check the "Sys IPL Action" for the partition on the *Work with partition status* screen. See *AS/400 Service Functions*. If you need to IPL a secondary partition with a "Sys IPL Action" of "Hold" see "Powering On a Secondary Partition".

This ends the procedure.

Powering On a Secondary Partition

Attention: Powering on a secondary partition will not power on any expansion I/O towers that the logical partition owns. If it is necessary to power on expansion towers owned by the secondary partition, use the "Expansion Tower Power Procedure" on page 871 before powering on the secondary partition.

1. Go to the console of the Primary partition.
2. From the *Use Dedicated Service Tools (DST)* screen select the *Work with system partitions* option.
3. At the *Work with system partitions* screen:
 - a. Select *Work with Partition Status*.
 - b. Select the *Power On* option next to the logical partition that you want to IPL and press enter.

Powering Off the System

Attention: Power off and power on of a system with multiple partitions are different than a system with a single partition. Read and understand the power off and power on procedures referenced when a procedure directs you to power on or power off a system or partition.

If the system is operating under Dedicated Service Tools (DST), power off the system by selecting the *Power off the system* option on the Start a Service Tool display.

If the system is operating under OS/400, enter the *PWRDWNSYS* command to power off the system.

Note: For consoles that run Client Access, a delayed power-off operation by using the *PWRDWNSYS* command is required. You **must** stop all applications, including console applications, and subsystems that are running, before the delayed power-off operation is complete.

If you cannot use these methods, you can power off the system by using the "Control Panel Power Button" procedure.

Control Panel Power Button

Attention: Using the control panel Power pushbutton to power off the system may cause unpredictable results in the data files, and the next IPL will take longer to complete.

1. Open the control panel cover.
2. The system must be in Manual mode to power off. To select Manual mode, see *AS/400 Service Functions*.
3. Press the Power button (white) on the control panel.
The Data-Function display shows **O?** (the international power-off symbol).
4. Press the Power button (white) on the control panel again.

Note: To cancel the power-off operation, do not press the Power button a second time. Instead, press any other control panel button.

5. The Power On light starts blinking at the fast rate of one blink per second as the system powers off. The light starts blinking at the slow rate of one blink per three seconds when the power-off operation is complete.

Does the system power off successfully?

No **Yes**

↓ **This ends the procedure.**

6. Perform the following:
 - a. Press the ↑ or the ↓ button until function 08 is shown in the Function display.
 - b. Press the Enter button.
 - c. SRC A100 8008 is on the Data display.
7. Press the Power button (white) on the control panel.
The Data-Function display shows **O?** (the international power-off symbol).
8. Press the Power button (white) on the control panel again.
The system powers off, and the Power On light blinks at the slow rate of one blink per three seconds.

Note: To cancel the power-off operation, do not select function 08. Instead, press any other control panel button.

This ends the procedure.

Powering Off a System With Logical Partitions

Determine if the system must be powered off or if only the secondary partition that you are servicing must be powered off by using the following table as a guide.

Verifying Repair

The Service Action is:	Go to:
A power or system power control network problem.	"Powering Off a Logical Partition System Using the Control Panel or Primary Partition".
A processor, system storage or processor clock problem.	"Powering Off a Logical Partition System Using the Control Panel or Primary Partition".
A problem with any resource owned by the Primary partition.	"Powering Off a Logical Partition System Using the Control Panel or Primary Partition".
The SRC came from the system control panel.	"Powering Off a Logical Partition System Using the Control Panel or Primary Partition".
The part to remove or install or isolate is in the system unit. The part to remove or install or isolate is in the system expansion unit.	"Powering Off a Logical Partition System Using the Control Panel or Primary Partition".
The part to remove or install or isolate is in an expansion tower. • AND The expansion tower can be powered down using the Hardware Service Manager in the Secondary partition that you are servicing.	Power off the secondary partition using the "Powering Off a Secondary Partition" on page 871, then power off the expansion tower using the "Expansion Tower Power Procedure" on page 871.
The part to remove or install or isolate is in an expansion tower. • AND The expansion tower cannot be powered off from the secondary partition that owns it. The tower can only be powered off using the Hardware Service Manager in the Primary partition.	Power off the secondary partition using the "Powering Off a Secondary Partition" on page 871, then power off the expansion tower using the "Expansion Tower Power Procedure" on page 871.
Powering off a secondary partition failed.	"Powering Off a Logical Partition System Using the Control Panel or Primary Partition".
From the Primary partition you were instructed to power down the system.	"Powering Off a Logical Partition System Using the Control Panel or Primary Partition".

Powering Off a Logical Partition System Using the Control Panel or Primary Partition

Attention: This procedure will result in powering off the entire system including all secondary partitions. Be certain that all secondary partitions are able to be powered off at this time. Do not continue with this procedure until the customer will allow all logical partitions to be powered off.

Note: Abnormal IPL's in the secondary partitions can result from powering off the Primary partition. To avoid abnormal IPLs in secondary partitions, power off all secondary partitions, when possible, before powering off the Primary partition.

If the Primary partition is under Dedicated Service Tools (DST), power off the system from the Primary partition by selecting the *Power Off the System* option on the *Start a Service Tool (SST)* display of the Primary partition's console.

If the Primary partition is operating under OS/400, from the Primary partition's console enter the *PWRDWNSYS* command to power off the system.

If you cannot use these methods, you can power off the system by using the procedure "Control Panel Power Button" on page 869.

Note: For consoles on the Primary partition that run Client Access, a delayed power-off operation by using the *PWRDWNSYS* command is required. You **must** stop all applications, including console applications, and subsystems that are running in **all** logical partitions, before the delayed power-off operation is complete.

Attention: Using the control panel power push-button to power off the system may cause unpredictable results in the data files, and the next IPL will take longer to complete.

Powering Off a Secondary Partition

Attention: Powering off a secondary partition will not power off any expansion tower(s) that the partition owns. If it is necessary to power off the expansion tower(s) owned by the secondary partition, use the "Expansion Tower Power Procedure". Power off the secondary partition(s) before powering off the expansion tower(s) owned by the logical partition(s).

If the secondary partition is operating under Dedicated Service Tools (DST), power off the logical partition by selecting the *Power Off the System* option on the *Start a Service Tool (SST)* display of the secondary partition's console.

Note: To locate the secondary partition's console or alternative console, see *AS/400 Service Functions*.

If the secondary partition is operating under OS/400, from the logical partition's console enter the *PWRDWNSYS* command to power off the secondary partition.

Note: For consoles on the secondary partition that run Client Access, a delayed power-off operation by using the *PWRDWNSYS* command is required. You **must** stop all applications, including console applications, and subsystems that are running in the **secondary** partition before the delayed power-off operation is complete.

If the secondary partition fails to power off **or** if the console of the secondary partition is not functioning:

1. Go to the console of the Primary partition.
2. From the *Use Dedicated Service Tools (DST)* screen, select the *Work with System Partitions* option.
3. At the *Work with System Partitions* screen:
 - a. Select the *Work with Partition Status* option.
 - b. Select the *Power off Delayed* option and press enter.

If the secondary partition fails to power off then go to "Powering Off a Logical Partition System Using the Control Panel or Primary Partition" on page 870.

Expansion Tower Power Procedure

Note: If the system has logical partitions, then all operations on the console refer to the console of the logical partition in which you are working.

Verifying Repair

Note: To locate a secondary partition's console go to *AS/400 Service Functions*.

Use this procedure only to power off an expansion tower when you are performing one of the following:

- Removing or replacing a failing part within an expansion tower.
- Adding, moving, removing, or replacing a failing item within an expansion tower.

Do not use this procedure on the system unit or the integrated expansion unit.

Do not use this procedure to replace disk units that are supported under device concurrent maintenance. Use device concurrent maintenance instead.

Do not use this procedure on FC 503x, FC 5076, and FC 5077 migrated towers.

Do not use this procedure for Feature code 504x towers. If you are powering off a 504x tower then power off the system unit. Go to "Powering On and Powering Off the System or Expansion Tower" on page 868.

Attention: Perform this action only with the assistance of the customer.

1. Check to see that no other towers are powered off at this time.

Attention: During this procedure only one tower connected to this system can be powered off! You must not have more than one tower powered off at any given time during this service action!

2. Are you working in an **FC 5066** or **FC 5079** expansion tower?

No **Yes**

↓ **Power off only the unit** (FC 5074 or FC 5065) that you are servicing.

Attention: Only one unit may be powered off at any given time!

Continue with the next step of this procedure.

3. Were you directed to power off the tower to set the SPCN configuration ID?

No **Yes**

↓ Go to step 6 on page 873 of this procedure.

4. Verify that the "type numbers" (ie; IOPs, IOAs, etc.) contained in the expansion tower that you are powering off, matches what is shown on the system by performing the following:

- a. From the SST or DST menu, select the *Start a service tool* option.
- b. Select the *Hardware service manager* option.
- c. Select the *Packaging Hardware Resources (systems, frames, cards,...)* option.

Note: If you have only the resource name, select the *Locate Resource by Resource Name* option and display the *Associated packaging resource(s)* for the selected resource. Use the Frame ID shown for the selected resource in step 4d.

- d. Select the *Hardware contained within package* option for the Frame ID of the Expansion Unit. Ensure that all of the resources displayed match the resources in the expansion tower that you are powering off.
5. Work with the customer to end all bus activity in the tower by performing one of the following:

Note: If multiple logical partitions own IOPs on the bus, then the customer will be directed to end all of the bus activity in each of those partitions.

- If the expansion tower does not contain disk unit IOPs, work with the customer to end all jobs and vary off all devices, lines, and controllers for that expansion tower.
- If the expansion tower contains disk unit IOPs and the disk units are **not** mirrored to disk units in other expansion towers, work with the customer to end all communications activities to these disk units by ending all subsystems.
- If the expansion tower contains disk unit IOPs and these disk units **are** mirrored to disk units in other expansion towers, you do not need to end all subsystems. Mirroring will assist during the service action.
- If the system has a non-redundant (single hub configuration) OptiConnect bus, work with the customer to end all jobs and vary off the QSOC resources on the affected system.

Note: Use the WRKOPCACT command to work with the QSOC resources on the affected system.

- If the system has a redundant (dual hub configuration) OptiConnect bus, you do not need to end subsystems or vary off the resources. Redundancy will assist during the service action.

6. Power off the expansion tower by performing the following:

Attention: If any console for a logical partition resides on the bus that you are powering off, then powering off the bus will result in the loss of that partition's console. **If this condition exists** for the partition that you are working in, you will need to perform this procedure from the primary partition's console.

- a. Use the system console and get to the SST or DST menu. Select the *Start a service tool* option.
- b. Select the *Hardware service manager* option.
- c. Select the *Packaging Hardware Resources (systems, frames, cards,...)* option.
- d. From the Packaging Hardware Resources display, specify the *Concurrent Maintenance* option for the expansion tower that you are powering off, then press the power off **PF** key.

Note: If resources on the bus or buses are active, you will receive a message indicating which resources are in use and the expansion tower will not power off. Return to step 5 on page 872 of this procedure and ensure that all resources on the bus are varied off. Follow the instructions on the screen for locating the active resources and varying them off.

Note: If the system has logical partitions and multiple logical partitions own IOPs on the bus, then you must do the power off from the Primary partition's console. When instructed to power on the expansion tower, do it from the console of the Primary partition.

- e. The *"Confirm Power Off"* display appears. Follow the instructions on the display.

Note: You may be directed to perform a function 68 to power the tower down **and** a function 69 to power the tower back on, or you may be directed to do only a function 69 to power the tower back on. **Make a note of what you were instructed to do at this time!** You will

Verifying Repair

need this information to complete the repair.

Ensure that the frame ID displayed is correct for the expansion tower that you intend to power off, and press the Enter key.

- f. Wait for the expansion tower to power off. This may take several minutes depending on the I/O configuration and number of buses in the system power control network.

When the power off action is initiated, DST reports that the expansion tower is powered off successfully. However, to ensure that the expansion tower is actually powered off; verify that **one** of the two air moving devices (AMD) in the expansion tower has stopped and that the power LED indicator on the expansion tower control panel is off.

Note: If the expansion tower contains disk IOPs, an attention SRC may appear on the control panel. Note the following:

- Ignore the SRCs if the expansion tower completes the power off procedure.
- If the expansion tower does not power off in the maximum time allowed, the system may be hung. You must power off the entire system from the control panel to do the repair.

7. Were you directed to power off the tower to set the SPCN configuration ID?

No **Yes**

↓ You can now set the configuration ID in the Tower Card. When you are instructed to power the tower on, go to step 10b of this procedure.

8. When the expansion tower is powered off, disconnect the power cord.

9. Remove or install the part, then continue with the next step.

Notes:

- a. On OS/400 V4R3 and earlier, a failing IOP or feature card that is removed can be re-installed **only** in the original position.
- b. Ensure that you replace the failing IOP, IOA, or feature card with the same type and model.
- c. When IOPs and feature cards are moved or removed, ensure that the configuration rules are followed. (For example, two empty card positions are not allowed between IOPs or feature cards.)
- d. When adding, moving, or removing IOPs or feature cards that occupy multiple card positions, such as the Integrated Netfinity Server for AS/400 IOPs, pay special attention to the configuration rules so that no occupied card locations are left in an electrically open condition (there are not two empty card positions between IOPs or feature cards).

10. Perform the following:

- a. Reconnect the AC power cord.

Note: The tower will automatically power on however, you will need to finish the steps in this procedure to complete the power on and restore the system to normal operation.

- b. Were you instructed to perform a function 69 to power the tower on?

Yes **No**

↓ Go to step 10f on page 875 of this procedure.

- c. Are you working on a system that has multiple partitions?

Yes **No**

- ↓ Perform the function 69 (with the control panel set to Manual Mode) from the control panel (See “Control Panel Functions” in the *AS/400 Service Functions* information). Then, go to step 11 of this procedure.
- d. Are you working in the Primary partition?
 - No** **Yes**
 - ↓ Perform the function 69 (with the control panel set to Manual Mode) from the control panel (See “Control Panel Functions” in the *AS/400 Service Functions* information). Then, go to step 11 of this procedure.
- e. Perform function 69 from the *Work with partition status* screen in the Primary partition. Then, go to step 11 of this procedure.
- f. If the Packaging Hardware Resources display is available, specify the *Power on* option for the expansion tower you were working on and press the Enter key.
- g. If the Packaging Hardware Resources display is **not** available, select (with the control panel set to Manual Mode) the SPCN control panel function to power on the expansion tower.

Note: See “Control Panel Functions” in the *AS/400 Service Functions* information.

- 1) Select function 07 and press enter.
- 2) Increment to 01 and press enter.

This will send out a Rack Power On command on the SPCN Network which will restore power to the expansion tower, which has become powered off.

11. From the Packaging Hardware Resources display, select the *Associated Logical Resource(s)* option for the expansion tower.

The Logical Hardware Resources Associated a Packaging Resource display shows the status of devices and IOPs.
12. When all expected resources appear with an operational status, work with the customer to bring the system to the operational state.

Note: For V4R3, a resource that has been removed will show a status of *Not Connected*. For earlier systems the status will show as *Disabled*.

Work with the customer to restart all bus activity:

- Start all subsystems that were ended.
- Vary on all devices, lines, and controllers for the expansion tower that was powered off.
- Start customer applications.

This ends the procedure.

Determining if the System Has Logical Partitions

This procedure instructs the user on how to determine if the system has logical partitions.

1. Go to the Primary partition system console.
2. From the SST or DST screen select the *Work with system partitions* option.
3. At the *Work with system partitions* screen:

Determining if the System Has Logical Partitions

- a. Note the *Partition manager release*.
 - b. Note the *Number of partitions*.
4. Each system will always have at least one (1) or more logical partition(s). The first partition in the system will always be named the "Primary" partition. Some systems have the Primary partition and multiple (secondary) partitions configured.
- Is the number of partitions one (1)?
- | No | Yes |
|----|--|
| ↓ | The system does not have multiple logical partitions. You are working with a system that has a Primary partition only. Return to the procedure, failing item or symbolic FRU that sent you here. |
5. The system has multiple logical partitions. Read and understand the logical partitions information in *AS/400 Service Functions*. Then return to the procedure, Failing Item, or Symbolic FRU that sent you here.

Storage I/O Card Modes and Jumpers

The 2748 I/O card can run in either Compression mode or Enhanced mode. The tailstock of the I/O card is marked with a C, indicating compression mode, and an E, indicating enhanced mode. Three pins on the tailstock determine the mode of the card, depending on which of the pins have a jumper placed on them.

You can determine and set the mode of the I/O card by locating the three pins on the card's tailstock.

You can also switch the mode of the I/O card by changing the location of the jumper on the card's tailstock.

The jumper may be moved at any time, but changes only take effect during a system IPL.

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.
- If the error message is CPPEA21, the I/O card has detected that the jumper is missing. See Mode Jumper is Missing.

Determining and Setting the Mode of an I/O Card

The 2748 I/O Card supports two modes, compression and enhanced.

Mode Description

Compression Mode

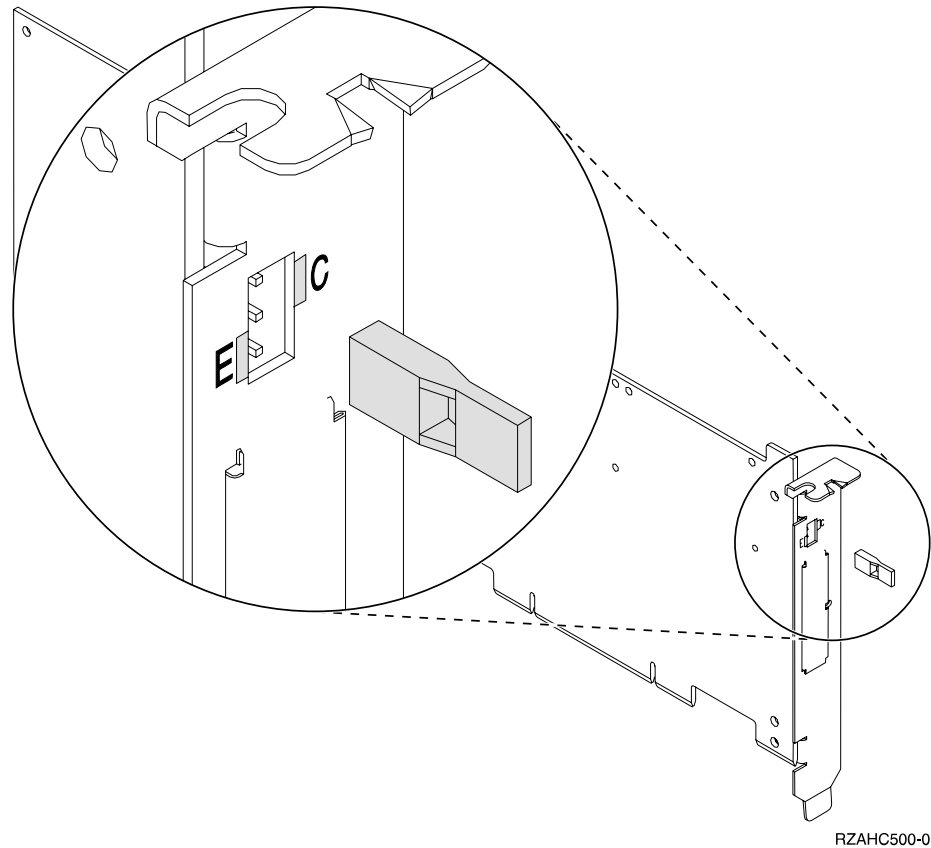
Compression mode should only be used when you wish to run Integrated Hardware Disk Compression. In compression mode, the write cache size is 4MB.

Enhanced Mode

Enhanced mode has an enhanced write cache size. In Enhanced mode, the write cache size is 26MB. Enhanced mode also provides support for Extended Adaptive Cache (via attachment of a Read Cache Device) and Extended Adaptive Cache Simulator.

Storage I/O Card Modes and Jumpers

Refer to the illustration below while performing this procedure.



Set the mode of the card to Compressed (C) by placing the jumper on the top and middle pins. Set the mode of the card to Enhanced (E) by placing the jumper on the middle and bottom pins.

Switching the Mode of an I/O Card

If the mode jumper is not in the desired position (See Determining and Setting the Mode of an I/O Card) do the following:

1. Power off the system, ensuring that no jobs are currently processing. (See "Starting and Stopping the System" in Chapter 1 of *Basic System Operation, Administration, and Problem Handling*).
2. Move the mode jumper to the position that is desired. See Determining and Setting the Mode of an I/O Card.

Note: The mode jumper is accessible without requiring the removal of the I/O Card.

3. Select the IPL type and mode.
4. Power on the system.

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.

To begin correcting this error, examine the mode jumpers in the tailstock section of the Storage I/O card.

Storage I/O Card Modes and Jumpers

If the mode jumper is not in the desired position(See Determining and Setting the Mode of an I/O Card), do the following:

1. Power off the system, ensuring that no jobs are currently processing. (See "Starting and Stopping the System" in Chapter 1 of *Basic System Operation, Administration, and Problem Handling*).
2. Move the mode jumper to the position that is desired. See Determining and Setting the Mode of an I/O Card.

Note: The mode jumper is accessible without requiring the removal of the I/O Card.

3. Select the IPL type and mode.
4. Power on the system.

This ends the procedure.

If the mode jumper is in the desired position and any other I/O card or device SRCs occurred at about the same time as this error, Contact your IBM service center.

If the mode jumper is in the desired position and no other I/O card or device SRCs occurred at about the same time as this error, then power the system down normally and IPL (see "Starting and Stopping the System" in Chapter 1 of *Basic System Operation, Administration, and Problem Handling*).

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 "Starting and Stopping the System" in Chapter 1 of *Basic System Operation, Administration, and Problem Handling*).
3. Install the jumper in the correct position (see "Determining and Setting the Mode of an I/O Card" on page 876).
4. Power on the system.

This ends the procedure.

SRC Address Formats

Use this section to determine the IOP and device addresses from either a control panel or a console display.

1. Was the SRC and addressing information obtained either from a control panel display or the Main Storage Dump Manager screen?

No **Yes**

↓ Go to step 5 of this procedure.

2. Are you using the Service Action Log?

Yes **No**

↓ Go to step 8 of this procedure.

3. Display the FRU details for the problem that you are attempting to fix. The address information in the field-replacable unit detail is only available for IOPs and devices.

Is the field-replaceable unit an IOP, IOA, or device *and* is there an address in the Location field of the display?

No Yes

↓ Go to step 6 of this procedure.

4. Go to *AS/400 Service Functions* to obtain the address information. When that procedure instructs you to return to the previous procedure, return to step 6 of this procedure.
5. Addressing information is in the Bus-Bus-Bus-Bus/Card-card/board-board (BBBBCccb) format as follows:
 - If the last 2 characters of word 2 are 60:
 - The IOP address is in word 4 in the format “BBBBCccb”.
 - The device address is the 8 characters of word 5 in the format “abcd efgh”.
 - If the last 2 characters of word 2 are 13, 17, 27, or 29:
 - The IOP address is in word 3 in the format “BBBBCccb”.
 - The device address is the 8 characters of word 4 in the format “abcd efgh”.
 - If the last 2 characters of word 2 are 62:
 - The IOP address may be in word 7 in the format “BBBBCccb”.
 - The device address may be the 8 characters of word 6 in the format “abcd efgh”.
6. The BBBBCccb format is the direct select address of a card position in the system unit, expansion unit or expansion tower. The format definition is:
 - BBBB—System Bus (in hexadecimal, must be converted into decimal to match HSM bus numbers on console screens and in service documents))
 - Cc—System Card
 - bb—System Board
7. Go to step 10 of this procedure for device and address information.
8. Addressing information is in the Bus/Board/Card format.

Note: This format shows the system bus number in decimal form.

If no address information is available in the console error message, check the product activity log entry that is associated with the console error message. Figure 85 on page 880 is an example of a product activity log display for a storage device. Other devices (for example, workstations or communications) have similar displays. For more information about the product activity log, see “Product Activity Log” in *AS/400 Service Functions*.

SRC Address Formats

Display Address Information for Resource				
Name	Type	Model	Serial Number	Resource Name
Storage	6607	050	83-00834	DD001
Physical Location				
Frame ID	. . . . . : 1			
Device Position	. . . . . : L01			
Logical Address:				
SPD Bus:				
System Bus	. . . . . : 1		Storage:	
System Board	. . . . . : 0		I/O Adapter	. . . . . : 0
System Card	. . . . . : 1		I/O Bus	. . . . . : 0
			Controller.	. . . . . : 1
			Device	. . . . . : 0

Figure 85. Product Activity Log display example

In the above example, the contents of “Storage” are defined as follows:

Reference

Description

I/O Bus

This is the SCSI bus to which the device is connected.

I/O Adapter

This is the adapter that the I/O bus connects to on the I/O processor.

Controller

This is the logical controller for the addressed device. The address jumpers on the disk unit define the logical controller for a disk unit in Models 150 and 4xx. Verify the physical and logical address during any repair action.

The connection of the disk unit to its physical location defines the logical controller for a disk unit on models other than 150 and 4xx.

Device

This is the *logical* device that is attached to the *logical* device controller.

- Use Figure 86 on page 881 to understand how addresses in the Bus/Board/Card format relate to the Bus-Bus/Card/Board format. You can also use Figure 86 on page 881 to understand how addresses in the Bus/Board/Card format relate to the direct select addresses used in “Expansion Tower Locations and Addresses” on page 687.

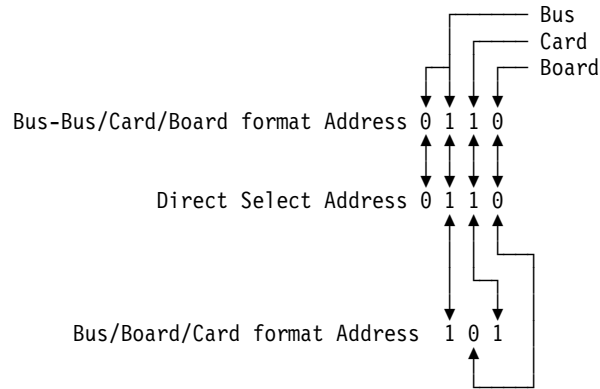


Figure 86. Format Conversion

- Unit (Device) Address Definitions are explained in an “abcd efgh” format. For example, if the unit address is 0100 FFFF or 0001 00FF, the address relates to the “abcd efgh” format as follows:

Partition Information	
Partition's ID	
Partition's Name (Not Req'd)	
Partition's State Examples: Failed, Hold, etc.	
Partition's OS/400 Version and Release Example: V4R4	
Record the Date and Time system values set in the partition if possible.	

The characters “abcd efgh” can have different meanings, depending on the subsystem that reports the problem. However, they define the information that is contained in the unit (device) address as follows:

SRC Address Formats

Communications

a I/O Bus
b Adapter
c 0
d Port
e 0
f Channel
gh FF

Disk, Tape, or Optical without I/O adapter address (Type A)

a I/O Bus
b Controller
c 0
d Device
efgh FFFF

Workstation

a I/O Bus
b Adapter
cd Port
e 0
f Device
g 0
h Session

Disk, Tape, or Optical with I/O adapter address (Type B)

a I/O Adapter
b I/O Bus
cd Controller
ef Device
gh FF

Note: If the unit (device) address appears as FFFF FFFF, the address cannot be determined.

11. OS/400 communication-diagnostic panels that are displayed by the commands VFYCMN, WRKPRB, and ANZPRB use the following address format:

x1 x2 x3x4

Table 39. Decimal Address Values

Value	Description
x1 = System bus	The one, two or three digit decimal representation of the hexadecimal Bus value of the Bus/Board/Card format Address at the bottom of Figure 86 on page 881.
x2 = System board	The one or two digit decimal representation of the hexadecimal Board value of the Bus/Board/Card format Address at the bottom of Figure 86 on page 881.
x3 = System card	The one or two digit decimal representation of the hexadecimal Card value of the Bus/Board/Card format Address at the bottom of Figure 86 on page 881.
x4 = Adapter location	The one or two digit decimal representation of the hexadecimal b Adapter value of the Communications unit address value in step 10 on page 881.

Return to the information that sent you to this procedure.

This ends the procedure.

Hardware SRC Formats

Table 40. SRC format examples (other formats exist; if necessary contact your next level of support)

SRC word number	Panel Function	IOP SRC Format 13	IOP SRC Format 17	Device SRC Format 27	LIC SRC Format 60	LIC SRC Format 61	LIC SRC Format 62	LIC SRC Format 63
1	11	TTTT RRRR	TTTT RRRR	tttt rrrr	A6xx RRRR	B6xx RRRR	ww00 RRRR	A600 RRRR
2	12	MIGV EP13	MIGV EP17	MIGV EP27	MIGV EP60	MIGV EP61	MIGV EP62	MIGV EP63
3	13	BBBB Ccbb	BBBB Ccbb	BBBB Ccbb	PPPP 0000	cccc cccc	cccc cccc	AAAA BBBB
4	14	aaaa aaaa	aaaa aaaa	aaaa aaaa	BBBB Ccbb	pppp pppp	pppp pppp	CCCC DDDD
5	15	TTTT LMMM	TTTT LMMM	tttt lmmm	aaaa aaaa	qqqq qqqq	RRRR rrrr	EEEE FFFF
6	16	uuuu uuuu	ttt lmmm	TTTT LMMM	ttt mmmm	qqqq qqqq	aaaa aaaa	GGGG HHHH
7	17	uuuu uuuu	ZZZZ rrrr	ZZZZ RRRR	ssss ssss	0000 0000	BBBB Ccbb	JJJJ KKKK
8	18	uuuu uuuu	ssss ssss	ssss ssss	NNNN 0000	0000 0000	ttt lmmm	TTTT 0MMM
9	19	uuuu uuuu	uuuu uuuu	uuuu uuuu	0000 0000	0000 0000	ZZZZ ZZZZ	SSSS SSSS

For further definition of the "Logical Address Format" - see *AS/400 Service Functions* "Logical Address Format" information.

AAAA

Type of I/O Bus (see Logical Address Format - field 'A')

aaaa Unit address

BBBB System Bus Number (see Logical Address Format - field 'B')

BBBCCcbb

Bus, bus, bus, bus, card, card, and board, board address (Direct Select Address or DSA)

CCCC System Board Number (see Logical Address Format - field 'C')

cccc cccc

Component reference code. Format 62 varies by component.

DDDD

System Card Number (see Logical Address Format - field 'D')

EEEE (see Logical Address Format - Unit Address type - field 'E')

FFFF (see Logical Address Format - Unit Address data - field 'F')

GGGG

(see Logical Address Format - Unit Address data - field 'G')

HHHH

(see Logical Address Format - Unit Address data - field 'H')

JJJJ

(see Logical Address Format - Unit Address data - field 'J')

SRC Address Formats

KKKK	(see Logical Address Format - Unit Address data - field 'K')
0MMM	Model number of failing device (i.e. MMM='001')
SSSSSSSS	System Reference Code - this SRC is used to determine why the primary console failed to respond.
PPPP	Cause code
Immm	Level indicator plus 3"digit model number of failing device
LMMM	Level indicator plus 3"digit model number (for example, 0001)
MIGV EP	General system status.
NNNN	Number of disk device facilities that are missing
PPPP PPPP	Programming reference code
qqqq qqqq	Programming reference code qualifier
rrrr	Outboard failing unit reference code (URC)
RRRR	Unit reference code (URC)
ssss	Serial number of failing unit
ttt	Outboard failing unit type number (for example, 6607)
TTTT	Type number or card identification number (hex)
uuuu	Unit-specific data
ww	SRC type
ZZZZ	Reserved

Note: Function 20 displays the machine type (940x), model number, and processor feature code.

Important Cryptographic I/O Processor Information

Attention: The type 2620 or type 2628 cryptographic I/O processor should not be removed or disconnected except by qualified IBM service personnel. Performing this action *for any reason* causes the loss of the primary encryption key.

Before disconnecting or removing the cryptographic I/O processor, ensure that the customer has access to a record of the primary encryption key. After any service action that involves disconnecting or removing the processor, the customer must reinstall the primary encryption key. This is the only way that the customer can access the data encryption function. Refer the customer to this document for more information:

IBM Common Cryptographic Architecture Services/400 Installation and Operating Guide, SC41-0102

System/370 Interface Information

Introduction

The System/370-type sequences are specifically for the 3422/3430 and 3480/3490 Tape Units. Therefore, the attachment of other System/370 devices is not valid.

Use this information when you are sent here by the System/370 Interface Cable Wrap Test (5077) in "Tape I/O Processor Problem Isolation Procedures" on page 465.

Cable Wrap Test

The cable wrap test first checks to determine if all bits can be reset to zero. Any bits remaining at an *up* level (failing to reset) cause the error display in Figure 87 to appear. The failing bit is sometimes named a *hot* bit. For the bus lines, the bits represent bus bits 0 through 7. For the tag lines, the bits represent the specific tag lines as shown by the abbreviations to the right of the bit layout.

In Figure 87, the *Active Tag lines equal* field has a hexadecimal character (translate to equal 8 binary bits) 40 in it. This means that either Address Out or Address In is always *hot*.

Channel Cable Wrap Test

The channel cable wrap test did not clear these lines:

Active Tag lines equal (in hexadecimal) . . . : 40

Active Bus lines equal (in hexadecimal) . . . : 00

Bit Number	Tag lines		Bus Lines			
	Out	In	Out	In		
0	OP	--	OP	0	--	0
1	ADR	--	ADR	1	--	1
2	HLD/SEL	--	DSC/SEL	2	--	2
3	SUPR	--	REQ	4	--	4
4	SRV	--	SRV	5	--	5
5	CMD	--	STA	6	--	6
6	DAT	--	DAT	7	--	7
7	CHMSYNC	--	MRK	3	--	3

Press Enter to continue.

Figure 87. Example Display Only

Table 41 shows the interface line names for the tag line abbreviations in this error display.

Table 41. Interface Line Names

Abbreviation	Line Name	Cable
OP	Operational Out/In	Tag
ADR	Address Out/In	Tag
HLD	Hold Out	Tag
DSC	Disconnect In	Tag

System/370 Interface

Table 41. Interface Line Names (continued)

Abbreviation	Line Name	Cable
SEL	Select Out/In	Tag
SUPR	Suppress Out	Tag
REQ	Request In	Tag
SRV	Service Out/In	Tag
CMD	Command Out	Tag
STA	Status In	Tag
DAT	Data Out/In	Tag
CHM SYNC	Chim Sync (Mark 0 Out)	Tag
MRK	Mark 0 In	Bus

The cable wrap test also activates (switches on) each outbound bus and tag line and waits for a response on the wrapped inbound line. After a period of time, the cable wrap test continues until all outbound lines have been wrapped. The results are then displayed on the error display. Figure 88 is an example of the display that appears when any bit in the bus or tag line fails to respond. The failing bit is sometimes named a *dead* bit.

When the expected data does not match the actual data, the bit pattern shown indicates the bit in the bus or tag line that is in error. For the bus lines, each pattern represents a byte of data sent on the bus. This byte represents bus bits 0 through 7. For example, if the actual data under the expected pattern of A5 is 85, then the failing bus bit is bit 2.

```

Channel Cable Wrap Test

Bus (flags and bit patterns):

Flags          *
Expected  5A  A5  80  40  20  10  08  04  02  01  FF
Actual    5A  85  80  40  20  10  08  04  02  01  FF

Tag (bit patterns):

SE/SE
OP/OP  AD/AD  HD/DC  SP/RE  SR/SR  CD/ST  DA/DA  CMS/MI
Expected  80    40    20    10    08    04    02    01
Actual    80    40    20    10    08    04    82    01

Press Enter to continue.

```

Figure 88. Example Display Only

Table 42 on page 887 shows the interface line names for the tag line abbreviations in this error display.

Table 42. Interface Line Names

Abbreviation	Line Name	Cable
OP	Operational Out/In	Tag
AD	Address Out/In	Tag
SE	Select Out/In	Tag
HD	Hold Out	Tag
DC	Disconnect In	Tag
SP	Suppress Out	Tag
RE	Request In	Tag
SR	Service Out/In	Tag
CD	Command Out	Tag
ST	Status In	Tag
DA	Data Out/In	Tag
CMS	Chim Sync (Mark 0 Out)	Tag
MI	Mark 0 In	Bus

Note: An asterisk above the expected pattern means that a Bus In parity check occurred on that pattern, or that the pattern was in error. If the data in the *Expected* and *Actual* rows is the same, there could be a problem with the parity bit.

For the tag lines, the bits represent the specific tag lines, as shown by the abbreviations above the *Expected* and *Actual* data. For example, if the *Actual* data under the *Expected* pattern of 02 is an 82, this means that the Op Out or Op In tag line was switched on.

If a new cable is not available, use the “Card and Channel Wrap Layout (Type 2644)” on page 891 and a multimeter to test for the continuity of each line and for short circuits between lines.

Repair a failing line by exchanging it with one of the lines not used (see “System/370 Channel Bus Cable Pin Layout (Type 2644)”).

System/370 Channel Bus Cable Pin Layout (Type 2644)

In Table 43, the *Card Connector Pin* column identifies the 78-pin connector on the back of the tape I/O processor card (type 2644), which is found in the card enclosure.

Table 43. System/370 Channel Bus Cable Pin Layout (Type 2644)

Line Name	Card Connector Pin
Bus Out bit P	9
Bus Out bit P ground	10
Bus In bit P	47
Bus In bit P ground	46
Bus Out bit 0	69
Bus Out bit 0 ground	68

System/370 Interface

Table 43. System/370 Channel Bus Cable Pin Layout (Type 2644) (continued)

Line Name	Card Connector Pin
Bus In bit 0	5
Bus In bit 0 ground	6
Bus Out bit 1	7
Bus Out bit 1 ground	8
Bus In bit 1	67
Bus In bit 1 ground	66
Bus Out bit 2	49
Bus Out bit 2 ground	48
Bus In bit 2	25
Bus In bit 2 ground	26
Bus Out bit 3	27
Bus Out bit 3 ground	28
Bus In bit 3	45
Bus In bit 3 ground	44
Bus Out bit 4	21
Bus Out bit 4 ground	22
Bus In bit 4	23
Bus In bit 4 ground	24
Bus Out bit 5	63
Bus Out bit 5 ground	62
Bus In bit 5	3
Bus In bit 5 ground	4
Bus Out bit 6	43
Bus Out bit 6 ground	42
Bus In bit 6	65
Bus In bit 6 ground	64
Bus Out bit 7	1
Bus Out bit 7 ground	2
Bus In bit 7	41
Bus In bit 7 ground	40
Mark 0 Out	29
Mark 0 Out ground	30
Mark 0 In	61

Table 43. System/370 Channel Bus Cable Pin Layout (Type 2644) (continued)

Line Name	Card Connector Pin
Mark 0 In ground	60

System/370 Channel Tag Cable Pin Layout (Type 2644)

In Table 44, the *Card Connector Pin* column identifies the 78-pin connector on the back of the tape I/O processor card (type 2644), which is found in the card enclosure.

Table 44. System/370 Channel Tag Cable Pin Layout (Type 2644)

Line Name	Card Connector Pin
Address Out	17
Address Out ground	18
Address In	39
Address In ground	38
Command Out	37
Command Out ground	36
Status In	77
Status In ground	78
Service Out	73
Service Out ground	74
Service In	55
Service In ground	54
Data Out	33
Data Out ground	32
Data In	15
Data In ground	16
Operational Out	51
Operational Out ground	50
Operational In	59
Operational In ground	58
Select Out	19
Select Out ground	20
Select In	57
Select In ground	56
Hold Out	71
Hold Out ground	72
Disconnect In	53

System/370 Interface

Table 44. System/370 Channel Tag Cable Pin Layout (Type 2644) (continued)

Line Name	Card Connector Pin
Disconnect In ground	52
Suppress Out	75
Suppress Out ground	76
Request In	13
Request In ground	14
Sync	35
Sync ground	34
Clock Out (not used)	70
Clock Out ground (not used)	50
Metering Out (not used)	31
Metering Out ground (not used)	12
Metering In (not used)	11
Metering In ground (not used)	12

Tape I/O Processor Card Connectors

Type 2644

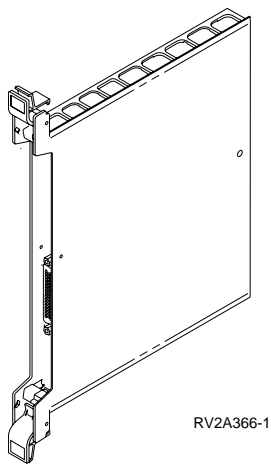


Figure 89. Type 2644 Card Connector

Channel Wrap Block 1

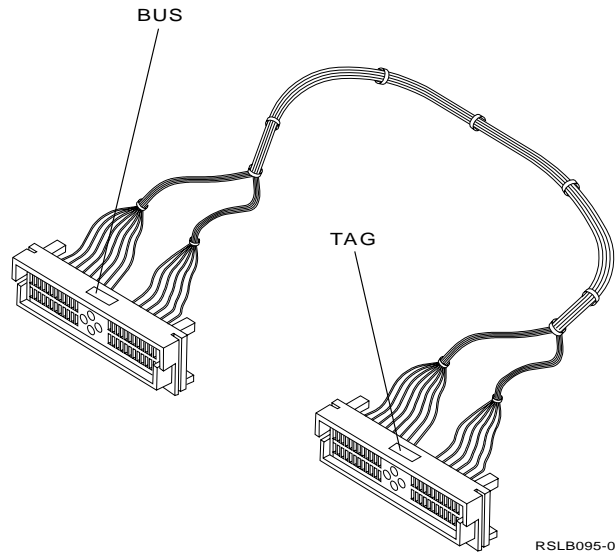
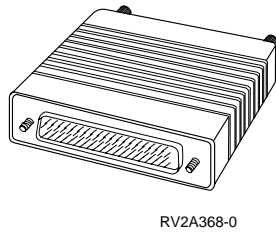


Figure 90. Channel Wrap Block 1, part 62X3403

Channel Wrap Block 2



RV2A368-0

Figure 91. Channel Wrap Block 2, part 6473051

Card and Channel Wrap Layout (Type 2644)

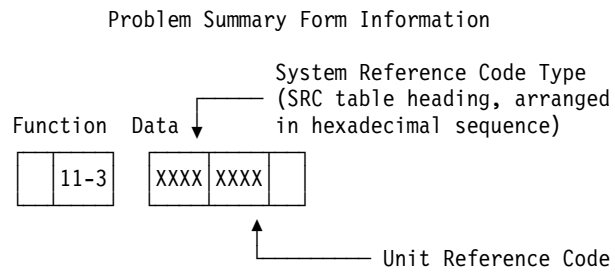


Figure 92. Card and Channel Wrap Layout (Type 2644)

Reclaim Storage

Reclaim IOP Cache Storage

1. If you are not already using dedicated service tools, perform an IPL to DST (see "Dedicated Service Tools (DST)" in the *AS/400 Service Functions* information). If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
2. Reclaim the cache storage by doing the following:
Did you get to DST with a Type D IPL?
Yes No
↓ Go to step 2d of this procedure.
 - a. Select the *Work with disk units* option.
 - b. Select the *Reclaim IOP cache storage* option.
 - c. Follow the on-line instructions to reclaim cache storage. The system will Automatically perform an IPL to a Disk Configuration Warning Report screen. Take the option to display the report. Because the Reclaim Cache Storage was selected after a D-IPL, the system will now require another Reclaim Cache Storage to be performed.
 - d. Select the *Work with disk units* option.
 - e. Select the *Work with disk unit recovery* option.
 - f. Select the *Reclaim IOP Cache Storage* option.
 - g. Follow the on-line instructions to reclaim cache storage. Depending on the reason for performing the Reclaim IOP Cache procedure, there may be a message requiring the ASP be cleared before performing this option, or a message stating the number of lost sectors.

Note: If there are lost sectors, some objects may be damaged. The customer may have to load the damaged objects again. (see the *Backup and Recovery* for more information.)

Note: When the IOP performs a Reset/Reload, if there is a storage IOA attached that is running the local load source, Cxxx xxxx codes will be displayed in the system control panel. The local load source is located in position D01, D02, D03, or D04 for system models 270 and 820 and position D31, D32, D33, or D34 for system models 830, 840, SB2 and SB3. The DST console may then have a blank screen with 01B displayed on the system control panel for up to 15 minutes before it is restored.

This ends the procedure.

Part 3. Appendixes

Appendix A. Problem Summary Form

Use this problem summary form in this appendix to record information displayed on the control panel when a problem occurs on the system.

Note: Determine if the system has logical partitions. Go to "Determining if the System Has Logical Partitions" on page 875, before continuing with this procedure.

If the system has logical partitions, then use this form to record information displayed on either the control panel or the *Work with Partition Status* screen. To access the panel functions of a logically partitioned system go to *AS/400 Service Functions*.

Note: You may copy this form as necessary.

1. Describe the problem.
2. Record the date and time.
3. Record any control panel lights that are on.
 - Power Active
 - Processor Active
 - Attention
4. Does the system have logical partitions?

No **Yes**

↓ Record the following information:

Partition Information	
Partition's ID	
Partition's Name (Not Req'd)	
Partition's State Examples: Failed, Hold, etc.	
Partition's OS/400 Version and Release Example: V4R4	
Record the Date and Time system values set in the partition if possible.	

5. Use the following table to record the information shown for functions 1, 5, 11 through 13, and 20.

Note: If the system has logical partitions and the problem is in a secondary partition, then some of the functions may not be available. Use the system control panel or option 20 on the *Work with Partition Status* screen to record function 20 information.

Note: All functions may not display, depending on the failure.

Functions	Descriptions	SRC Words
Function 1	IPL Mode/Type	
Function 5	Power SRC (if applicable)	
Function 11	SRC word 1, extended SRC characters 9–32	
Function 12	SRC words 2, 3, 4, 5	
Function 13	SRC words 6, 7, 8, 9	
Function 20	System Model, Type, and Processor Feature	

6. Return to the procedure that sent you here.

Appendix B. Preventive Maintenance (PM)

Scheduled preventative maintenance (PM) is no longer required.

Loading and applying all PTFs is the responsibility of the customer. Refer the customer to the *Basic System Operation, Administration, and Problem Handling* book.

Appendix C. Working with Electrostatic Discharge-Sensitive Parts

When holding or installing electrostatic discharge-sensitive (ESD) parts, use the ESD handling kit (IBM* part 6428316) or similar. Read the instructions inside the top cover of the carrying case.

All system logic cards are sensitive to electrostatic discharge (ESD). To prevent damage to ESD-sensitive logic cards, follow these instructions:

- Switch off power to the system or device before removing logic cards.
- Keep the ESD-sensitive card in the original shipping container until you install the card in the machine.
- When holding logic cards, move your body as little as possible to prevent an increase of static electricity from clothing fibers, carpet fibers, and furniture.
- Just before touching the ESD-sensitive card, discharge any static electricity in your body by touching the metal frame or cover of the machine. If possible, keep one hand on the frame when, for example, you are installing or removing a logic card.
- Hold the ESD-sensitive card by the edge or connector shroud cover. Do not touch the pins. If you are removing a field-replaceable module, use the correct tool.
- Return the card to the special container when it is not being used. Do not place the ESD-sensitive card on the machine cover or on a metal table. Machine covers and metal tables are electrical grounds. They make a discharge path from the ESD-sensitive card through your body to ground, increasing the risk of damage to the card. Large metal objects can be discharge paths without being grounded.
- Prevent ESD-sensitive cards from being touched accidentally by other persons. Reinstall machine covers when you are not working on the machine. Do not place unprotected ESD-sensitive cards on a table.
- Be careful when working with ESD-sensitive cards during cold weather heating. Cold weather heating causes low humidity and increases the risk of static electricity.

Appendix D. System Safety Inspection

Introduction

A safety inspection for the system should be performed:

- When it is inspected for an IBM maintenance agreement
- When IBM service is requested and no service has recently been performed by IBM
- When an alterations and attachments review is performed
- When changes have been made to the equipment that might affect its safety

If the inspection indicates safety conditions that are not acceptable, the conditions must be corrected before IBM services the machine.

Note: The correction of any unsafe condition is the responsibility of the owner of the system.

While performing this inspection, special attention must be given to these areas:

- Feature and model changes and engineering change (EC) upgrades
- Additions of non-IBM power supplies or attachments
- Missing safety covers
- Removed, faded, or painted-over safety labels
- Replacement requirements concerning parts for primary power
- Any other items relating to the product's safety

Before you start, you must have completed the *Electrical Safety Education Course for IBM Service Representatives* (self-study course 77170 or equivalent).

You will need these items:

- An IBM service representative tool kit (or equivalent)
- A copy of AS/400 Service Memorandums (SMs), which include engineering change announcements (ECAs) and service aids (SAs) documents for the system
- Latest machine history, if possible
- *Electrical Safety for IBM Service Representatives*, S229-8124
- A Fluke** 8060A digital voltmeter (part 8496278) or equivalent

Perform each safety check on the following pages and place a check mark in front of each item as you complete it.

Covers – All Models

1. Check for damaged or missing covers.
2. Check covers for sharp edges.

AC Power Cord(s) – All Models

1. With machine powered off, remove the power cord from the electrical outlet.
2. Check the power cord and power plug for visible cracks, wear, or damage.

3. Check for 1.0 ohm or less of resistance between the power cord ground and the power supply frame.
4. Ensure that the power cord is fully inserted and secured into position on the machine end.
5. Ensure that the power cord required for your country and system is installed.

AC Safety Grounds

1. Ensure that all power supply mounting screws are tight.
2. Ensure that the mounting screws of the ac module or internal UPS are tight.

Safety Labels

Ensure that all the safety labels are visible and readable:

1. Main power rating attached to the right side frame at the back of the machine.
2. 240 V ac attached to each 23 pin connector (J2 and J3) on ac modules that have SPCN connectors (J15 and J16) (46G3576).
3. Danger up to 240 V ac attached to the bottom frame under the power supplies (46G3575).
4. Weight restriction label attached under the handle on the cover of the External Battery Backup Unit (74F9976).
 1. Main power rating attached to the left side frame at the back of the machine.
 2. Danger up to 240 V ac attached to the bottom frame under each power supply (90H6275).
 3. Caution Lead Acid battery attached to side of internal battery unit (21H7089).
 4. Weight restriction label attached to top of internal battery (74F9976).
 5. Weight restriction label attached to top of power sub-frame assembly (74F9976).
 6. Models 640, 730 and S30 only: Two weight restriction labels attached to SPD/DASD cage sub-frame assembly (74F9976).
 7. Two weight restriction labels attached to active back plane assembly (74F9976).
 8. Main power rating attached to back plate on external battery unit.
 9. Caution lead Acid battery label attached to back plate on external battery unit (21H7089).
 10. Weight restriction label attached to base at rear of external battery unit (74F9978).

Power Off and On (System Unit) – All Models

1. Ensure that the system powers off correctly.
2. Ensure that the system powers on correctly.

Internal Mechanical Inspection

1. Ensure that AMD shields are installed on the ac module AMD assembly.
2. Ensure that the EMC access plate is installed over the power supplies.
3. Ensure that the card retainers are installed on the front and back of the card enclosure.
4. Ensure that the latch to lock the bottom adapter card is installed on all Magnetic Storage IOP (2624) cards with part number 86G8317.

5. Ensure that the safety shield is installed over the left side of the expansion unit AMD assembly.
6. Check the external battery backup power supply cable (if present) for visible cracks, wear, or damage.
1. Models 640, 730, and S30 only: Ensure that the retainer that holds the vertical SPD card separators is in place.
2. Ensure that the vertical rods between DASD units are in place (model 640, 730 and S30 only).
3. Ensure that the EMC access plate is installed over the charger and internal battery unit.
4. Ensure that the EMC access plates are installed over all cages.

Table 45. System Name: (continued)

Status	Resource Name	Type	System DSA	Host System/ Logical Partition	Host Card In DSA	Host Card Out DSA	Attached System/ Logical Partition	Attached Resource Name

Part Number Index

Part Number	Asm-Index	Page	Part Number	Asm-Index	Page	Part Number	Asm-Index	Page
05N6809	8-2	789	1621811	5-42	777	1621838	12-32	807
12K0024	8-7	789	1621811	5-45	777	1621838	7-43	785
12K0032	8-4	789	1621811	5-47	777	1621838	9-18	795
12K0034	8-3	789	1621811	5-49	777	1622677	11-11	803
1621811	1-4	763	1621811	5-51	777	1622677	11-23	803
1621811	1-7	763	1621811	5-8	773	162811	9-20	795
1621811	11-15	803	1621811	6-10	779	16G5609	21-	826
1621811	11-18	803	1621811	6-4	779	16G6496	14-4	811
1621811	11-4	803	1621811	7-11	781	16G8095	21-	826
1621811	12-11	805	1621811	7-13	781	16G8438	21-	827
1621811	12-19	805	1621811	7-18	783	16G8467	21-	827
1621811	12-21	805	1621811	7-25	783	16G8572	21-	827
1621811	12-23	805	1621811	7-28	785	1749352	20-	824
1621811	12-28	805	1621811	7-30	785	17G0574	12-20	805
1621811	12-3	805	1621811	7-32	785	17G0574	13-	809
1621811	12-31	807	1621811	7-35	785	17G1209	12-29	805
1621811	12-34	807	1621811	7-37	785	17G2528	20-	824
1621811	12-36	807	1621811	7-39	785	17G2534	16-5	815
1621811	12-38	807	1621811	7-41	785	17G2641	21-	826
1621811	12-41	807	1621811	7-7	781	17G2642	21-	826
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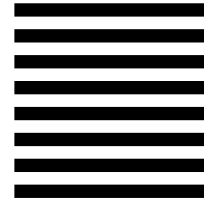
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Glossary

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ac. Alternating current.

adapter card. A smaller card that attaches to a full-size card.

allocate. To assign.

alternative console. A display device assigned by the operating system to function as the console if the console is not working.

American National Standards Institute. An organization sponsored by the Computer and Business Equipment Manufacturers Association for establishing voluntary industry standards.

ANSI. American National Standards Institute. An organization sponsored by the Computer and Business Equipment Manufacturers Association for establishing voluntary industry standards.

APAR. Authorized program analysis report. A request for correction of a problem in a release of an IBM-supplied program.

ASC. Asynchronous.

ASP. Auxiliary storage pool. A group of disk units defined from the auxiliary storage devices. See also *system ASP* and *user ASP*.

authorized program analysis report. A request for correction of a problem in a release of an IBM-supplied program.

auxiliary storage pool. A group of disk units defined from the auxiliary storage devices. See also *system ASP* and *user ASP*.

backplane. A hardware part that has (in one or more planes) logic paths, low-voltage distribution paths, and grounding paths of a section of a machine.

basic assurance test. An automatic testing of a machine when the power is switched on.

BAT. basic assurance test. An automatic testing of a machine when the power is switched on.

battery power unit. A source of electrical power that can be used when the normal utility power fails.

BBBBCCbb. Addressing scheme for the bus (BBBB), card (Cc), and board (bb).

bring up. The process of starting a computer system or a subsystem that is to operate under the control of the system.

BSC. Bisynchronous.

card enclosure. The area in the system unit that contains the logic cards.

CCM. Concurrent maintenance. The process of removing or replacing hardware while the system is in use.

CD. Compact disk; an optical storage medium.

CFIOP. Combined Function Input Output Processor.

concurrent maintenance. The process of removing or replacing hardware while the system is in use.

configure. To describe to a system the devices, optional features, and programs installed on the system.

cryptography. A method of transforming customer data to conceal its meaning. Cryptographic services include data encryption and message authentication.

DASD. Direct access storage device. Also referred to as disk unit.

dc. Direct current.

debug. To check, diagnose, and remove errors in programs.

Glossary

dedicated service tools. The part of the service function used to service the system when the operating system is not working.

device parity protection. A function that protects data stored on a disk unit subsystem from being lost because of the failure of a single disk unit in the disk unit subsystem. When a disk unit subsystem has device parity protection and one of the disk units in the subsystem fails, the system continues to run. The disk unit subsystem reconstructs the data after the disk unit in the subsystem is repaired or exchanged.

DFCI. Disk file control interface.

DIMM. Dual in-line memory module.

disk enclosure. The part of a disk unit that contains the read and write heads, the magnetic disks, and the actuators.

download. To transfer data from a processing unit to an attached device, such as a microcomputer, for processing.

DST. Dedicated service tools. The part of the service function used to service the system when the operating system is not working.

EMC. Electromagnetic compatibility.

EMI. Electromagnetic interference.

EPO. Emergency power-off.

ERC. Extended reference code

ESD. Electrostatic discharge.

expansion unit. An expansion unit contains I/O hardware such as cards, tapes and disk units. The system may have multiple expansion units.

An expansion unit can be bolted directly to the side of a system unit and is contained within the system unit covers.

An expansion unit can also be mounted on top of a rack or tower and has its own covers.

Internal signal cables interconnect the expansion unit to the system unit, rack, or tower.

FAX. Facsimile machine.

FC. Feature code.

FDS. Flexible distribution system.

FRU. Field-replaceable unit.

GND. Ground (electrical).

HSL. High Speed Link. This is the connectivity hardware and cables for connecting I/O and other processor units to a system processor.

HSL Ring. High Speed Link Ring (shown as "System Interconnect" on the display). This is a logical ring of HSL connections originating from the HSL Controller of a processor unit, sequentially connecting I/O or other processor units and ending back at the HSL Controller where the ring originated.

ID. Identification.

input/output processor. A device that processes programmed instructions and controls one or more I/O devices or adapters.

INS. Integrated Netfinity Server for AS/400

I/O. Input/output.

IOA. Input/output adapter.

IOP. Input/output processor. A device that processes programmed instructions and controls one or more I/O devices or adapters.

IPL. Initial program load.

LAN. Local area network. A computer network located on a user's premises within a limited geographical area.

LIC. Licensed Internal Code.

license. A permission granted by competent authority to engage in a business or occupation or in an action otherwise unlawful.

Licensed Internal Code. Programming that defines logical operations on data.

LICTR. Licensed Internal Code trouble report.

local area network. A computer network located on a user's premises within a limited geographical area.

logo. An identifying statement.

media. Magnetic disks or tapes and compact disks (CD).

Multi-adapter bridge domain. This is the set of all card locations controlled by one multi-adapter bridge.

Multi-adapter bridge Function. This identifies a single PCI adapter card location under an multi-adapter bridge. The multi-adapter bridge function number is part of the Direct Select Address for a PCI I/O adapter. The multi-adapter bridge number and the multi-adapter bridge function number together indicate a unique card location connected to a given system PCI bus. The bus number and the multi-adapter bridge number and the multi-adapter bridge function number together identify a unique PCI I/O resource in the system.

MES. Miscellaneous equipment specification.

The process of either an upgrade of your existing system or moving parts from an existing system to a new system, are called miscellaneous equipment specification (MES).

MFIOP. Multiple Function I/O Processor.

mirrored protection. A function that protects data by duplicating all disk unit data on one storage unit in an auxiliary storage pool to another storage unit in the same auxiliary storage pool.

MSD. Main store dump.

MSIOP. Magnetic Storage I/O Processor.

Multi-adapter Bridge. This is a PCI bridge resource in the I/O hardware which provides for the connection of PCI adapters to the system PCI I/O bus. Each PCI adapter connected under an multi-adapter bridge is controlled individually by the multi-adapter bridge. The multi-adapter bridge number identifies an multi-adapter bridge on a given system PCI I/O bus and is part of the Direct Select Address for a PCI I/O adapter. The bus number and the multi-adapter bridge number together identify a unique multi-adapter bridge in the system.

OEM. Original equipment manufacturer.

odd/even bus pair. An optical link card supports a pair of buses; one has an even number and the other has an odd number (for example, bus 2 and 3).

optical redundancy. A second optical path used to keep the system operational when a hardware failure occurs.

overview. A general survey or summary.

PAR. Problem analysis and resolution.

PCC. Power control compartment.

PIP. Problem isolation procedure. Written information used by service representatives to repair IBM equipment. A problem isolation procedure contains actions and yes/no questions that send the user to the failing part of the equipment.

plenum. A space used for environmental air.

PM. Preventive maintenance.

pool. (1) A readily available supply. (2) A designated place to store data.

power off. To turn off the power.

power on. To turn on the power.

primary link. The optical connection between a local optical link card and a remote bus adapter card.

problem isolation procedure. Written information used by service representatives to repair IBM equipment. A problem isolation procedure contains actions and yes/no questions that send the user to the failing part of the equipment.

program temporary fix. A temporary solution to, or bypass of, a problem in a licensed program.

PTF. Program temporary fix. A temporary solution to, or bypass of, a problem in a licensed program.

rack. Used on early models of the AS/400, such as models C, D, E, and F, as either a system unit or for I/O hardware such as cards, tapes and disk units. External signal cables interconnect the system unit to the racks that contain I/O hardware.

A rack can be either 1.0 meters or 1.6 meters in height and usually has white covers for AS/400 systems.

Typically, feature codes with numbers less than 5050 are considered "racks" and codes greater than 5050 are considered "towers."

reallocate. To allocate again.

restore. To return to an original value or image; for example, to restore data to main storage from auxiliary storage.

SAL. Service action log

SAVSYS tape. A tape that is generated by the SAVSYS command, on which system data is recorded and saved.

SCSI. Small Computer System Interface

SDIOP. Storage Device I/O Processor.

secondary link. The optical connection between two remote bus adapter cards.

sign-on. The procedure by which the user starts working at a workstation.

SIMM. Single in-line memory module.

single bus connection. Only one bus is connected to the optical link card. One connector is not used.

SPCN. System Power Control Network.

SPD bus. An AS/400 input/output bus architecture.

SRC. System reference code. A group of characters that identifies the machine status or a specific error condition. The system reference code can be displayed on the console from the problem log.

system ASP. The auxiliary storage pool where system programs and data reside. It is the storage pool used if a storage pool is not defined by the user. See also *auxiliary storage pool* and *user ASP*.

Glossary

system reference code. A group of characters that identifies the machine status or a specific error condition. The system reference code can be displayed on the console from the problem log.

tower. A frame-like structure that, since the introduction of the 3xx/4xx models, has been used to repack devices formerly housed in racks. Towers provide the equivalent function of racks and have since replaced racks.

A tower can be used for either the system unit or for system expansion. The system unit always contains the processor(s). Towers are standalone and usually have black covers. Like racks, towers can vary in height.

UEPO. Unit emergency power-off.

upgrade. To change the system configuration to a later level.

URC. Unit reference code. Last 4 characters of SRC.

user ASP. One or more auxiliary storage pools used to isolate journals, journal receivers, and save files from the other system objects stored in the system ASP. See also *auxiliary storage pool* and *system ASP*.

vital product data. A structured description of a device or program. For devices, it is recorded in the device at manufacture and includes at least the type, model, serial number, and installed features. It may include the manufacturer's ID and other fields. For programs, it is compiled as a data area accompanying the program and includes the name of the licensed program or Licensed Internal Code group, the release and modification, the program module names, the national language or languages selected, and possibly other fields. Vital product data is transferred from the device to the system and is retained for display. Vital product data is also visible on the device name plate or a similar tag.

VLIC. Vertical Licensed Internal Code.

VPD. See *vital product data*.

workstation I/O processor. An I/O processor card in the card enclosure that provides the direct connection of local workstations to the system.

WSIOP. Workstation I/O processor. An I/O processor card in the card enclosure that provides the direct connection of local workstations to the system.

X.25. In data communications, a specification of the CCITT that defines the interface to an X.25 (packet-switching) network.



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