



Supplement to the RS/6000 Enterprise Server S70:

# User's Guide and Installation and Service Guide

*User's Guide (SA38-0549-00), and Installation and Service Guide (SA38-0548-00)*

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Supplement to the RS/6000 Enterprise Server S70:

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**Note**

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**First Edition (December 1997)**

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## About This Book

This supplement provides updates to the S70 system *User's Guide* and *Installation and Service Guide*. Updates have been made to "Introduction to Diagnostics," "Error Code to FRU Index" "Maintenance analysis procedures (MAPs)" "Parts," and appendices for the service processor and related functions.

The updated sections of the books are duplicated in this supplement and where changes have been made, a vertical bar (|) appears in the left margin.

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## Related Publications

This book provides updates to the S70 system *User's Guide* and *Installation and Service Guide* that came with your system.

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## ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

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## Update 1

This section contains updates made to:

- *S70 Installation and Service Guide*, "Chapter 2, System Installation Procedure."

The following page is an update to page 2-1 of the *Installation and Service Guide*.



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## 1. System Installation Procedure

Follow the procedures in this chapter to install the S70. The estimated installation time for the S70 is:

**Install Activity**      3.5 Hours

**Planning Activity**    2.0 Hours

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**Total Time**            5.5 Hours

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### Step 1. Inventory

- \_\_\_ • The *About Your Machine* listing (in a plastic bag attached to the outside of the carton). Check the listing to verify that you have all the items shipped with the system.
- \_\_\_ • AIX Operating System publications
- \_\_\_ • *RS/6000 Enterprise Server S70 User's Guide*
- \_\_\_ • *RS/6000 Enterprise Server S70 Installation and Service Guide* (this book)
- \_\_\_ • *Diagnostic Information for Multiple Bus Systems*
- \_\_\_ • *RS/6000 Adapters, Devices, and Cable Information for Multiple Bus Systems*
- \_\_\_ • *PCI Adapter Placement Reference*
- \_\_\_ • *System Unit Safety Information*
- | \_\_\_ • *Service Director for RS/6000 CE Information Guide*
- \_\_\_ • Support Information and Warranty

Verify with the customer that the following items are available. You will need them to complete this installation.

1. A floor plan, showing where to place each rack.
2. A console, including cables and a power source.
3. A modem for the electronic customer support function (if the customer ordered this function). This includes the correct telephone jack, cables, and a power source.

| (The following information is added to page 2-37 of the *Installation and Service*  
| *Guide*.)

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| **Step 17. Service Processor Setup and Test**

| Refer to “Service Processor Setup and Test” on page 161 of this supplement and  
| perform the steps necessary to setup and test the service processor, then return  
| here.



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### **Step 18. Install the Service Director**

Refer to *Service Director For RS/6000 CE Information Guide* and perform the steps necessary to install the Service Director for RS/6000, then return here.

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### **Step 19. Finishing the Installation**

- \_\_\_ 1. Record the System Identification numbers.

The system has important identification information that you might need if you have it serviced. Record this information in the appendix of the *RS/6000 Enterprise Server S70 User's Guide*.

- \_\_\_ 2. If you decided to delay installing any optional devices, you might want to install these now.

Some options you might install come with a diskette that contains device drivers, configuration files, or test programs. To install these files (after the operating system is installed), follow the instructions that came with the option.

- \_\_\_ 3. To install application programs, follow the instructions supplied with each application program.

If any failures occur, refer to "Maintenance Analysis Procedures" on page 11 of this supplement.



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## Update 2

This section contains updates made to:

- *S70 Installation and Service Guide*, "Chapter 3, Introduction to Diagnostics."

The following information is added to page 3-4 of the *Installation and Service Guide*.

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### **Service Director for the RS/6000**

| Service support for the S70 may be enhanced through the use of the application  
| program, Service Director for the RS/6000. This application provides a number of  
| advantages for the S70 customer including automatic error reporting and analysis  
| without customer intervention. The service director kit ships with the Enterprise  
| Server S70 and includes the following:

- | • Service Director for the RS/6000 program on diskette
- | • The appropriate modem for remote communication
- | • Applicable cables
- | • The *CE Information Guide* for Service Director.

| Please refer to the CE information Guide for more details on Service Director for the  
| RS/6000.



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## Update 3

This section contains updates made to the *S70 Installation and Service Guide*, “Chapter 4, Maintenance Analysis Procedures (MAPs).”



## 2. Maintenance Analysis Procedures (MAPs)

### Entry MAP

Use the following table to determine your starting point.

When possible, run Online Diagnostics in Service Mode. Online Diagnostics perform additional functions, compared to Standalone Diagnostics. This ensures that the error state of the system is captured in NVRAM for your use in fixing the problem. The AIX error log and SMIT are only available when diagnostics are run from the hard drive.

#### Notes:

1. When eight digits are displayed in the operator panel, additional information can sometimes be obtained by looking at the system reference codes in function 11 to 19. See "Operator Panel Functions" on page 147 of this supplement.
2. Licensed programs frequently rely on network configuration, and system information stored on the VPD on the operator panel control assembly. If the MAPs indicate that the Operator Panel Control Assembly should be replaced, call technical support for recovery instructions. If recovery is not possible, notify the system owner that new keys for licensed programs may be required.
3. If a network adapter is replaced, the network administrator must be notified so that the client IP addresses used by the server can be changed. In addition, the operating system configuration of the network controller may need to be changed in order to enable system startup. Also check to ensure that any client or server that addresses this system is updated.

Symptom	Starting Point
You have a problem that does not prevent the system from booting.	Go to the Fast Path MAP in the <i>Diagnostic Information for Multiple Bus Systems</i> .
A Green Power LED on an I/O Drawer Indicator Panel is not on.	Go to "MAP 1520: Power" on page 23.
You do not have a symptom.	Go to MAP 0020 in the <i>Diagnostic Information for Multiple Bus Systems</i>
You have an SRN.	Go to the Fast Path MAP in the <i>Diagnostic Information for Multiple Bus Systems</i> .
The system stops and a 3-digit number is displayed in the operator panel display.	Record SRN 101-xxx, where xxx is the 3-digit number displayed in the operator panel display, then go to the Fast Path MAP in the <i>Diagnostic Information for Multiple Bus Systems</i> .
The system will not boot.	Go to "Quick Entry MAP" on page 12.

---

## Quick Entry MAP


### Quick Entry MAP Table of Contents

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Power and Cooling Problems	14
Flashing 888 in Operator Panel Display	14
Other Symptoms or Problems	14



Symptom	Action
<b>Service Actions</b>	
You have parts to exchange or a corrective action to perform.	<ol style="list-style-type: none"> <li>1. Go to the <i>Removal and Replacement Procedures</i>.</li> <li>2. Go to the <i>Repair Checkout Procedure</i> in the <i>Diagnostic Information for Multiple Bus Systems</i>.</li> </ol>
You need to verify that a part exchange or corrective action corrected the problem.	Go to the <i>Repair Checkout Procedure</i> in the <i>Diagnostic Information for Multiple Bus Systems</i> .
You need to verify correct system operation.	Go to the <i>System Checkout Procedure</i> in the <i>Diagnostic Information for Multiple Bus Systems</i> .
<b>8-Digit Error Codes</b>	
You have an 8-digit error code displayed.	Look up the error code in the table in Chapter 6. on page 6-1 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> .
<b>System Stops With an 8-Digit Number Displayed</b>	
The system stops with an 8-digit error code displayed when booting.	Record the error code. Go to Chapter 6. on page 6-1 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> .
<b>System Stops With a 4-Digit Number Displayed</b>	
The system stops with a 4-digit error code and the first digit is "E."	Go to Chapter 5 on page 5-1 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> .
The system stops with a 4-digit error code and the first digit is not "E."	Take the last 3 digits and put 101- on the left to make an SRN. Go to <i>Diagnostic Information for Multiple Bus Systems</i> .
<b>There Appears to be a Display Problem (Distortion, Blurring, Etc.)</b>	

Symptom	Action
All display problems.	<ol style="list-style-type: none"> <li>1. If using a graphics display:               <ol style="list-style-type: none"> <li>a. Go to the <i>Problem Determination Procedures</i> for the display.</li> <li>b. If you do not find a problem, replace the display adapter.</li> <li>c. If you do not find a problem, suspect the I/O planar. Go to "MAP 1540: Minimum Configuration" on page 71.</li> </ol> </li> <li>2. If using an ASCII terminal:               <ol style="list-style-type: none"> <li>a. Make sure that the ASCII terminal is connected to S1.</li> <li>b. If problems persist, go to the <i>Problem Determination Procedures</i> for the terminal.</li> <li>c. If you do not find a problem, replace the Service Processor card.</li> <li>d. If you do not find a problem, suspect the I/O planar. Go to "MAP 1540: Minimum Configuration" on page 71.</li> </ol> </li> </ol>
<b>Power and Cooling Problems</b>	
You cannot power on the system.	Go to "MAP 1520: Power" on page 23.
The power light does not come on or stay on. (both the operator panel power-on LED and the I/O Drawers indicator panel power LEDs do not come on or stay on).	Go to "MAP 1520: Power" on page 23.
An Input/Output Rack or a rack mounted unit will not power on.	Go to "MAP 1520: Power" on page 23.
You have a power problem or there is an SRC in function 5 (05-1xxx-xxxx).	Go to "MAP 1520: Power" on page 23.
The system attention LED on the operator panel is on but there is no SRC displayed in function 11-3 on the control panel.	Go to "MAP 1520: Power" on page 23.
<b>Flashing 888 in Operator Panel Display</b>	
A flashing 0888 or 888 is displayed in the operator panel display.	Go to the Fast Path MAP in the <i>Diagnostic Information for Multiple Bus Systems</i> .
<b>Other Symptoms or Problems</b>	
The operator panel displays only the yellow background light. Fans and blowers are off.	The Service Processor (SP) is ready. The system is waiting for power on.

Symptom	Action
<p>All of the system POST indicators are displayed on the system console, the system pauses and then restarts. The term "POST indicators" refer to the icons (graphic display) or device mnemonics (ASCII terminal) that appear during the power-on self-test (POST).</p>	<p>Go to "Boot Problems" on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i>.</p>
<p>The system stops and all of the POST indicators are displayed on the system console. The term "POST indicators" refer to the icons (graphic display) or device mnemonics (ASCII terminal) that appear during the power-on self-test (POST).</p>	<p>Go to Chapter 5 on page 5-1 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> to isolate the problem.</p>
<p>The system stops and the message "STARTING SOFTWARE PLEASE WAIT..." is displayed on the ASCII terminal, or the boot indicator  is displayed on a graphics terminal.</p>	<p>Go to Chapter 5 on page 5-1 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i>.</p>
<p>The system does not respond to the password being entered or the system login prompt is displayed when booting in service mode.</p>	<ol style="list-style-type: none"> <li>1. If the password is being entered from a keyboard attached to the system, then the keyboard or its controller may be faulty. In this case, replace these parts in the following order: <ol style="list-style-type: none"> <li>a. Keyboard cable</li> <li>b. Keyboard</li> <li>c. Service Processor card</li> </ol> </li> <li>2. If the password is being entered from an ASCII terminal, then use the <i>Problem Determination Procedures</i> for the ASCII terminal. Make sure the ASCII terminal is connected to S1. <p>If the problem persists, replace the Service Processor card.</p> </li> </ol>
<p>No codes are displayed on the operator panel within a few seconds of turning on the system. The operator panel is blank before the system is powered on.</p>	<p>Reseat the operator panel cable.</p> <p>If problem not resolved, replace in order:</p> <ol style="list-style-type: none"> <li>1. Operator Panel Assembly. Update the VPD information in the new operator panel.</li> <li>2. Service Processor card (See notes on 11.)</li> </ol>

Symptom	Action
<p>The SMS configuration list or Boot sequence selection menu shows more SCSI devices attached to a controller/adaptor than are actually attached.</p>	<p>A device may be set to use the same SCSI bus ID as the control adaptor. Note the ID being used by the controller/adaptor (this can be checked and/or changed via an SMS utility), and verify that no device attached to the controller is set to use that ID.</p> <p>If settings do not appear to be in conflict:</p> <ol style="list-style-type: none"> <li>1. Replace the SCSI cable.</li> <li>2. Replace the device.</li> <li>3. Replace the SCSI adaptor</li> </ol> <p><b>Note:</b> In a "Twin-tailed" configuration where there is more than one initiator device (normally another system) attached to the SCSI bus, it may be necessary to change the ID of the SCSI controller or adaptor with the System Management Services.</p>
<p>The System Management Services menu is displayed.</p>	<p>The device or media you are attempting to boot from may be faulty.</p> <ol style="list-style-type: none"> <li>1. Check the SMS error log for any errors. To check the error log: <ul style="list-style-type: none"> <li>• Choose error log</li> <li>• If an error is logged, check the time stamp.</li> <li>• If the error was logged during the current boot attempt, record it.</li> <li>• Look up the error in Chapter 6 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i>. and do the listed action.</li> <li>• If no recent error is logged in the error log, continue to the next step below.</li> </ul> </li> <li>2. Try to boot from an alternate boot device connected to the same controller as the original boot device. If the boot succeeds, replace the original boot device (for removable media devices try the media first).</li> <li>3. Go to "MAP 1540: Minimum Configuration" on page 71.</li> </ol>
<p>You suspect a cable problem.</p>	<p>Go to the <i>RS/6000 Adapters, Devices, and Cable Information for Multiple Bus Systems</i>.</p>
<p>All other problems.</p>	<p>Go to "MAP 1020: Problem Determination" on page 17.</p>

---

## MAP 1020: Problem Determination

### Purpose of This MAP

Use this MAP to get an error code if you were not provided one by the customer or you are unable to load diagnostics. If you are able to load the diagnostics, go to MAP 0020 in the *Diagnostic Information for Multiple Bus Systems*.

The Service Processor may have recorded one or more symptoms in its error log. It is a good idea to examine that error log before proceeding (see “System Information Menu” on page 184).

Be prepared to record code numbers and use those numbers in the course of analyzing a problem. Go to “Step 1020-1” on page 18.

The Service Processor may have been set by the user to monitor server operations and to attempt recoveries. You may wish to disable these actions while you diagnose and service the system. If the system was set up according to the recommendations of the *RS/6000 Enterprise Server S70 User's Guide*, all the settings of the Service Processor (except Language) were saved by using the SAVE/RESTORE HARDWARE MAINTENANCE POLICIES Service Aid. You may use that same Service Aid to restore the settings at the end of your service action.

Just in case the Service Processor settings were not saved by the user, if you disable them, you should make notes of their current settings for restoration before you leave.

In addition to the parameters in the table below, you may wish to disconnect the modem to prevent incoming signals that could cause the S70 to power on.

Following are the Service Processor settings of your interest. The Service Processor menus are described in “Service Processor Menus” on page 171.

Surveillance	From the Service Processor Setup Menu, go to the Surveillance Setup Menu and disable surveillance.
Unattended Start	From the Service Processor System Power Control Menu, disable unattended start mode.
Reboot Policy	From the System Power Control Menu, go to the Reboot/Restart Policy Setup Menu and set: <ol style="list-style-type: none"><li>1. Number of reboot attempts to <b>0</b> (zero)</li><li>2. Use OS-Defined restart policy to <b>No</b></li><li>3. Enable supplemental restart policy to <b>No</b>.</li></ol>

Call Out	From the Call-In/Call-Out Setup Menu, go to the Serial Port Selection Menu and disable call-out on both serial ports.
----------	---

Another feature that could disrupt a service action by powering the S70 on is an AIX function called “Timed Power-On.” If you think it should be turned off during your service action, refer to the “System Power-On Methods” in the *System User’s Guide: Operating System and Devices* (order number SC23-4121).

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### Step 1020-1

The following steps analyze a failure to load the diagnostic programs.

**Note:** You are asked questions regarding the operator panel display. You are also asked to perform certain actions based on displayed POST indicators. Please be observant of these conditions.

1. Power off the system. Refer to “Powering Off the System” on page 9-4 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*.
2. Power on the system. Refer to “Powering On the System” on page 9-5 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*.
3. Insert the diagnostic CD-ROM into the CD-ROM drive.
4. When the keyboard indicator is displayed (the word **keyboard** on an ASCII terminal or the keyboard icon on a graphical display), press the F5 key on the directly-attached keyboard or the number 5 key on an ASCII terminal.
5. Enter a password, if requested.
6. Wait until the diagnostics are loaded or the system appears to stop.
7. Find your symptom in the following table; then follow the instructions given in the Action column.

Symptom	Action
The system stopped and a code is displayed on the operator panel.	Go to the "Entry MAP" on page 11.
The system stops with a prompt to enter a password.	Enter the password. You are not allowed to continue until a correct password has been entered. When you have entered a valid password go to the beginning of this table and wait for one of the other conditions to occur.
The diagnostic operating instructions are displayed.	Go to MAP 0020 in the <i>Diagnostic Information for Multiple Bus Systems</i> .
The power good LED does not come on or does not stay on or you have a power problem.	Go to "MAP 1520: Power" on page 23.
The system login prompt is displayed.	<p>You may not have pressed the correct key or you may not have pressed the key soon enough when you were to indicate a Service Mode IPL of the diagnostic programs. If this was the case start over at the beginning of this Step.</p> <p><b>Note:</b> Perform the systems shutdown procedure before turning off the system.</p> <p>If you are sure you pressed the correct key in a timely manner, go to "Step 1020-2" on page 21.</p>
The system does not respond when the password is entered.	Go to "Step 1020-2" on page 21.
The system stopped and a POST indicator is displayed on the system console and an eight-digit error code is not displayed.	<p>If the POST indicator represents:</p> <ol style="list-style-type: none"> <li>1. Memory, go to "MAP 1540: Minimum Configuration" on page 71.</li> <li>2. Keyboard <ol style="list-style-type: none"> <li>a. Replace the keyboard cable.</li> <li>b. Replace the keyboard.</li> <li>c. Replace the Service Processor card.</li> <li>d. Go to "MAP 1540: Minimum Configuration" on page 71</li> </ol> </li> <li>3. Network, go to "MAP 1540: Minimum Configuration" on page 71.</li> <li>4. SCSI, go to "MAP 1540: Minimum Configuration" on page 71.</li> <li>5. Speaker <ol style="list-style-type: none"> <li>a. Replace the speaker.</li> <li>b. Replace the Service Processor card.</li> <li>c. Go to "MAP 1540: Minimum Configuration" on page 71</li> </ol> </li> </ol>
The System Management Services menu is displayed	Go to "Step 1020-4" on page 22.

<b>Symptom</b>	<b>Action</b>
All other symptoms.	If you were directed here from the Entry MAP, go to "MAP 1540: Minimum Configuration" on page 71. Otherwise, find the symptom in the "Entry MAP" on page 11.



---

## Step 1020-2

There is a problem with the keyboard.

Find the type of keyboard you are using in the following table; then follow the instructions given in the Action column.

Keyboard Type	Action
Type 101 keyboard (U.S.). Identify by the size of the Enter key. The Enter key is in only one horizontal row of keys.	Record error code M0KBD001; then go to "Step 1020-3."
Type 102 keyboard (W.T.). Identify by the size of the Enter key. The Enter key extends into two horizontal rows.	Record error code M0KBD002; then go to "Step 1020-3."
Type 106 keyboard. (Identify by the Japanese characters.)	Record error code M0KBD003; then go to "Step 1020-3."
ASCII terminal keyboard	Go to the documentation for this type of ASCII terminal and continue problem determination.

---

## Step 1020-3

Take the following actions:

1. Find the eight-digit error code in Chapter 6 on page 6-1 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*.

**Note:** If the eight-digit error code is not listed in Chapter 6 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*, look for it in the following:

- Any supplemental service manuals for attached devices
- The diagnostic problem report screen for additional information
- The Service Hints service aid
- The CEREADME file (by using the Service Hints service aid).

**Note:** Service aids can be found in *Diagnostic Information for Multiple Bus Systems*.

2. Perform the action listed.

---

### Step 1020-4

1. Turn off, then turn on the system unit.
2. When the keyboard indicator appears, press the F1 key on a directly attached keyboard or the 1 key on an ASCII terminal.
3. When the System Management Services appear, check the error log for any errors.
  - Choose Error Log
  - If an error is logged, check the time stamp.
  - If the error was logged during the current boot attempt, record it.
  - Look up the error in Chapter 6 on page 6-1 of the *RS/6000 Enterprise Server S70 Installation and Service Guide* and do the listed action.
  - If no recent error is logged in the error log, go to “MAP 1540: Minimum Configuration” on page 71.

---

## **MAP 1520: Power**

This procedure is used to locate power problems in the System Rack or Input/Output Rack. If a problem is detected, this procedure helps you isolate the problem to a failing unit.

Observe the following safety notices during service procedures.

### **DANGER**

**An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.**

**Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.**

**When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.**

**Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.**

**During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.**

### **CAUTION:**

**This product is equipped with a three-wire power cable and plug for the user's safety. Use this power cable with a properly grounded electrical outlet to avoid electrical shock.**

### **CAUTION:**

**This unit has more than one power supply cord. To reduce the risk of electrical shock, disconnect two power supply cords before servicing.**

### **CAUTION:**

**Energy hazard, remove power before servicing. Disconnect two power supply cords.**

Find the symptom in the following table; then follow the instructions given in the Action column.

Symptom	What You Should Do
<b>Power Problems</b>	
The system attention LED on the operator panel is on, there may or may not be an error code displayed on the operator panel.	In addition to function 11, error codes can also appear in function 5. Look at function 5 and record the error code shown. Go to “(1xxx) System Power Control Network (SPCN) Reference Codes” on page 91 and find the reference code.
System Rack does not become powered on	Go to “Cannot Power On System Rack (No Error Code)” on page 25.
I/O Drawer does not become powered on (Input/Output Rack Power light at the power distribution bus is not on).	Go to “Cannot Power On Input/Output Rack (No Error Code)” on page 34.
Input/Output Racks became powered on, but one or more rack-mounted units do not become powered on (no error code).	Go to “Input/Output Rack Becomes Powered On, But A Rack Mounted Unit Does Not Become Powered On” on page 43
The System Rack, Input/Output Rack, or a rack mounted unit does not become powered off.	Go to “System Rack, I/O Rack, or Rack Mounted Unit Cannot Become Powered Off” on page 47.
You have been directed here by the SRC tables, the SRC is 1xxx1200.	Go to “The SRC Table Has Directed You Here and the SRC is 1xxx1200” on page 49.
You have been directed here by the SRC tables, the SRC is 1xxx120y, where y=1-6.	Go to “The SRC Table Has Directed You Here and the SRC is 1xxx120y or 1xxx140y” on page 54.
You have been directed here by the SRC tables, the SRC is 1xxx140y, where y=1-6.	Go to “The SRC Table Has Directed You Here and the SRC is 1xxx120y or 1xxx140y” on page 54.
You have been directed here by the SRC tables, the SRC type is 1xxx, and the reference code is 6018, 6118, 6218, 6318, 631A, 633A, 6518, 6618, 6718, 671A, 6A18, 6x38 or CE19.	Go to “Regulator Problem Isolation” on page 61.
You have been directed here by the SRC tables, the SRC is 1xxx640x.	Go to “Power Good Problem Isolation” on page 64.
You have been directed here by the SRC tables, the SRC type is 1xxx and the reference code is 7201 or 7300.	Go to “AC Box (or DC Box, If -48 V dc System) Problem Isolation” on page 67.

## Cannot Power On System Rack (No Error Code)

To correct the power-on problem, perform this procedure until the problem is corrected and you can power on the system.

The following steps are for the System Rack, unless other instructions are given.

1. Attempt to power on the system (see “Powering Off and Powering On the System” on page 9-4 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).

### Does the system power on?

**No**    **Yes**

↓    Go to step 12 of this procedure.

2. **Is the background light for the Data display on the operator panel on?**

**Note:** The background light is a dim (yellow) light in the Data area on the control panel.

**No**    **Yes**

↓    Go to step 8 of this procedure.

- 3.

**Note:** Read the Danger and Caution notices under “Safety Notices” on page xv of the *RS/6000 Enterprise Server S70 Installation and Service Guide* before continuing with this procedure.

Perform the following:

- a. Disconnect the AC power cable from the customer’s AC power source.

(For **-48 V dc systems**, disconnect power by setting all circuit breakers to the Off position, then disconnecting the power cables from the top and bottom connectors on the DC box.

Remove the cover from the power distribution assembly exposing the circuit breaker panels.)

- b. Use a multimeter to measure the AC voltage at the customer’s AC power source.

(If **-48 V dc system**, using a multimeter, measure the input voltage from the customer supplied power cables. Check between **ALL** -48 V dc supply and return cables for -40 to -60 V dc. See the figure on page 1-40 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*.)

**Note:** There is one AC power cable for each System Rack or Input/Output Rack.

(-48 V dc systems have multiple DC power cables for each rack) Disconnect all the AC power cables and measure the AC voltage at all AC power outlets before answering the following question.

**Is the AC voltage from 200 V ac to 240 V ac?  
(Is the DC voltage from -40 to -60 V dc?)**

**Yes No**

↓ Perform the following:

1. Inform the customer that the AC voltage at the AC power outlet is not correct.  
  
(If **-48 V dc system**, inform the customer that the DC voltage on the customers -48 V dc supply is not correct.)
2. **-48 V dc systems only:** If the customer voltage is correct with the -48 V dc leads disconnected from the S70, a problem could exist in a circuit breaker panel or in one of the two DC cables supplying power to the DC box.
3. Disconnect all leads (the cables that connect from the circuit breaker panel to the DC box) from the output side of the circuit breaker panel in question.

Reconnect the -48 V dc leads from the customer's supply to the circuit breaker panel input connectors.

Measure the input voltage from the customer supplied DC feed.

**Is the voltage between -40 and -60 V dc?**

**Yes No**

↓ Replace the circuit breaker panel.

**This ends the procedure.**

Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

4. Check for possible faulty breaker operation. Do all breakers turn on and off properly, verify breaker with multimeter voltage reading. Check for possible shorted DC cable.
5. Reconnect the AC power cables to the power source when the AC voltage at the power source is correct.

(If **-48 V dc system**, set all circuit breakers to the Off position, reconnect any disconnected DC power cables, and reinstall the cover plate on the power distribution assembly. Have the customer apply power and set all the circuit breakers to the On position.)

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

**Are all circuit breakers reset at the Input/Output Rack PDB (or DC circuit breaker panels on the top of the System Rack and Input/Output Rack, if -48 V dc system)?**

**Yes No**

↓ Reset the popped circuit breaker.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

**4. Are the AC power cables from the AC box to the customer's AC power outlet connected and seated correctly at both ends?**

**(If -48 V dc system, are the two cables from the circuit breaker panel to the DC box seated correctly? See the figure on page 1-40 of the *RS/6000 Enterprise Server S70 Installation and Service Guide for DC cabling*.)**

**Yes No**

↓ Perform the following:

1. Connect the AC (or DC, if -48 V dc system) power cables correctly at both ends. Set the circuit breakers to the Off position while disconnecting cables, then back to the On position.
2. Go to step 1 of this procedure.

5.

**Note:** Read the Danger and Caution notices under "Safety Notices" on page xv of the *RS/6000 Enterprise Server S70 Installation and Service Guide* before continuing with this procedure.

Perform the following:

- a. Disconnect the AC (or DC, if -48 V dc system) power cables from the AC box (or DC box, if -48 V dc system).

**Note:** Set the circuit breakers to the Off position while disconnecting cables, then back to the On position.

- b. Use a multimeter to measure the AC (or DC, if -48 V dc system) voltage at the AC box (or DC box, if -48 V dc system) end of the power cables.



6. Is the AC voltage from 200 V ac to 240 V ac  
(Is the DC voltage -40 to -60 V dc on -48 V dc systems)?

Yes No

↓ Perform the following:

1. Exchange the AC power cable

(if you are working on a **-48 V dc** powered system, perform the following:

- Verify that all circuit breakers are in the On position.
- Having verified the breakers were in the correct position, now set all circuit breakers to the Off position and verify that all cables between the circuit breaker panels and the DC box have good continuity.

If you cannot find a problem with the cables or circuit breakers, replace the failing circuit breaker panel.)

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

2. Go to step 1 of this procedure.

7. Perform the following:

- a. Disconnect the AC power cable from the customer's AC power outlet

(if **-48 V dc system**, disconnect the -48 V dc power by:

1. Placing all the circuit breakers in the Off position.
2. Remove the top and bottom DC box input cables, see page 1-40 of the *RS/6000 Enterprise Server S70 Installation and Service Guide* for cable positions.)

**Note:** Disconnect all other AC power cables.

- b. Exchange one of the following FRUs:

1. System rack operator panel card
2. SPCN card
3. System unit operator panel cable
4. System unit SPCN System Rack to Input/Output Rack cable
5. AC box (or DC box, if -48 V dc system)
6. System unit backplane

- c. Reconnect the AC power cables to the power source.

(if **-48 V dc system**, reconnect the top and bottom DC cables to the DC box and set all the circuit breakers to the On position.)

- d. Attempt to power on the system.

- e. If the system powers on, the FRU you exchanged is the failing item.

If the system does not power on, repeat steps 7a through 7e of this procedure and exchange the next FRU in the list.

- f. If the system does not power on after exchanging all the FRUs in the list, ask your next level of support for assistance.

8. Perform the following:

- a. Power off the system.
- b. Attempt to power on the system.

**Does the system power on?**

**Yes**   **No**

↓   Go step 7 of this procedure.

9. Perform the following:

- a. Power off the system.
- b. Display the selected IPL mode on the system unit operator panel.

**Is the selected mode the same mode the customer was using when the power-on failure occurred?**

**No    Yes**

↓    Go step 14 of this procedure.

10. Perform the following:

- a. Power off the system.
- b. Select the mode on the system unit operator panel the customer was using when the power-on failure occurred.
- c. Attempt to power on the system.

**Does the system power on?**

**Yes    No**

↓    Go step 14 of this procedure.

11. Exchange system unit operator panel card (see "System Rack Removal and Replacement Procedures" on page 9-6 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*). Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

12. Perform the following:

- a. Power off the system.
- b. Display the selected IPL mode on the system unit control panel.

Function/Data	Description
01 _ _ _ _ _	Use increment or decrement button and scroll to function 01.
01 _ _ _ A _ _	Press ENTER to enter function 01 Selected IPL Type display. Valid types, which appear in the sixth character position of the Function/Data display, are A, B.

**Is the selected mode the same mode the customer was using when the power-on failure occurred?**

**No    Yes**

↓    Go step 14 of this procedure.

13. Perform the following:

- a. Power off the system.
- b. Select the mode on the system unit operator panel the customer was using when the power-on failure occurred.
- c. Attempt to power on the system.

**Does the system power on?**

**Yes    No**

- ↓ Exchange the system unit operator panel card (see "System Rack Removal and Replacement Procedures" on page 9-6 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*)

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

14. **Is an eight digit error code displayed on the System Rack operator panel?**

**No    Yes**

- ↓ Go to "Entry MAP" on page 11.

15. **Is the Power-On LED (on the operator panel) on continuously?**

**Note:** The Power-On LED blinks during a normal power-on sequence. It should not blink for more than 1 minute.

**No    Yes**

- ↓ Go to step 17 of this procedure.

16. Perform the following:

- a. Disconnect the AC power cable from the customer's power source.  
(if -48 V dc system, disconnect the -48 V dc power by:
  1. Setting all the circuit breakers to the Off position.
  2. Disconnecting the top and bottom DC box input cables, see page 1-40 of the *RS/6000 Enterprise Server S70 Installation and Service Guide* for cable positions.)

- b. Exchange one of the following FRUs:
  - 1. SPCN card
  - 2. AC box (or DC box, if -48 V dc system)
  - 3. System rack operator panel card
- c. Reconnect the AC (or DC, if -48 V dc system) power cable to the power source.
- d. Attempt to power on the system.
- e. If the system powers on, the FRU you exchanged is the failing item.  
If the system does not power on, repeat steps 16a through 16e of this procedure and exchange the next FRU in the list.
- f. If the system does not power on after exchanging all the FRUs in the list, ask your next level of support for assistance.

**This ends the procedure.**

**17. Have all of the racks and units on the system become powered on?**

**Yes    No**

↓    Return to "MAP 1520: Power" on page 23.

**18. Continue the IPL.**

**Does the IPL complete successfully?**

**No    Yes**

↓    **This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

**19. Go to "Entry MAP" on page 11.**

## Cannot Power On Input/Output Rack (No Error Code)

1. Power off the system (see "Powering Off and Powering On the System" on page 9-4 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).
2. Starting from J15 or J16 on the system unit (refer to "System Rack Locations Rear" on page 1-11 of the *RS/6000 Enterprise Server S70 Installation and Service Guide* for location) go to the first Input/Output Rack in the Input/Output Rack interconnect cable sequence on which the PDB Power On light is off (if a -48 V dc system, the first rack in which power will not come on).

3.

**Note:** Read the Danger and Caution notices under "Safety Notices" on page xv of the *RS/6000 Enterprise Server S70 Installation and Service Guide* before continuing with this procedure.

**Is this a -48 V dc powered system?**

**No**   **Yes**

↓   Go to 7 on page 35.

Use a multimeter to measure the AC voltage at the customer's AC power outlet.

**Is the ac voltage from 200 V ac to 240 V ac?**

**Yes**   **No**

↓   Inform the customer that the AC voltage at the power outlet is not correct.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

4. **Is the AC power cable from the Input/Output Rack PDB to the customer's AC power outlet connected and seated correctly at both ends?**

**Yes**   **No**

↓   Connect the AC power cables correctly at both ends.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

5.

**Note:** Read the Danger and Caution notices under "Safety Notices" on page xv of the *RS/6000 Enterprise Server S70 Installation and Service Guide*

Perform the following:

- a. Disconnect the AC power cable from the Input/Output Rack PDB.
- b. Use a multimeter to measure the AC voltage at the Input/Output Rack end of the AC power cable.

**Is the AC voltage from 200 V ac to 240 V ac?**

**Yes   No**

↓ Exchange the mainline ac power cable.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

6. Replace the Power Distribution Bus (PDB).

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

7.

- a. Switch off power to the system and all devices and drawers in the rack. Refer to the service guides for the devices installed in your rack for more information.
- b. Switch off power to all external devices attached to the rack. Refer to the service guide for the external devices attached to your rack for more information.
- c. Set the switches for all circuit breaker panels in to the off position.
- d. Remove the screws attaching the top cover to the power distribution assembly, and remove the top cover.

8. Using a multimeter, measure for -40 to -60 V dc between the -48 V dc input connectors (upper connectors) and the return ground connectors (lower connectors) for both the A and B power sources on each circuit breaker panel. If both 20A/10A and 15A circuit breaker panels are installed, measure the A and B side of each.

**Is the correct voltage present?**

**Yes No**

- ↓
1. Check the customer power source for the correct voltage, and check the external power cables (from customer's power source) are correctly installed and operational.
  2. If the customer's power source verified good, go to step 9 of this procedure.

If the customer's power source is faulty, have the customer fix the faulty power source.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

- 9.
- a. Set all of the circuit breaker switches on the 20A/10A circuit breaker panel to the On position.
  - b. Measure for -40 to -60 V dc between the -48 V dc supply output and positive ground return connections for each of the eight circuit breakers within the 20A/10A circuit breaker panel. Record and note any readings which are out of range.

**Is the voltage between -40 and -60 V dc at each position?**

**Yes No**

- ↓ Go to 11 on page 37.



10.

- a. Set all of the circuit breaker switches in the 20A/10A circuit breaker panel to the Off position.
- b. Set all of the circuit breaker switches in the 15A circuit breaker panel to the On position.
- c. Measure for -40 to -60 V dc between the -48 V dc supply output and positive ground return device connectors for each of the eight circuit breakers within the 15A circuit breaker panel. Record and note any readings which are out of range.

**Is the voltage between -40 and -60 V dc at each position?**

**Yes No**

↓ Go to 15 on page 40

Go to 14 on page 40

11.

- a. Set all circuit breaker switches in **both** circuit breaker panels in your rack to the Off position.
- b. Carefully label the device -48 V dc power cables and the DC return cables with device, polarity, and circuit breaker position information.
- c. Disconnect all of the device and drawer -48 V dc power cables and positive return ground cables from the 20A/10A circuit breaker panel. Tape the ends of the disconnected cables to insulate them and lay them aside.
- d. Set all circuit breakers in the 20A/10A circuit breaker panel to the On position.
- e. Measure for -40 to -60 V dc between the negative and positive device connectors for each of the eight circuit breakers in the 20A/10A circuit breaker panel.

**Is the voltage between -40 and -60 V dc at each position?**

**Yes No**

↓ Replace the 20A/10A circuit breaker panel.

**This ends the procedure.**

Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

12.

- a. Set all circuit breaker switches in **both** circuit breaker panels to the Off position.
- b. Reconnect all device -48 V dc power cables and return cables to the 20A/10A circuit breaker panel **except** for cables to those positions which were out of range in 9 on page 36.

**Note:** Visually check for shorts at the terminal lugs.

- c. Set all circuit breaker switches on the 20A/10A circuit breaker panel to the On position.
- d. Measure for -40 to -60 V dc between the negative and positive device connectors for each of the eight circuit breakers in the 20A/10A circuit breaker panel **including** those positions which were out of range in 9 on page 36.

**Is the voltage between -40 and -60 V dc at each position?**

**Yes No**



An intermittent problem may exist in the power distribution system. Possible causes are:

- 20A/10A circuit breaker panel
- Attached cables

**This ends the procedure.**

13.

- a. Set all circuit breaker switches in the 20A/10A circuit breaker panel to the Off position.
- b. Reconnect the device -48 V dc power cables and return ground cables for those circuit breaker positions which were out of range in 9 on page 36.
- c. Set the circuit breaker panel switches for the positions which were out of range in 9 on page 36 to the On position.
- d. Measure for -40 to -60 V dc between the -48 V dc supply and ground return device connectors *for the circuit breakers in the 20A/10A circuit breaker panel that were out of range.*

**Is the voltage between -40 and -60 V dc at each position?**

**Yes No**

- ↓ The power problem is located in the attached device. Consult the service guide for the failing device for diagnostics.

**This ends the procedure.**

Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

The symptom has changed, there may be an intermittent problem with the circuit breaker panel or an intermittent short at the attached device or cable.

**This ends the procedure.**

Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

14. The circuit breakers are functioning properly. The power problem is probably located in the power supply for the drawer or devices installed in your rack. Refer to the service guide for the drawers or devices installed in your rack.

**This ends the procedure.**

15.

- a. Set all of the circuit breaker panel switches in **both** circuit breaker panels to the Off position.
- b. At the terminal strip, disconnect the cables from the terminal strip to the devices or drawers for every circuit breaker panel position that was out of range in step 10 on page 37. Carefully label each pair, tape the ends to insulate the leads, and set the cables aside.
- c. Set the circuit breaker switches on the 15A circuit breaker panel to the On position.
- d. Measure for -40 to -60 V dc between the -48 V dc supply and ground return device connectors at the circuit breaker panel for the circuit breakers in the 15A circuit breaker panel that were out of range.

**Is the voltage between -40 and -60 V dc at each position?**

**Yes No**

↓ Go to 16

The problem is located in the device or drawer attached to the circuit breaker panel in question. Refer to the service guide for the attached drawer or device for diagnostics.

**This ends the procedure.**

Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

16.

- a. Set all circuit breaker switches in **both** circuit breaker panels to the Off position.
- b. At the terminal strip, disconnect the cables from the terminal strip to the circuit breaker panel for every circuit breaker position that was out of range in step 10 on page 37. Carefully label each pair, tape the ends to insulate the leads, and set the cables aside.
- c. Set the 15A circuit breaker switch associated with these cables to the On position.

- d. Measure for -40 to -60 V dc between the -48 V dc supply and ground return device connectors at the circuit breaker panel for the circuit breakers in the 15A circuit breaker panel that were out of range.

**Is the voltage between -40 and -60 V DC?**

**Yes No**

↓ Go to 18 on page 42 in this procedure.

17.

- a. Set all circuit breaker switches on both circuit breaker panels to the Off position.
- b. Using an ohmmeter, check the terminal strip to see if it is shorted.

**Is the terminal strip shorted?**

**Yes No**

↓ Possible intermittent short was made at the the terminal strip. Replace the cables and verify that the proper voltage is present.

If the proper voltage is not present, consult the service guide for the device or drawer attached to this position.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Replace the terminal strip.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

18.

- a. Set all circuit breaker switches on both circuit breaker panels to the Off position.
- b. At the circuit breaker panel, disconnect both cables (sides A and B) from the connectors for the circuit breakers in question.
- c. Set the circuit breaker switches for the 15A circuit breaker panels in question to the On position.
- d. Measure for -40 to -60 V dc between the -48 V dc supply and positive ground return for the 15A circuit breaker in question.

**Is the voltage between -40 and -60 V dc?**

**No    Yes**



Replace the cables connecting the circuit breaker panel to the terminal strip.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Replace the 15A circuit breaker panel.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

## Input/Output Rack Becomes Powered On, But A Rack Mounted Unit Does Not Become Powered On

If you have a problem powering on a drawer in an Input/Output Rack, examine all the I/O Drawer Indicator Panels to attempt to isolate the problem I/O Drawer. See "I/O Drawer Indicator Panel" on page 1-24 of the *RS/6000 Enterprise Server S70 Installation and Service Guide* for more information.

1. **Are all circuit breakers reset at the Input/Output Rack PDB (If -48 V dc system, are all circuit breakers on the circuit breaker panel reset?)**

**Yes No**

↓ Reset the popped circuit breaker.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

2. **Are all the AC "Y" cables seated firmly and connected from the Input/Output Rack PDB to the I/O Drawer (one end to a PDB outlet, the other two ends of the same AC "Y" cable to the two separate dc power supplies of the same I/O Drawer)? (On -48 V dc systems, check the power cables from the circuit breaker panel on the top of the rack to the I/O Drawers for correct connections. Are all the -48 V dc connections correct and tight?)**

**Yes No**

↓ Fix the connection.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

3.

**Note:** Read the Danger and Caution notices under "Safety Notices" on page xv of the *RS/6000 Enterprise Server S70 Installation and Service Guide* before continuing with this procedure.

Perform the following:

- a. Disconnect the AC "Y" power cable 1/4 and 3/4 power cables from each power supply on each I/O Drawer that fails to power on.

(if -48 V dc system, disconnect the power cables for -48 V dc operation to the 1/4 and 3/4 power supplies.)

**Note:** Set circuit breakers to the Off position while disconnecting the DC power cables. Then set the circuit breakers to the On position.

- b. Use a multimeter to measure the AC (or DC, if -48 V dc system) voltage at the I/O Drawer end of the AC (or DC, if -48 V dc system) power cables.

**Is the ac voltage from 200 V ac to 240 V ac  
(Is the DC voltage from -40 to -60 V dc on -48 V dc systems)?**

**Yes No**

- ↓ Exchange the "Y" AC power cable (or the 1/4 and 3/4 DC power cables, on -48 V dc systems)

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

#### 4. Is a primary I/O Drawer in the I/O rack not powering up?

**Note:** The primary I/O Drawer is the only I/O Drawer with a Service Processor card in Slot 8.

**Yes No**

- ↓ Go to step 9 on page 45

#### 5. Replace the following, one at a time, turning off the power before replacement and attempting to power on after replacement:

- a. Service Processor card
- b. 3/4 power supply
- c. 1/4 power supply
- d. Indicator card
- e. Three fan assembly
- f. I/O Planar.

#### 6. Does the I/O Drawer power up?

**Yes No**

- ↓ Go to step 14 on page 45.

#### 7. Are all I/O Drawers powered up (green LEDs are on both supplies in each I/O Drawer)?

**Yes No**

- ↓ Go to step 18 on page 45.

#### 8. **This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.



**9. Are all SPCN cables from and to the secondary I/O Drawer(s) connected properly and firmly seated?**

**Yes No**

↓ Go to step 23 on page 46.

**10. Is only one secondary I/O Drawer not powering up?**

**Yes No**

↓ Go to step 24 on page 46.

**11. Replace the following:**

a. 3/4 power supply

b. 1/4 power supply

c. Indicator card

d. Three fan assembly

e. I/O Planar.

**12. Does the I/O Drawer power up?**

**Yes No**

↓ Go to step 16.

**13. Go to step 7 on page 44.**

**14. Have you replaced all parts in the list in step 5 on page 44?**

**Yes No**

↓ Go to step 5 on page 44 and try the next part in the list.

**15. Ask your next level of support for assistance.**

**This ends the procedure.**

**16. Have you replaced all parts in the list in step 11?**

**Yes No**

↓ Go to step 11 and try the next part in the list.

**17. Go to step 15.**

**18. Does the I/O Drawer have at least one power supply LED on?**

**Yes No**

↓ Go to step 21 on page 46.

19. Replace the power supply with the LED off.
20. Go to step 7 on page 44.
21. Replace all the SPCN cables connected to the failing I/O Drawer.
22. Go to step 12 on page 45.
23. Connect all the SPCN cables properly.  
**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.
24. **Are all the SPCN cables from the primary I/O Drawer connected properly and firmly seated?**  
  
**Yes    No**  
↓    Go to step 23.
25. Replace the SPCN cables from the primary I/O Drawer.
26. Go to 12 on page 45.

## System Rack, I/O Rack, or Rack Mounted Unit Cannot Become Powered Off

This procedure analyzes a failure of the normal command and operator panel procedures to power off the system or an Input/Output Rack

If you have a problem powering off a drawer in and Input/Output Rack, examine all I/O Drawer indicator panels to attempt to isolate to the problem I/O Drawer. See "I/O Drawer Indicator Panel" on page 1-24 of the *RS/6000 Enterprise Server S70 Installation and Service Guide* for more information.

**Attention:** To prevent loss of data, ask the customer to verify that no interactive jobs are running before you perform this procedure.

### 1. Is the power off problem on the System Rack?

**No**    **Yes**

↓    Go to step 4 of this procedure.

2. Ensure that the SPCN cables that connect the racks are connected and seated correctly at both ends.

**Does the Input/Output Rack power off, and is the power-good LED off, on all the power supplies in all the drawers (the power supply power-good LED can be seen from the rear of the I/O Drawer)?**

**No**    **Yes**

↓    **This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

3. Go to step 5 of this procedure.

4. Refer to "Powering Off and Powering On the System" on page 9-4 of the *RS/6000 Enterprise Server S70 Installation and Service Guide* to power off the system, then return here and answer the following question.

**Does the System Rack power off, and is the Power On light off?**

**No**    **Yes**

↓    The system is not responding to normal power off procedures, which could indicate a Licensed Internal Code problem.

Ask your next level of support for assistance.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

5. Disconnect the AC (or DC, if -48 V dc system) power cables.

6. Exchange the following FRUs in the System Rack or the Input/Output Rack one at a time (see "System Rack Removal and Replacement Procedures" on page 9-6 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*):

If the System Rack is failing:

- a. Operator panel
- b. SPCN card
- c. AC module
- d. Operator panel cable

If an Input/Output Rack is failing:

- a. SPCN System Rack to Input/Output Rack cable
- b. Service Processor card in Input/Output Rack.
- c. I/O planar in primary I/O Drawer.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

## The SRC Table Has Directed You Here and the SRC is 1xxx1200

The power system in the System Rack is failing.

**Attention:** AC (or DC, if -48 V dc system) power cable **must** be disconnected from the System Rack before removing or installing regulators 17 or 18.

**Note:** To remove DC power, first set all circuit breakers on the circuit breaker panels to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).

1. Perform the following:
  - a. Power off the system.
  - b. Remove regulator assemblies R01 to R16, R19, and R20 from the System Rack. Do not remove R17 or R18.
  - c. Power on the system.

**Is SRC 1xxx1200 displayed?**

**Yes No**

↓ Go to step 14 on page 52.

2. Perform the following:
  - a. Power off the system.
  - b. Remove one of the blowers from the System Rack not previously removed during this procedure.
  - c. Power on the system.

**Is SRC 1xxx1200 displayed?**

**Yes No**

↓ The blower you removed in this step is failing, replace the blower.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

3. **Have you removed all the blowers one at a time?**

**No Yes**

↓ Install all blowers and go to step 5 on page 50.

4. Perform the following:
  - a. Power off the system.

- b. Install the blower that was removed in step 2.
- c. Go to step 2 on page 49.

5. Perform the following:

- a. Power off the system.
- b. Remove all except one of the Bulk Power Supplies from the System Rack.
- c. Power on the system.

**Is SRC 1xxx1200 displayed?**

**Yes No**

↓ Go to step 11 on page 52.

6. Perform the following:

- a. Power off the system.
- b. Remove the only Bulk Power Supply installed.
- c. Install one of the other Bulk Power Supplies that was removed in step 5.
- d. Power on the system.

**Is SRC 1xxx1200 displayed?**

**Yes No**

↓ The Bulk Power Supply that was just removed in this step is failing, replace the Bulk Power Supply.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

7. Perform the following:

- a. Power off the system.
- b. Disconnect the AC (or DC, if -48 V dc system) power cables from the System Rack.

**Note:** To remove DC power, first set all circuit breakers on the circuit breaker panels to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).

- c. Remove regulator assembly R17.
- d. Reconnect the AC (or DC, if -48 V dc system) power cable to the System Rack.
- e. Power on the system.

**Is SRC 1xxx1200 displayed?**

**Yes No**

↓ Regulator assembly R17 is failing, replace regulator assembly R17.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

8. Perform the following:

- a. Power off the system.
- b. Remove the AC (or DC, if -48 V dc system) power cable from the System Rack.

**Note:** To remove DC power, first set all circuit breakers on the circuit breaker panels to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).

- c. Remove regulator assembly R18.
- d. Reconnect the AC (or DC, if -48 V dc system) power cable to the System Rack.
- e. Power on the system.

**Is SRC 1xxx1200 displayed?**

**Yes No**

↓ Regulator assembly R18 is failing, replace regulator assembly R18.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

9. Perform the following:

- a. Power off the system.
- b. Exchange the SPCN card.
- c. Power on the system.

**Is SRC 1xxx1200 displayed?**

**Yes No**

↓ The SPCN card that was exchanged in this step is the failing item. Leave the new SPCN in the System Rack.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

10. Replace the system backplane assembly.
11. Perform the following:
  - a. Power off the system.
  - b. Install one of the bulk power supplies that was removed in step 5 on page 50.
  - c. Power on the system.

**Is SRC 1xxx1200 displayed?**

**No**   **Yes**

↓ The bulk power supply you installed in this step is failing, replace the bulk power supply.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

12. Have you installed all the bulk power supplies that were removed in step 5 on page 50.

**Yes**   **No**

↓ Repeat step 11.

13. Install all units removed in this procedure.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

14. Perform the following:
  - a. Power off the system.
  - b. Install one of the regulator assemblies that was removed in step 1 on page 49.
  - c. Remove all the bus load (processor and memory cards, do not remove the clock card).
  - d. Power on the system.

**Is SRC 1xxx1200 displayed?**

**No**   **Yes**

↓ The regulator assembly you just installed is failing, replace the regulator assembly.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.



15. **Have you installed all the regulators that were removed in step 1 on page 49?**

**Yes No**

↓ Go to step 14 on page 52.

**This ends the procedure.**

## The SRC Table Has Directed You Here and the SRC is 1xxx120y or 1xxx140y

A power regulator card in the System Rack is failing.

1. Perform the following:

**Attention:** AC (or DC, if -48 V dc system) power cable **must** be disconnected from the System Rack before removing or installing regulator assemblies R17 or R18.

**Note:** To remove DC power, first set all circuit breakers on the circuit breaker panels to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).

### Is SRC 1xxx140x displayed?

**No**   **Yes**

↓   Go to step 27 on page 59.

2. Is SRC 1xxx1201 displayed?

**No**   **Yes**

↓   Go to step 7 on page 55.

3. Perform the following:

- a. Power off the system.
- b. Remove the load cards (memory cards M08, M09, and M20).
- c. Power on the system.

### Does the system power on?

**Yes**   **No**

↓   Go to step 27 on page 59.

4. Perform the following:

- a. Power off the system.
- b. Install one of the Mxx load cards that was removed in step 3 on page 54.
- c. Power on the system.

**Does the system power on?**

**Yes No**

- ↓ The last card that was installed in step 4 of this procedure is failing, replace the failing card.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

5. **Have all the Mxx load cards been installed?**

**Yes No**

- ↓ Repeat step 4.

6. **This ends the procedure.**

7. **Is SRC 1xxx1202 displayed?**

**Yes No**

- ↓ Go to step 12 on page 56.

8. Perform the following:

- a. Power off the system.
- b. Remove the load cards M07 and M20.
- c. Power on the system.

**Does the system power on?**

**Yes No**

- ↓ Go to step 27 on page 59.

9. Perform the following:

- a. Power off the system.
- b. Install one of the Mxx load cards that was removed in step 8 on page 55.
- c. Power on the system.

**Does the system power on?**

**Yes No**

↓ The last card that was installed in step 9 is failing, replace the failing card.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

10. **Have all the Mxx load cards been installed?**

**Yes No**

↓ Repeat step 9.

11. **This ends the procedure.**

12. **Is the SRC 1xxx1203?**

**Yes No**

↓ Go to step 15 on page 57.

13. Perform steps 27 on page 59 through 29 on page 60 and then return here.

**Did performing steps 27 on page 59 through 29 on page 60 resolve SRC 1xxx1203?**

**No Yes**

↓ **This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

14. Replace the system backplane assembly.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

15. Is the SRC 1xxx1204?

**Yes No**

↓ Go to step 17.

16. Perform steps 27 on page 59 through 29 on page 60 and then return here.

**Did performing steps 27 on page 59 through 29 on page 60 resolve SRC 1xxx1204?**

**No Yes**

↓ **This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

17. Is the SRC 1xxx1205?

**Yes No**

↓ Go to step 22 on page 58.

18. Perform the following:

- a. Power off the system.
- b. Remove cards M10 and M15.
- c. Power on the system.

**Does the system power on?**

**Yes No**

↓ Go to step 27 on page 59.

19. Perform the following:

- a. Power off the system.
- b. Install one of the Mxx load cards that was removed in step 18.
- c. Power on the system.

**Does the system power on?**

**Yes No**

↓ The last card that was installed in step 19 is failing, replace the failing card.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

20. **Have all the Mxx load cards been installed?**

**Yes No**

↓ Repeat step 19 on page 57.

21. **This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

22. **Is the SRC 1xxx1206?**

**Yes No**

↓ Go to "Entry MAP" on page 11.

23. Perform the following:

- a. Power off the system.
- b. Remove cards M1 through M6.
- c. Power on the system.

**Does the system power on?**

**Yes No**

↓ Go to step 27 on page 59.

24. Perform the following:

- a. Power off the system.
- b. Install one of the Mxx load cards that was removed in step 23.
- c. Power on the system.

**Does the system power on?**

**Yes No**

↓ The last card that was installed in 24 is failing, replace the failing card.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

25. **Have all the Mxx load cards been installed?**

**Yes No**

↓ Repeat step 24

26. **This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

27. Perform the following:

- a. Power off the system.
- b. Using the reference code see the table at the end of this procedure to identify the possible failing regulators.
- c. Remove one of the possible failing regulators and install a new regulator card.
- d. Power on the system.

**Does the system power on?**

**No    Yes**

↓    The regulator assembly you removed in this step is the failing, replace the regulator assembly.

**This ends the procedure.**

28. **Have you swapped all the regulator card assemblies?**

**No    Yes**

↓    **This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

29. Perform the following:

- a. Power off the system.
- b. Remove the new regulator assembly and install the original regulator assembly.
- c. Go to step 27 on page 59 to test another regulator assembly.

<b>Reference Code</b>	<b>The Possible Failing Regulators are:</b>
1201, 1401	R1 - R7, R9, R10, R12, R15, R16 Programmable Regulator Assembly
1202, 1402	R3 - R7, R9, R10, R12, R15, R16 Programmable Regulator Assembly
1203, 1204, 1403, 1404	R17, R18 Memory Regulator Assembly
1205, 1206, 1405, 1406	R9 - R12 Programmable Regulator Assembly



## Regulator Problem Isolation

**Note:** Read the Danger and Caution notices under “Safety Notices” on page xv of the *RS/6000 Enterprise Server S70 Installation and Service Guide* before continuing with this procedure.

**Attention:** AC (or DC, if -48 V dc system) power cable **must** be disconnected from the System Rack before removing or installing regulators 17 or 18.

**Note:** To remove DC power, first set all circuit breakers on the circuit breaker panels to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).

1. Power off the system.
2. Perform the following:

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

Disconnect all cards in the System Rack except the SPCN card, regulator assemblies, and the clock card.

**Note:** Disconnect the cards by pulling them out about one inch.

3. Power on the system.

**Does a regulator SRC occur?**

**Yes No**

↓ Go to step 8 on page 62.

4. Perform the following:

- a. Power off the system.
- b. If the SRC identifies the failing regulator, start with that regulator.
- c. Remove one of the regulators and install a new regulator.
- d. Power on the system.

**Does a regulator SRC occur?**

**Yes No**

↓ The regulator assembly that was removed in this step is failing, replace the regulator assembly.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

5. Perform the following:

- a. Power off the system.
- b. Remove the new regulator assembly that you just installed and install the original regulator assembly.
- c. Remove a different regulator (not previously removed) and install a new regulator.
- d. Power on the system.

**Does a regulator SRC occur?**

**Yes**   **No**

- ↓   The regulator assembly that was removed in this step is failing, replace the regulator assembly.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

6. Repeat step 5 on page 61 until a new regulator assembly has been installed in all possible positions. Then continue with the next step.
7. Exchange the following FRUs, one at a time, until the problem is corrected:
  - a. SPCN card
  - b. System backplane assembly.

If the system has the same SRC after exchanging all the FRUs in this procedure, ask you next level of support for assistance.

**This ends the procedure.**

**8. Do you have an SRC other than a regulator SRC?**

**No**   **Yes**

- ↓   A different SRC or reference code occurred. Use the new SRC or reference code and go to "Entry MAP" on page 11.

9. Perform the following:

- a. Power off the system.
- b. Install one of the cards you removed in 2 on page 61.
- c. Power on the system.

**Does a regulator SRC occur?**

**No    Yes**



Power off the system.

Exchange the last card installed.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

10. Repeat step 9 until all of the cards have been installed.

If a regulator SRC exists after completing this procedure, ask your next level of support for assistance.

**This ends the procedure.**

## Power Good Problem Isolation

**Attention:** AC (or DC, if -48 V dc system) power cable **must** be disconnected from the System Rack before removing or installing regulators 17 or 18.

**Note:** To remove DC power, first set all circuit breakers on the circuit breaker panels to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).

1. Perform the following:
  - a. Power off the system.
  - b. Exchange the SPCN card.
  - c. Power on the system.

**Does SRC 1xxx640x continued to be displayed?**

**Yes No**

↓ The SPCN card that was removed is failing, replace the SPCN card.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

2. Perform the following:
  - a. Power off the system.
  - b. Remove one of the regulators in position R11, R16, R17, or R20 and install a new regulator assembly.

**Note:** The regulator in position R17 is not the same part number as the other three regulators.
  - c. Power on the system.

**Is SRC 1xxx640x displayed?**

**Yes No**

↓ The regulator assembly that was removed in this step is failing, replace the failing regulator assembly.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

3. Perform the following:
  - a. Power off the system.
  - b. Remove the new regulator that was installed in step 2 and replace it with the original regulator.

c. Remove one of the untested regulators from position R11, R16, R17, or R20 and install a new regulator assembly.

d. Power on the system.

**Is SRC 1xxx640x displayed?**

**Yes No**

↓ The regulator assembly that was removed in this step is failing, replace the failing regulator assembly.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

4. Repeat step 3 on page 64 until a new regulator has been installed in positions R11, R16, R17, and R20. Then continue with the next step.

5. Remove the processor cards from the System Rack.

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

6. Power on the system.

**Is SRC 1xxx640x displayed?**

**No Yes**

↓ Exchange the system backplane assembly in the System Rack.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

7. Perform the following:

- a. Power off the system.
- b. Install one of the cards you removed in 5 on page 65.
- c. Power on the system.

**Is SRC 1xxx640x displayed?**

**No    Yes**

↓ Power off the system.

Replace the last card installed.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

8. Repeat step 7 until all cards have been reinstalled.

**This ends the procedure.**

## AC Box (or DC Box, If -48 V dc System) Problem Isolation

A bulk power supply with a blinking or unlit light (LED) is an indication of a failure.

**Note:** Read the Danger and Caution notices under “Safety Notices” on page xv of the *RS/6000 Enterprise Server S70 Installation and Service Guide* before continuing with this procedure.

**Attention:** AC (or DC, if -48 V dc system) power **must** be disconnected from the System Rack before removing or installing regulator assemblies 17 or 18.

**Note:** To remove DC power, first set all circuit breakers on the circuit breaker panels to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).

1. Perform the following:
  - a. Power off the system.
  - b. Disconnect all regulators assemblies by sliding them partially out of the enclosure.
  - c. Power on the system.

**Does a power supply reference code occur?**

**Yes No**

↓ Go to step 12 on page 69 of this procedure.

2. Perform the following:
  - a. Power off the system.
  - b. Remove one of the blowers from the System Rack that was not previously removed during this procedure.
  - c. Power on the system.

**Does a power supply reference code occur?**

**Yes No**

↓ The blower you removed in this step is failing, replace the failing blower.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

3. **Have you removed all the blowers one at a time?**

**No Yes**

↓ Install all the blowers and continue with step 5 on page 68.

4. Perform the following:
  - a. Power off the system.
  - b. Install the blower that was removed in step 2 on page 67. in the original location.
  - c. Go to step 2 on page 67

5. Perform the following:
  - a. Power off the system.
  - b. Remove all except one of the bulk power supplies from the system.
  - c. Power on the system.

**Does a power supply reference code occur?**

**Yes No**

↓ Go to step 9 on page 69.

6. Perform the following:
  - a. Power off the system.
  - b. Remove the bulk power supply that is installed.
  - c. Install one of the other bulk power supplies that was removed in step 5.
  - d. Power on the system.

**Does a power supply reference code occur?**

**Yes No**

↓ The bulk power supply you just removed in step 6 is failing, replace the bulk power supply.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

7. Perform the following:
  - a. Power off the system.
  - b. Exchange the SPCN card.
  - c. Power on the system.

**Does a power supply reference code occur?**

**Yes No**



↓ The SPCN card you exchanged is failing, replace the SPCN card.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

8. Exchange the system backplane assembly.

**This ends the procedure.**

9. Perform the following:

- a. Power off the system.
- b. Install one of the bulk power supplies that was removed in step 5 on page 68 of this procedure.
- c. Power on the system.

**Does a power supply reference code occur?**

**No    Yes**

↓ The bulk power supply you installed in this step is failing, replace the bulk power supply.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

10. Have you installed all of the bulk power supplies that were removed in step 5 on page 68.

**Yes    No**

↓ Go to step 9.

11. The problem is no longer present. You may have an intermittent problem.

**This ends the procedure.**

12. Perform the following:

- a. Power off the system.
- b. Install one of the regulator assemblies that were removed in step 1 on page 67.
- c. Remove all bus load (processor and memory cards) except the clock card and SPCN card.
- d. Power on the system.

**Does a power supply reference code occur?**

**No    Yes**

↓ The regulator assembly you just installed is failing, replace the regulator assembly.

**This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

13. Have you installed all the regulator assemblies that were removed in step 1 on page 67.

**Yes No**

↓ Go to step 12 on page 69.

14. **This ends the procedure.**

---

## MAP 1540: Minimum Configuration

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

### Notes:

1. Be sure to unplug the power cable from the System Rack and Input/Output Rack before removing or installing Service Processor, CPU cards, Memory Cards, or I/O planar to avoid damage.

**Note:** To remove the DC power cables and DC power from the -48 V dc system, first set all circuit breakers on both the System Rack and Input/Output Rack to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).

Remove all DC supply cables from the circuit breakers to the configured drawers in the rack.

2. This MAP assumes that a CD-ROM drive is installed and connected to a SCSI adapter in slot 2, and a Diagnostics CD-ROM is available.
3. If a general access password or privileged-access password is installed, you are prompted to enter the password before the diagnostic CD-ROM can load.
4. The term "POST indicators" refer to the icons (graphic display) or device mnemonics (ASCII terminal) that appear during the power-on self-test (POST).
5. The Service Processor may have recorded one or more symptoms in its error log. It is a good idea to examine that error log before proceeding (see Service Processor System Information Menu).
6. The Service Processor may have been set by the user to monitor server operations and to attempt recoveries. You may wish to disable these actions while you diagnose and service the system. If you disable them, you should make notes of their current settings for restoration before you leave. Following are the settings of your interest.

Surveillance	From the Service Processor Setup Menu, go to the Surveillance Setup Menu and disable surveillance.
Unattended Start	From the Service Processor System Power Control Menu disable unattended start mode.

Reboot Policy	From the System Power Control Menu go to the Reboot/Restart Policy Setup Menu and set: <ol style="list-style-type: none"><li>1. Number of reboot attempts to <b>0</b> (zero)</li><li>2. Use OS-Defined restart policy to <b>No</b></li><li>3. Enable supplemental restart policy to <b>No</b>.</li></ol>
Call Out	From the Call-In/Call-Out Setup Menu, go to the Serial Port Selection Menu and disable call-out on both serial ports.

---

### Step 1540-1

1. Ensure that the diagnostics and the operating system are shut down.
2. Insert the diagnostic CD-ROM into the CD-ROM drive.
3. Turn the power off.
4. Turn the power on.
5. When the keyboard indicator is displayed (the word **keyboard** on an ASCII terminal or the keyboard icon on a graphical display), press the F5 key on the directly-attached keyboard or the number 5 key on an ASCII terminal.
6. Enter the appropriate password when prompted to do so.

### Is the “Please define the System Console” screen displayed?

- NO** Go to “Step 1540-2.”  
**YES** Go to “Step 1540-3” on page 74.

---

### Step 1540-2

The system is unable to boot standalone diagnostics.

The boot attempts that follow will attempt to get the “Please define system console” prompt on the system console. Ignore any codes that may appear on the operator panel unless stated otherwise.

Go to “Step 1540-4” on page 74.

---

### Step 1540-3

The system stopped with the “Please define system console” prompt appearing on the system console.

Standalone diagnostics can be booted.

- | 1. Follow the instructions on the screen to select the system console.
- | 2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
- | 3. If the terminal type has not been defined, you must use the Initial Terminal option of the FUNCTION SELECTION menu to initialize the AIX operating system environment before you can continue with the diagnostics. This is a separate and different operation than selecting the console display.
- | 4. Select Advanced Diagnostic Routines.
- | 5. When the DIAGNOSTIC MODE SELECTION menu displays, select System Verification.
- | 6. Record any devices missing from the list of all adapters and devices.

| The boot attempts that follow will attempt to isolate any remaining I/O Drawer problems with missing devices. Ignore any codes that may appear on the operator panel unless stated otherwise. A successful Boot is one where the system displays “Please Define the System Console” prompt and displays all configured and connected devices in the System Verification Menu.

| Go to “Step 1540-4.”

---

### Step 1540-4

Look at the rear of the System Rack and locate the JTAG cable in the top left corner.

Follow the other end of the JTAG cable back to the Service Processor card located in the primary I/O Drawer in the primary I/O rack.

**Are there any secondary I/O Drawers attached to the System Rack?**

**NO** Go to “Step 1540-20” on page 88.

**YES** Go to “Step 1540-5” on page 75.

---

### Step 1540-5

There is at least one secondary I/O Drawer attached to the System Rack. Isolate the primary I/O drawer by performing the following steps:

**Note:** Before continuing, check the cabling from the System Rack to I/O Drawer(s) to ensure that the system is cabled correctly. Refer to “Cabling the System Rack and Input/Output Rack” on page 1-26 of the *RS/6000 Enterprise Server S70 Installation and Service Guide* for valid configurations. Record the current cabling configuration and then continue below.

1. Turn the system power off.
2. Verify that primary I/O drawer RIO port 0 is connected to system rack RIO port 0.
3. Connect primary I/O drawer RIO port 1 to system rack RIO port 1.
4. Verify that the primary I/O drawer SPCN port 1 is connected to system rack SPCN port 0.
5. Connect primary I/O drawer SPCN port 2 to system rack SPCN port 1.

**Note:** The primary I/O Drawer should be cabled as shown in “Cabling the System Rack and Input/Output Rack” on page 1-26 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*, for “System Rack Attached to one I/O Drawer” Be sure to look at both RIO cables and SPCN cables.

6. Disconnect AC (or DC, if -48 V dc system) power from remaining I/O Drawer(s) and Input/Output Rack(s).
7. All I/O drawers except the primary I/O Drawer should now be physically disconnected from the System Rack.

Go to “Step 1540-6” on page 76.

---

**Step 1540-6**

The primary I/O Drawer is the only remaining I/O Drawer connected to the System Rack.

Turn the power on.

If the boot is not successful, the problem is in primary I/O drawer.

**Was the boot successful?**

- NO** Go to “Step 1540-7” on page 77.
- YES** Go to “Step 1540-12” on page 82.



---

## Step 1540-7

Perform the following to deconfigure the primary I/O drawer:

1. Turn off the power.
2. If you have not already done so, reset the Service Processor settings with the instructions in 6 on page 71, then return here and continue.
3. Exit the Service Processor menus and remove the AC (or DC, if -48 V dc system) power cables from the System Rack and the Input/Output Rack.  
**Note:** To remove the DC power cables and DC power from the -48 V dc system, first set all circuit breakers on both the System Rack and Input/Output Rack to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).  
Remove all dc supply cables from the circuit breakers to the configured drawers in the rack.
4. If a display adapter with keyboard and mouse connected to the primary I/O drawer is being used as the console, locate a standalone serial terminal (possibly a 3151) and connect to the S1 serial port.
5. Remove the keyboard and mouse, if attached to the primary I/O drawer.
6. Leave the remaining external cables (RIO-port0, RIO-port1, SPCN-port0, SPCN-port1, JTAG-SP, and OPPanel) connected.
7. Disconnect the cables attached to adapters in the drawer.  
**Note:** Label and record the location of any cables attached to the adapters.
8. Remove all of the adapters except the Service Processor in slot 8 and the SCSI adapter that is attached to the boot device.  
**Note:** Record the slot numbers of the PCI adapters.
9. Disconnect the diskette drive cable from the diskette drive connector on the Service Processor card.
10. Plug in the AC power cables for the System Rack and the Input/Output Rack. (If -48 V dc system, plug in all disconnected cables from step 3, set the circuit breakers to On.) The operator panel should now display a blank yellow back-lighted LED panel.
11. Turn on the power.

12. When TTY screen displays Enter 0 to select this console press the 0 key on the TTY terminal's keyboard.

**Was the boot successful?**

**NO** Go to "Step 1540-10" on page 80.

**YES** Go to "Step 1540-8" on page 79.

---

### Step 1540-8

If the boot was successful, the problem is with one of the adapter cards or devices that was removed or disconnected from the primary I/O Drawer.

1. Turn the power off.
2. Replace one adapter or device that was removed. Use the original adapter cards in their original slots when reinstalling adapters.
3. Turn the power on.

#### Was the boot successful?

**NO** Go to "Step 1540-9."

**YES** Reinstall the next adapter or device and return to the beginning of this step. Continue repeating this process until an adapter or device causes the boot to be unsuccessful.

---

### Step 1540-9

The adapter or device you just installed is causing the boot to be unsuccessful. Replace the adapter or device that is causing the boot to be unsuccessful with a new adapter.

Reinstall all remaining adapters and reconnect all devices. Return the system to its original configuration. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

---

## Step 1540-10

If boot is unsuccessful, turn off the power, disconnect the AC power cable (or DC power cables, if -48 V dc system), and replace the remaining parts listed below one at a time. Reconnect the AC power cable (or DC power cables, if -48 V dc system and set the circuit breakers to the On position) turn power on, and check for a successful boot.

**Note:** To remove the DC power cables and DC power from the -48 V dc system, first set all circuit breakers on both the System Rack and Input/Output Rack to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).

Remove all dc supply cables from the circuit breakers to the configured drawers in the rack.

1. Boot device SCSI card
2. Boot device SCSI cable
3. Service Processor card
4. I/O planar
5. I/O Drawer 3/4 power supply
6. I/O Drawer 1/4 power supply
7. Indicator card
8. Three fan assembly

### Was the boot successful?

**NO** Reinstall the next part in the list and return to the beginning of this step. Continue repeating this process until a part causes the boot to be successful.

If you have replaced all the items listed above and the boot is not successful, check any external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

**YES** Go to "Step 1540-11" on page 81

---

### **Step 1540-11**

If the boot is successful:

1. Turn the power off.
2. The item just replaced fixed the problem.
3. If a display adapter with keyboard and mouse were used reinstall the display adapter card, keyboard and mouse.
4. Reconnect the diskette drive cable to the service processor card.
5. Plug in all adapters that were previously removed but not reinstalled.
6. Reconnect the I/O drawer AC (or DC, if -48 V dc system) power cables that were previously disconnected.

**Note:** Ensure the Input/Output Rack circuit breakers are set to the On position.

Reconfigure the system to its original condition. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

---

## Step 1540-12

If boot is successful, the problem is with a remaining secondary I/O drawer.

### Is the primary I/O Drawer the only drawer connected at this time?

**NO** Go to “Step 1540-13” on page 83.

**YES** Reconnect the second I/O Drawer in the configuration that you recorded earlier in this MAP.

**Note:** The I/O Drawers should be cabled as shown in “Cabling the System Rack and Input/output Rack” on page 1-26 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*, under “System Rack Attached to two I/O Drawers.” Be sure to look at both RIO cables and SPCN cables.

1. Connect AC (or DC, if -48 V dc system) power to this secondary drawer.
2. All I/O drawers except the primary I/O drawer and one secondary I/O drawer should now be physically disconnected from the system rack.

Go to “Step 1540-14” on page 83.

---

### Step 1540-13

The last I/O Drawer reconnected was a secondary I/O Drawer. Reconnect the next I/O Drawer in the configuration you recorded earlier in this MAP.

**Note:** The I/O Drawers should be cabled as shown in “Cabling the System Rack and Input/output Rack” on page 1-26 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*. Be sure to look at both RIO cables and SPCN cables.

Go to “Step 1540-14.”

---

### Step 1540-14

Turn on the power.

#### Is the boot successful?

**NO** Go to “Step 1540-15” on page 84.

**YES** **Is there another I/O Drawer to connect?**

**NO** The problem has changed, call your next level of support.

**YES** Go to “Step 1540-13”

---

## Step 1540-15

The boot is not successful, the problem is in last secondary I/O Drawer that was connected. Do the following steps to deconfigure this secondary I/O Drawer.

1. Turn off the power.
2. Unplug the AC (or DC, if -48 V dc system) power cables for the System Rack and Input/Output Rack.

**Note:** To remove DC power in the System Rack set all circuit breakers to the Off position. Then, remove the DC input cables to the DC Box, both the top and bottom connectors. To remove DC power in the Input/Output Rack, set all circuit breakers to the Off position and disconnect the DC input cables from the 3/4 and 1/4 power supplies.

3. Leave the external cables (RIO-port0, RIO-port1, SPCN-port0, SPCN-port1) connected.
4. Record the slot numbers of the PCI adapters.
5. Label and record the location of any cables attached to the adapters.
6. Remove all of the adapters.
7. Plug in the AC (or DC, if -48 V dc system) power cables for the System Rack and the Input/Output Rack.

**Note:** If -48 V dc system, reconnect the cables that were disconnected in step 2 and set the circuit breakers to the On position.

The operator panel should now display a blank yellow backlighted LED panel.

8. Turn on the power.
9. Go to "Step 1540-16" on page 85.



---

## Step 1540-16

### Is the boot successful?

**NO** Go to “Step 1540-18” on page 87.

**YES** If the boot was successful, the problem is with one of the adapter cards or devices that was removed or disconnected from the I/O Drawer.

1. Turn the power off.
2. Replace one adapter or device that was removed. Use the original adapter cards in their original slots when reinstalling adapters.
3. Turn the power on.

### Was the boot successful?

**NO** Go to “Step 1540-17” on page 86.

**YES** Reinstall the next adapter or device and return to number 1 in this step. Continue repeating this process until an adapter or device causes the boot to be unsuccessful.

---

**Step 1540-17**

Replace the adapter or device that is causing the boot to be unsuccessful with a new adapter.

Reinstall all remaining adapters and reconnect all devices. Return the system to its original configuration. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

---

### **Step 1540-18**

If boot is unsuccessful, turn off the power and replace the remaining parts (listed below) in this drawer, one at a time. Turn power on and check for a successful boot.

1. I/O planar
2. I/O Drawer 3/4 power supply
3. I/O Drawer 1/4 power supply
4. Indicator card
5. Three fan assembly

#### **Was the boot successful?**

**NO** Reinstall the next part in the list and return to the beginning of this step. Continue repeating this process until a part causes the boot to be successful.

If you have replaced all the items listed above and the boot is not successful, check any external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

**YES** Go to "Step 1540-19" on page 88.

---

### **Step 1540-19**

If the boot is successful:

1. Turn the power off.
2. The item just replaced fixed the problem.
3. Plug in all adapters that were previously removed but not reinstalled.
4. Reconnect the I/O drawer AC (or AC, if -48 V dc system) cables that were previously disconnected. Ensure the circuit breakers are set to the On position.

Reconfigure the system to its original condition. Go to “Map 0410: Repair Checkout” in the *Diagnostic Information for Multiple Bus Systems*.

---

### **Step 1540-20**

| The primary I/O Drawer is the only I/O Drawer that was connected to the system  
| rack.

| Go to “Step 1540-7” on page 77.

---

## Update 4

This section contains updates made to the *S70 Installation and Service Guide*, "Chapter 6, Error Code to FRU Index."

Service processor error codes were updated as shown in the following tables.

<i>Table 2. Service Processor Error Codes.</i>		
<b>Error Code</b>	<b>Description</b>	<b>Action/ Possible Failing FRU</b>
4B00F010	Service Processor logged a fault	Review Error Logs, beginning with SP, then AIX.

---

## Unit Reference Code Updates

The Unit Reference Codes have been updated as shown in the following tables.

### (1xxx) System Power Control Network (SPCN) Reference Codes

1. Look at the 4 rightmost characters of the SRC (Data display for function 11-3). 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
6718	For SRC 1011, Regulator 1 has reported a fault. Fault tolerance may allow continued system operation.	<ol style="list-style-type: none"> <li>1. Programmable Regulator Assm., R01 Location: U1.1-P2-V1</li> <li>2. Go to "MAP 1520: Power" on page 23.</li> <li>3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1</li> </ol>
	For SRC 10X1, the 3/4 power supply in a drawer that does not contain the Service Processor Card reported a fault. The system remains powered on. Refer to the note at the end of this table to isolate which drawer.	<ol style="list-style-type: none"> <li>1. 3/4 Power Supply</li> <li>2. I/O Planar</li> <li>3. Indicator Card</li> <li>4. Planar to Indicator Card Cable</li> </ol>

1xxx

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6738	For SRC 1011, Regulator 2 has reported a fault. Fault tolerance may allow continued system operation.	<ol style="list-style-type: none"> <li>1. Programmable Regulator Assm., R02 Location: U1.1-P2-V2</li> <li>2. Go to "MAP 1520: Power" on page 23.</li> <li>3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1</li> </ol>
	For SRC 10XC, the 1/4 power supply in the drawer that contains the Service Processor Card reported a fault. The system remains powered on. Visible as function 05 on the operator panel display.	<ol style="list-style-type: none"> <li>1. 1/4 Power Supply</li> <li>2. Indicator Card</li> <li>3. Planar to Indicator Card Cable</li> <li>4. I/O Planar</li> </ol>
	For SRC 10X1, the 1/4 power supply in a drawer that does not contain the Service Processor Card reported a fault. The system remains powered on. Visible as function 05 on the operator panel display. Refer to the note at the end of this table to isolate which drawer.	<ol style="list-style-type: none"> <li>1. 1/4 Power Supply</li> <li>2. Indicator Card</li> <li>3. Planar to Indicator Card Cable</li> <li>4. I/O Planar</li> </ol>
6A18	For SRC 1011, a regulator fault detection failure occurred for regulator 1.	<ol style="list-style-type: none"> <li>1. Programmable Regulator Assm., R01 Location: U1.1-P2-V1</li> <li>2. Go to "MAP 1520: Power" on page 23.</li> <li>3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1</li> </ol>
	For SRC 10X1, the 3/4 power supply in a drawer that does not contain the service processor card has a sensor fault. The dc-good signal is in the wrong state before power is applied. The system remains powered up. Visible as function 05 on the operator panel display. Refer to the note at the end of this table to isolate which drawer.	<ol style="list-style-type: none"> <li>1. 3/4 Power Supply</li> <li>2. Indicator Card</li> <li>3. Planar to Indicator Card Cable</li> <li>4. I/O Planar</li> </ol>



Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6A38	For SRC 1011, A regulator fault detection failure occurred for regulator 2.	<ol style="list-style-type: none"> <li>1. Programmable Regulator Assm., R02 Location: U1.1-P2-V2</li> <li>2. Go to "MAP 1520: Power" on page 23.</li> <li>3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1</li> </ol>
	For SRC 10XC, the 1/4 power supply in the drawer that contains the Service Processor Card reported a sensor fault. The dc-good signal is in the wrong state before power is applied. The system remains powered on. Visible as function 05 on the operator panel display.	<ol style="list-style-type: none"> <li>1. 1/4 Power Supply</li> <li>2. Indicator Card</li> <li>3. Planar to Indicator Card Cable</li> <li>4. I/O Planar</li> </ol>
	For SRC 10X1, the 1/4 power supply in a drawer that does not contain the Service Processor Card reported a sensor fault. The dc-good signal is in the wrong state before power is applied. The system remains powered up. Visible as function 05 on the operator panel display. Refer to the note at the end of this table to isolate which drawer.	<ol style="list-style-type: none"> <li>1. 1/4 Power Supply</li> <li>2. Indicator Card</li> <li>3. Planar to Indicator Card Cable</li> <li>4. I/O Planar</li> </ol>

## A1xx, B1xx

### (A1xx, B1xx) Service Processor Reference Codes

1. Look at the 4 rightmost characters of the SRC (Data display for function 11-3).  
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
4502	Service Processor	<ol style="list-style-type: none"><li>1. Service Processor Card Location: U0.1-P1-X1</li><li>2. RIO Cable</li><li>3. Operator Panel Assm.</li></ol>

**(B4xx) System Processor Reference Codes**

1. Look at the 4 rightmost characters of the SRC (Data display for function 11-3). Also, you may have additional secondary reference codes in functions 14 and 15.

**Note:** Function 11 provides the primary SRC. Function 12 is an informational status message only and not used. Functions 13 through 19 provide secondary reference codes in addition to the primary SRC. Function 13 provides status information for service support use.

Press Enter to view the SRC. If no SRC is present, press Enter to continue to the next function.

SRC information should be recorded for error reporting. For example, the system processor detected a failure.

- a. Look at the four rightmost characters of the operator panel display for function 11. These four characters are the unit reference code.
- b. Look at functions 14 and 15 for more reference codes. Each is four characters in length. There may be from zero to four unit reference codes contained in these words. For example:

Word 11 - B455 rrrr  
 Word 14 - rrrr rrrr  
 Word 15 - rrrr 0000

This example shows a total of four reference codes for this failure. The rrrr signifies the reference codes. Each reference code has only one FRU associated with it. 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
4440	I/O adapter failed Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

**B4xx**

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4441	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4442	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4443	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4444	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

**B4xx**

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4445	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4446	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4450	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4451	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4452	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4453	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4454	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4455	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4456	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4457	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4458	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4459	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
445A	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
445B	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4460	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4461	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.



Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4462	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4463	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4464	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4465	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4466	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4467	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4468	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4469	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
446A	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
446B	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
4470	JTAG cable or system backplane assembly <b>Note:</b> Verify with your second level of support that function 13 indicates a system backplane assembly failure before replacing the system backplane assembly.	
4470	JTAG cable or system backplane assembly <b>Note:</b> Verify with your second level of support that function 13 indicates a system backplane assembly failure before replacing the system backplane assembly.	JTAG Cable 3M JTAG Cable (Internal) System Backplane Assembly Location Code: U1.1-P1 AIX Location: 00-00
4491	Address out of Range Error. Possible causes could be hardware, operating system, or application programs. With the assistance of your second level of support, check the value of function 13. If function 13 does not show that the problem was caused by hardware, check with AIX support for pertinent AIX program temporary fixes (PTFs).	Possible CPU Pipeline error (Software PTF to fix) Service Processor Firmware Location Code: U0.1-P1-X1

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6440	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6441	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6442	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6443	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6444	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6445	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6446	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6450	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6451	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6452	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6453	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6454	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6455	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6456	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6457	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6458	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6459	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
645A	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
645B	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6460	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.



Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6461	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6462	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6463	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6464	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

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Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6465	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6466	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6467	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6468	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6469	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
646A	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
646B	I/O adapter failed. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6570	I/O adapter hardware error detected. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

## B4xx

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6571	I/O adapter hardware error detected. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6572	I/O adapter hardware error detected. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.
6573	I/O adapter hardware error detected. Use the Service Processor menus described in 5 on page 171 to view the "Progress Indicators from Last Boot" panel. If an E5xy checkpoint is recorded as the first or second entry, the drawer and slot at the time of failure can be determined from the E5xy Checkpoint information found on page 5-15 of the <i>RS/6000 Enterprise Server S70 Installation and Service Guide</i> . Use this information when proceeding to "MAP 1540: Minimum Configuration" on page 71.	Go to "MAP 1540: Minimum Configuration" on page 71.

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## Update 5

This section contains updates made to the *S70 Installation and Service Guide*, "Chapter 9. Removal and Replacement Procedures."

## Electronic Cards

### Removal

**Attention:** All cards are sensitive to electrostatic discharge (see “Handling Static Devices” on page 9-3 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).

1. Power off the system (see “Powering Off and Powering On the System” on page 9-4 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).
2. Disconnect the power cord.
3. Remove the front or rear cover to access the card you are replacing (see “Covers” on page 9-7 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).
4. Are you replacing a card in the front of the system?

**No**      **Yes**

↓

- a. Refer to “Front Electronics Cage and System Backplane Assembly” on page 9-7 of the *RS/6000 Enterprise Server S70 Installation and Service Guide* for cards.
- b. Continue with step 6.

5. You are removing a card from the rear of the system, refer to “Electronics Cage (Rear View)” on page 10-20 of the *RS/6000 Enterprise Server S70 Installation and Service Guide* for cards. Continue with step 6.
6. Remove the EMC shield for the card location that you are accessing.  
**Note:** If you are removing the EMC shield from the front of the system, remove the two screws that hold the EMC shield to the clock card before attempting to remove the shield from the system.
7. Mark the cables that are attached to the card so you can return them to the correct location during reassembly.
8. Remove the cables attached to the card.
9. Remove the card.

**Replacement:** Replace in reverse order.

## System Backplane Assembly

### Removal

1. Make a note of the locations of parts you remove during this procedure so that you can reinstall them in the correct positions.
2. Power off the system (see “Powering Off and Powering On the System” on page 9-4 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).
3. Disconnect the power cord.
4. Remove the front and rear system covers (see “Covers” on page 9-7 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*).

Refer to “Front Electronics Cage and System Backplane Assembly” on page 10-18 of the *RS/6000 Enterprise Server S70 Installation and Service Guide* for system backplane assembly parts and perform the following steps from the \*\*\* **FRONT** \*\*\* of the system.

5. Loosen the two thumbscrews on the operator panel and swing out the operator panel assembly. Contact the system administrator panel.
6. Disconnect the cables from the operator (op) panel assembly.
7. Remove the op panel assembly from the frame.
8. Remove the upper and lower Front Cage EMC shields.
9. Remove the EMC brackets from around the Front Cage in the following order:
  - Top
  - Left and Right
10. 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.
11. Remove the processor, memory, regulator, and filler cards from the Front Cage.

Refer to “Power Regulators, Cables, and Air Baffles (Rear View)” on page 124 and perform the following steps from the \*\*\* **REAR** \*\*\* of the system.

12. Remove the upper and lower EMC shields from the rear cage assembly.
13. Remove the EMC brackets from around the rear cage in the following order:
  - Top
  - Left and Right

14. 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.
15. Remove the SPCN card, regulators, memory, and filler cards from the top and bottom of the rear cage.
16. Remove the mounting screws from the lower part of the rear cage.
17. Remove the two Cable EMC Shields from the rear cage.
18. Remove the Air Baffle in the lower center of the rear cage.
19. Unplug the cables attached to the upper left and upper right corners of the front cage/system backplane assembly.
20. Remove the 6 'starred' screws that mount the rear cage to the front cage/system backplane assembly.

**CAUTION:**

**This unit weighs between 18 kg (39.7 pounds) and 32 kg (70.5 pounds). Two persons are required to safely move it. Using less than two persons to move it can result in injury.**

21. Remove the rear cage assembly from the back of the system.
22. Unplug the cables attached to the lower left and right corners of the front cage/system backplane assembly.

Refer to “Front Electronics Cage and System Backplane Assembly” on page 10-18 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*. for front cage/system backplane assembly and perform the following steps from the \*\*\*

**FRONT** \*\*\*of the system.

\*\*\* IMPORTANT \*\*\* The front cage/system backplane assembly is heavier on the rear than it is on the front. The front cage/system backplane assembly may tip to the rear if it is not properly handled.

23. Remove the lower mounting screws from the front cage/system backplane assembly.
24. Use two people to remove front cage/system backplane assembly from the front of the system.

**CAUTION:**

**This unit weighs between 18 kg (39.7 pounds) and 32 kg (70.5 pounds). Two persons are required to safely move it. Using less than two persons to move it can result in injury.**



25. Place the front cage/system backplane assembly on the floor in the upright position.
26. Disconnect the op panel cable from system backplane assembly.
27. There are 6 'starred' screws inside the front cage/system backplane assembly that mount the system backplane assembly to the cage. From inside the front cage, remove five of the 'starred' screws.
28. To prevent the system backplane assembly from falling, hold the system backplane assembly to the cage and then remove the last 'starred' screw.
29. Lay the front cage face down on the floor so the system backplane assembly is on top.
30. Remove the system backplane assembly from the front cage.
31. Close all of the connector latches on the new system backplane assembly. The latches need to be closed so they do not interfere with the rear cage when it is installed.
32. To complete the replacement, reverse the previous steps beginning with step 24 on page 116.

**Replacement:** Replace in reverse order.



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## Update 6

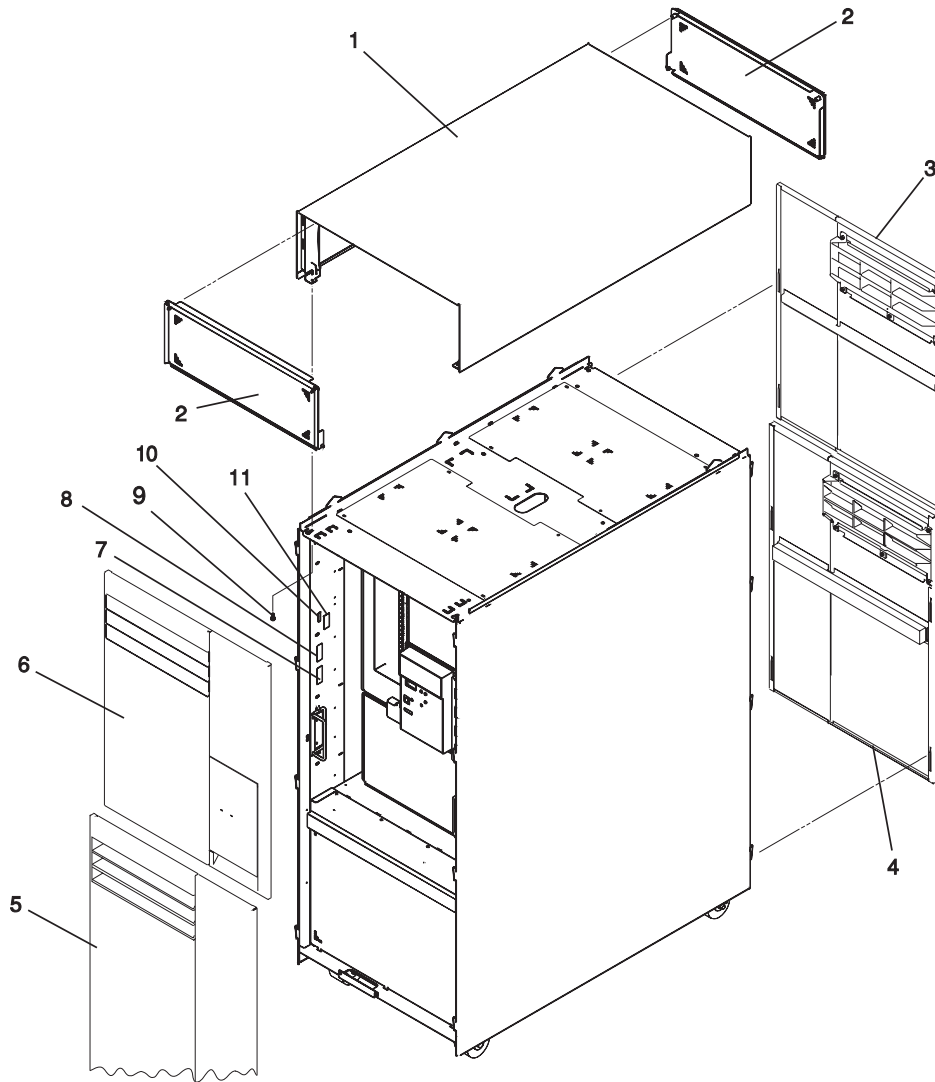
This section contains updates made to the *S70 Installation and Service Guide*, "Chapter 10. Parts."

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## System Rack Parts

This section contains parts information for the System Rack.

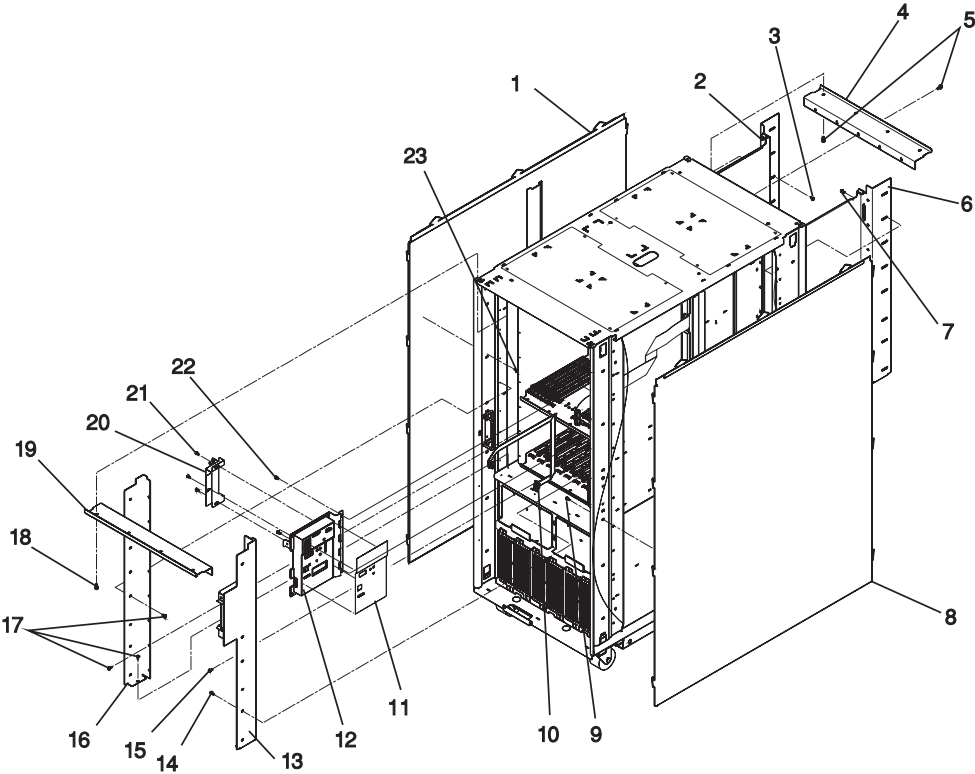
### Front, Rear, and Top Covers



Index	FRU Part Number	Units Per	Description
1	21H7211	1	Cover, top
2	21H7523	2	EMC shield
3	93H5373	1	Upper rear cover assembly (same for -48 volt systems)
4	93H5374	2	Lower rear cover assembly (same for -48 volt systems)
5	93H5374	1	Lower front cover assembly (same for -48 volt systems)
6	93H5363	1	Upper front cover assembly (same for -48 volt systems)
7	44H8386*	1	Label, S/N Barcode (same for -48 volt systems)
8	4438386*	1	Label, MFG work unit control (same for -48 volt systems)
9	1621811	4	Screw, top cover mounting
10	90H6339	2	Label, s/n (same for -48 volt systems)
11	46G3577	1	Label, security (same for -48 volt systems)

| \* For reference only.

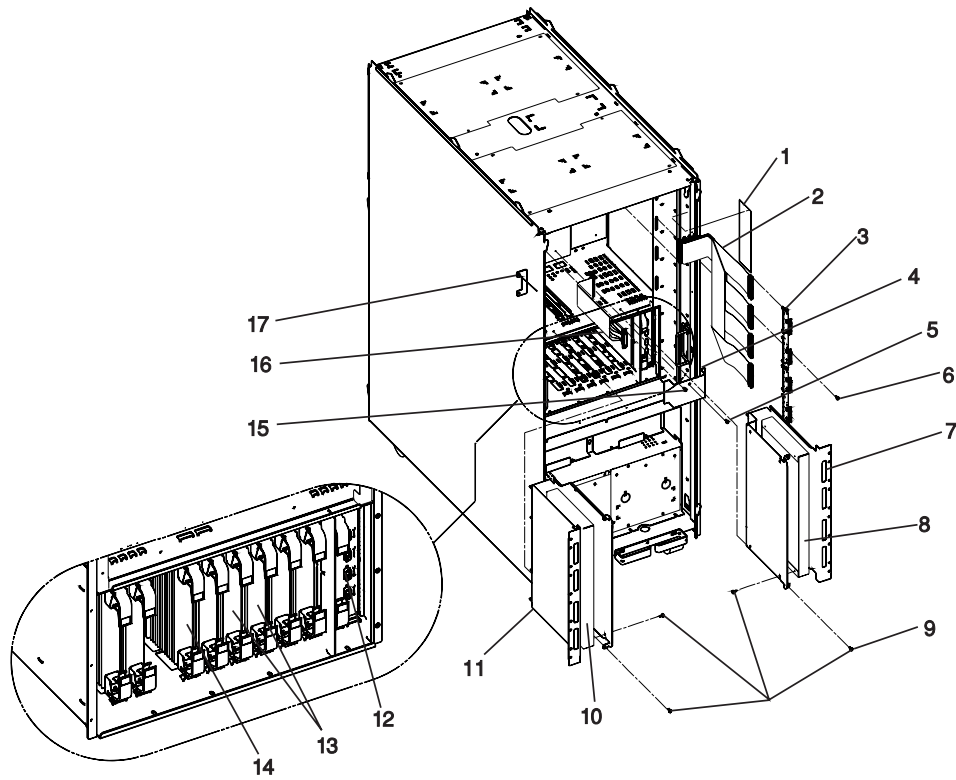
**Operator Panel, Brackets, and Covers (Front View)**



Index	FRU Part Number	Units Per	Description
1	93H5464	1	Left side cover
2	21H7511	1	Bracket, rear left
3	1621811	16	Screw, rear left
4	21H7510	1	Bracket, upper rear
5	1621811	9	Screw, upper
6	21H7512	1	Bracket, rear right
7	1621811	16	Screw, rear right
8	93H5465	1	Right side cover
9	1621811	8	Screw, side cover, M4 x 10
10	21H6996	1	Control panel cable (internal)
11	91H1373	1	Label, operator panel
	90H9774	1	Label, operator panel
12	91H1381	1	Operator panel assembly
13	21H7508	1	Bracket, front right
14	1621811	14	Screw, front right
15	1614920	2	Hex Standoff, operator panel cable
16	21H7509	1	Bracket, front left
17	1621811	16	Screw, front left
18	1621811	9	Screw, upper System Rack
19	21H7505*	1	Bracket, Upper Front
20	21H3733	1	Cover, operator panel connector
21	1621811	3	Screw, connector cover M4 x 10
22	1621811	2	Screw, operator panel M4 x 10
23	1621811	8	Screw, operator panel M4 x 10

| \* For reference only.

### Power Regulators, Cables, and Air Baffles (Rear View)

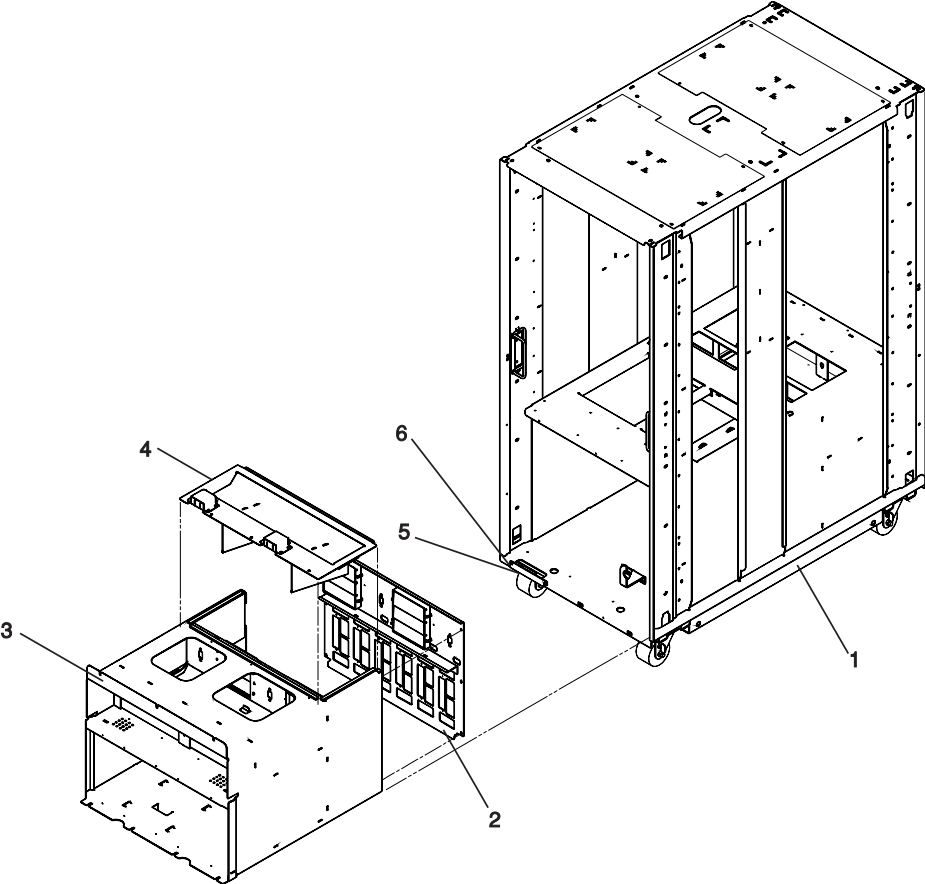




Index	FRU Part Number	Units Per	Description
1	65X2932	1	Label, VCCI
2	21H7376	1	Cable, RIO
3	21H4808	2	RIO card assembly
4	21H8020	1	Air Baffle, lower
5	1621811	1	Screw, air baffle
6	46G3537	8	Hex standoff RIO
7	21H7639	1	Shield, cable
8	21H7660	1	Air Baffle
9	1621811	22	Screw, shield mounting
10	21H7660	1	Air baffle
11	21H7639	1	Shield, cable
12	21H6961	1	SPCN card assembly (see note)
13	21H7100	2	Memory regulator assembly (see note)
14	21H7763	9	Programmable regulator assembly (see note)
15	1614920	2	Hex standoff JTAG
16	90H6513	1	JTAG cable
17	90H6579	1	Bracket, mounting

**Note:** Refer to “S70 Locations” on page 1-9 and “Memory Locations and Ordering Rules” on page 1-20 of the *RS/6000 Enterprise Server S70 Installation and Service Guide* for locations information.

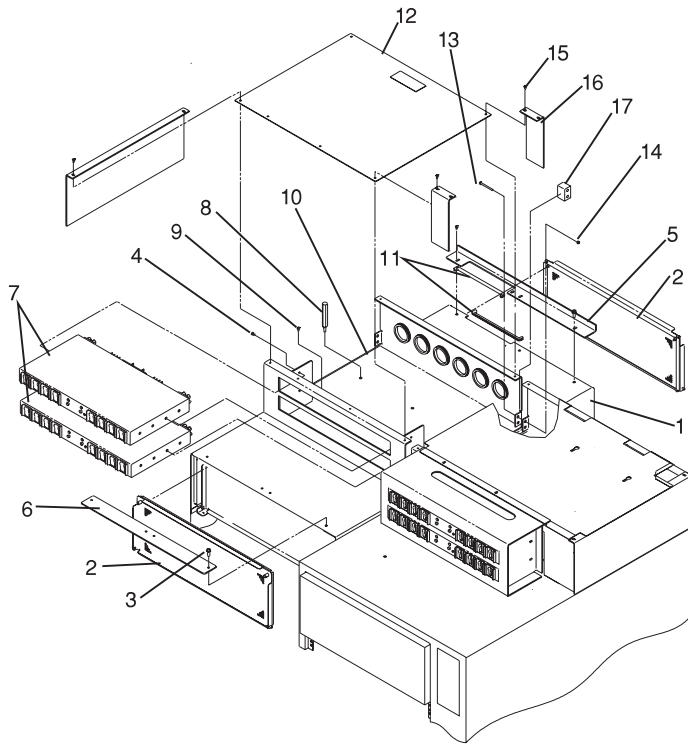
**Power Subframe (Rear View, 1 of 3)**



<b>Index</b>	<b>FRU Part Number</b>	<b>Units Per</b>	<b>Description</b>
1	21H7557	1	Frame Assembly
2	21H7259*	1	Back Cover
3	21H7531*	1	Power subframe assembly
4	21H7513*	1	Top cover
5	21H7248	2	Cable Retainer
6	1621811	4	Screw, M4 x 10

| \* For reference only.

## System Rack -48 Volt Power Distribution Assembly (1 of 2)



Index	FRU Part Number	Units Per	Description
1	93H6142	1	Cover, top
2	21H7523	2	EMC shield
3	1621811	20	Screw, M4 x 10
4	93H4919	8	Screw, 10-32 x 18 SOC H
	1622347	8	Star washer, M5 Ext.
5	93H7960	1	Plate, Cover Rear
6	93H7959	1	Plate, Cover Front
7	93H7381	2	Circuit Breaker Panel
8	52G5554	3	Rod, Top Tray
9	1695141	3	Screw, M6 x 12 HH
10	93H6143	1	Tray, cable
11	50N9504*	2	Grommet
12	94H0318	1	Plate PDP cover
13	1621237	2	Screw
14	1622405	2	Nut
15	1624779	2	Screw, M5 x 14 cover plate mounting
16	94H0124	2	Cover plate, L-bracket
17	93H8225	2	Spacer block

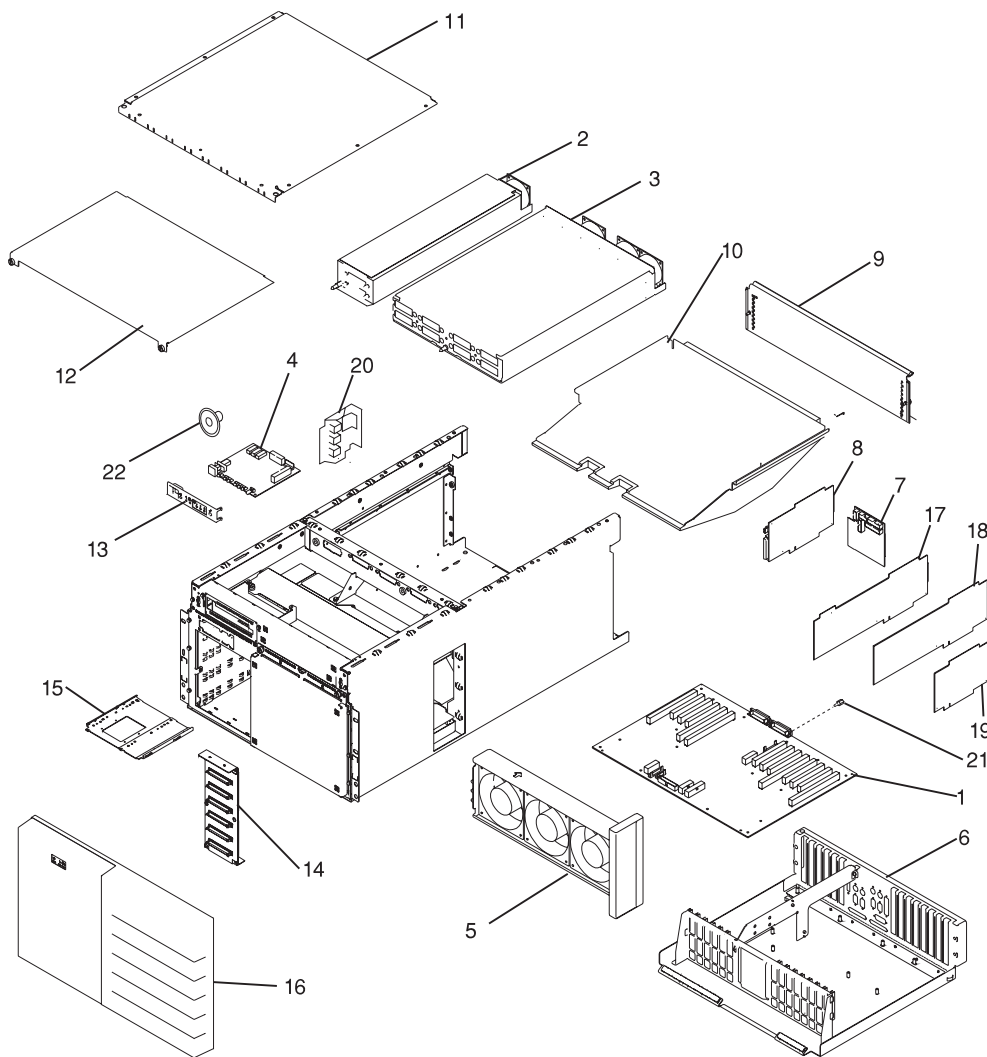
| \* For reference only.

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## Input/Output Rack Parts

This section is for parts that are included in the Input/Output Rack.

### I/O Drawer Parts

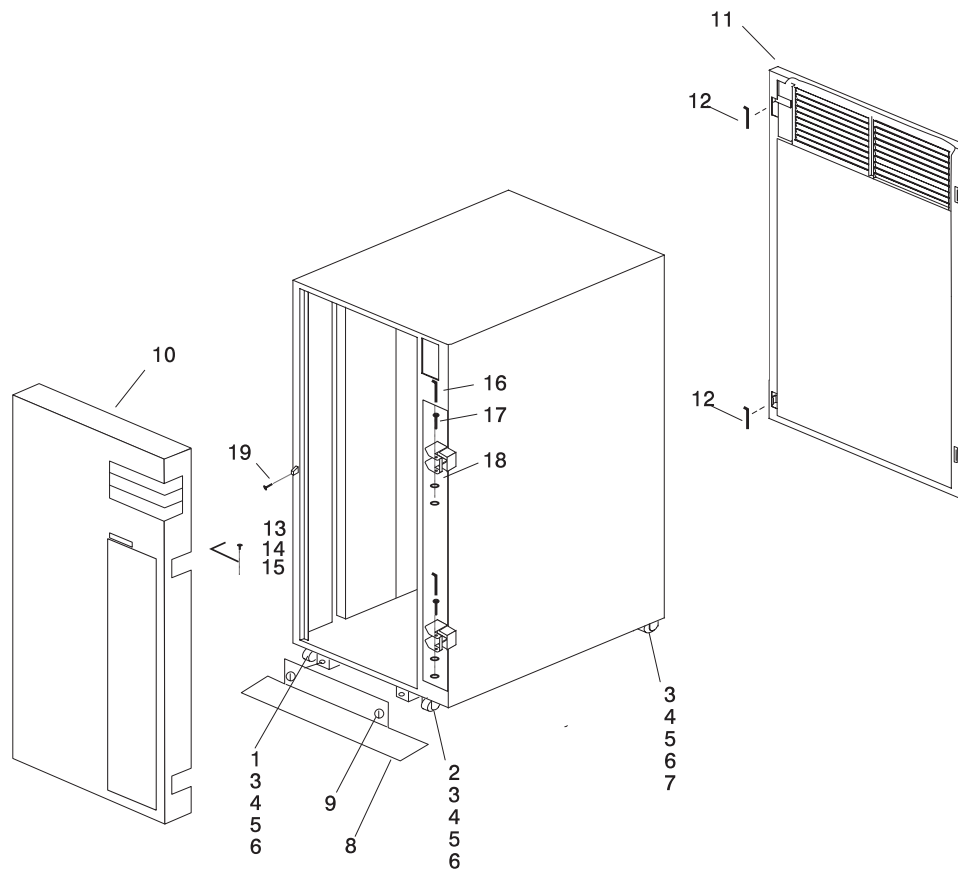


Index	FRU Part Number	Units Per	Description
1	12H0014	1	I/O planar
	94H0800	16	Screw
	1622302	16	Washer
2	93H7905	1	1/4 power supply (AC)
	93H7539	1	1/4 power supply (-48 V dc)
3	93H8714	1	3/4 power supply, (AC)
	93H7542	1	3/4 power supply (-48 V dc)
4	93H8502	1	Indicator Card
	00G1268	4	Screw
5	40H4878	1	Three fan assembly
6	93H2446*	1	I/O tray housing
	00G1268	4	Screw
7	93H8026	1	Gasket 25p D
	93H8027	1	Gasket 15p D
7	93H8185	1	Bulkhead card
	93H8028	6	Standoff (black)
	1622344	6	Lockwasher
	93H6316	6	Standoff (Op, S1, S2 connectors)
	1622344	6	Lock washer
	0438548	4	Screw (K, M, PCI connectors)
8	93H6409	1	SE/SE SCSI redrive card
	27H0863	2	Standoff
	1622344	2	Lockwasher
9	93H4235	1	Cover plate (rear)
10	93H2447	1	Air deflector
11	93H1344	1	Cover plate (top)
	00G1268	9	Screw
12	40H4911*	1	Cover plate (front)
13	40H4880	1	Indicator card bezel
14	93H2166	1	I35 SCSI card
	92F1294	2	Screw
15	40H0423	4	Strapping
	06H2792	1 to 3	Media mounting plate
16	40H4896	1	Cover, drawer front
17	93H2275	1	Service processor (SP) card
18	See note.		Adapters, I/O adapters other than primary drawer SCSI adapters.
19	See note.	2	SCSI Adapters (slots 2 and 9 of the primary I/O Drawer only)
20	40H4864	1	Fan power bracket
	00G1268	1	Screw
21	46G3537	4	RIO Standoff
22	93H4231	1	Speaker
	See note.		Disk drives or media devices

\* For reference only.

**Note:** See *Diagnostic Information for Multiple Bus Systems* for part numbers.

## Input/Output Rack Covers

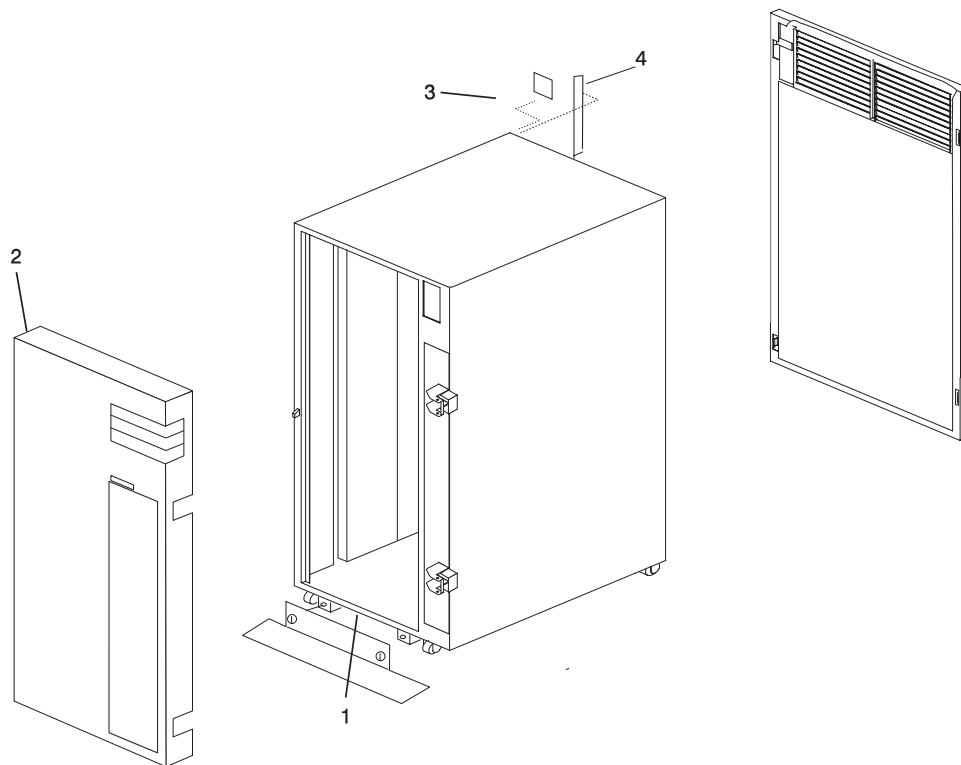




Index	FRU Part Number	Units Per	Description
1	89X2627	1	Caster, (offset) left
2	89X2628	1	Caster, (offset) right
3	1621823	16	Screw, hex Hd w/washer, self tap, M6 x 16
4	1622306	16	Washer
5	1622320	16	Lock washer
6	1621596	16	Screw
7	62X3601	2	Caster, Swivel
8	93H8181	1	Stabilizer
9	93H9182	2	Thumbscrews
10	93H7817	1	Front Door
11	93H8220	1	Rear Door
12	11F0118	2	Hinge pin, rear door
13	1621098	2	Screws
14	93H7378*	1	Ground Strap
15	1622348	2	Star Washers
16	93H7372*	2	Pins
17	93H7374*	2	Bearings
18	0027760*	2	Washers
19	07L7168	1	Door Ramp Mounting Screw, M3 x 10

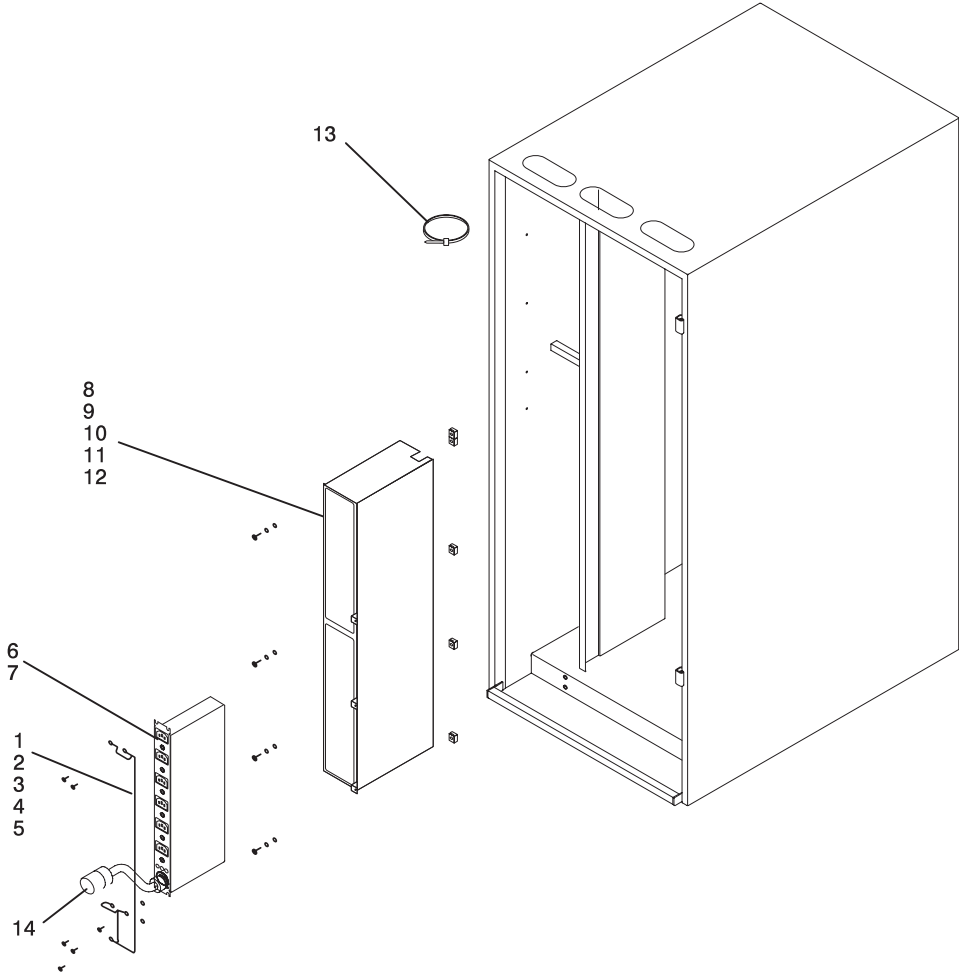
| \* For reference only.

## Input/Output Rack Labels



Index	FRU Part Number	Units Per	Description
1	69X1264	1	Label, safety (English)
1	62X3442	1	Label, safety (U.K./English)
1	62X3476	1	Label, safety (Spanish)
1	62X3477	1	Label, safety (Norwegian)
1	62X3478	1	Label, safety (Dutch)
1	62X3479	1	Label, safety (Finnish)
1	62X3483	1	Label, safety (Italian)
1	62X3493	1	Label, safety (German)
1	62X3531	1	Label, safety (Danish)
1	62X3532	1	Label, safety (French)
1	62X3533	1	Label, safety (French/Dutch)
1	62X3534	1	Label, safety (Japanese)
1	62X3538	1	Label, safety (Swedish)
1	69X1279	1	Label, safety (Portuguese)
1	69X1281	1	Label, safety (Italy/Germany/France)
1	69X1264	1	Label, safety (Canada/French)
2	59F3003	1	Nameplate, U.S.
3	69X1262	1	Label, rack identifier
4	62X3561	1	Label, EIA identifier

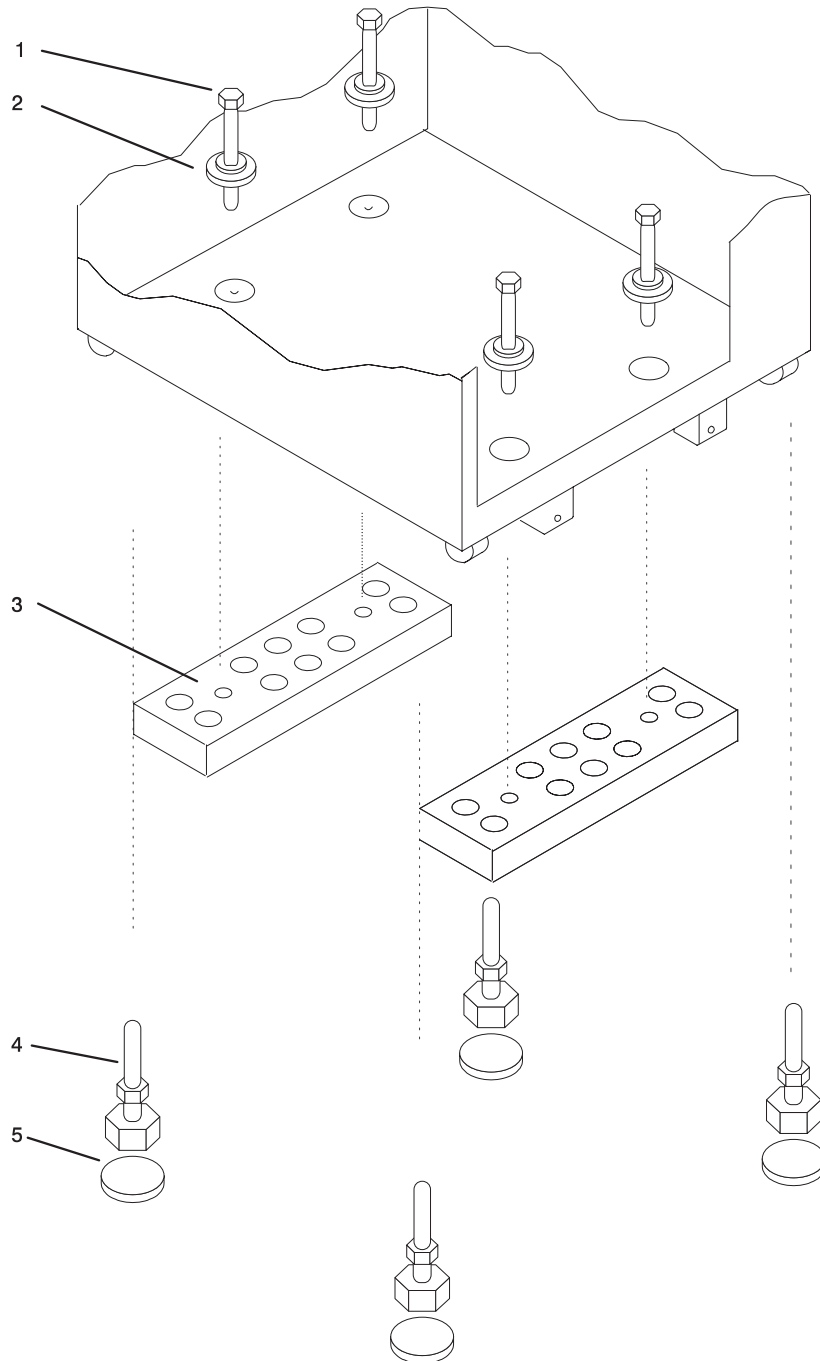
# Power Distribution Bus



Index Number	FRU Part Number	Units Per Assy	Description
1	88G0165	1	Ground wire harness
2	1624779	1	Screw
3	00G1268	1	Screw
4	1622347	1	Lock washer
5	1622346	1	Washer
6	52G6059	Up to 2	Power distribution bus - single phase
6	93H6453	Up to 2	Power distribution bus - single phase, WT
6	52G6060	Up to 2	Power distribution bus - two of three phase, WT
6	52G6061	Up to 2	Power distribution bus - three phase (Switzerland)
7	1624779	4	Screw
8	52G6112	1	Enclosure
9	1624779	4	Screw
10	1622347	4	Lock washer
11	1622305	4	Washer
12	0375867	3	Nut clip
13	32G0111		Cable restraint strap
14	*See note		Cord, power

**Note:** See "Power Cords" on page 142 for power cord part numbers.

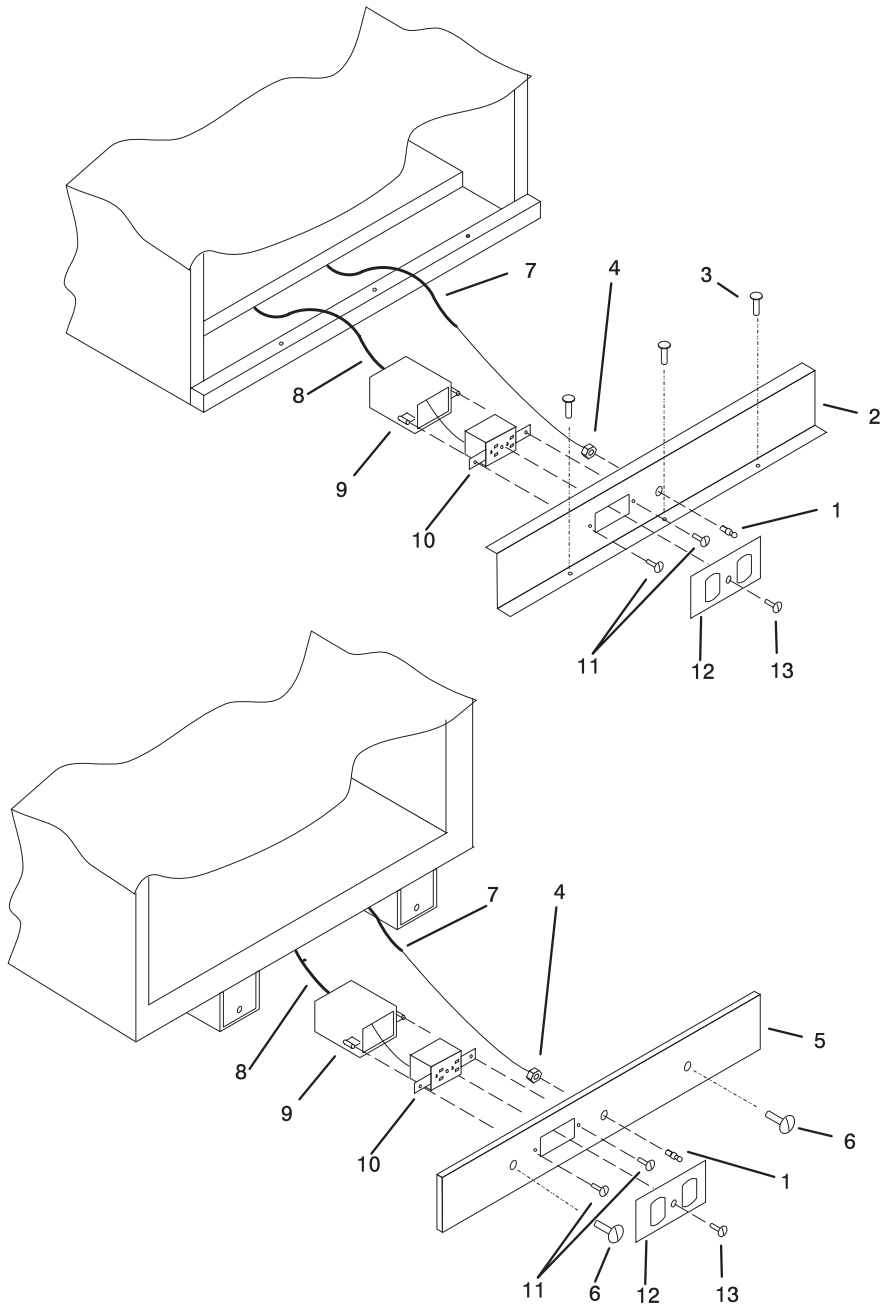
## Leveling Feet and Bolt Down Hardware



<b>Index Number</b>	<b>FRU Part Number</b>	<b>Units Per Assy</b>	<b>Description</b>
1	88G4725*	4	Mounting Bolts
2	65G3593*	4	Plastic isolator Washer, 15.8mm
3	52G5650*	2	Mounting Plates
4	52G6058*	4	Levelling Feet
5	88G4727*	4	Plastic Isolator Pads

| \* For reference only.

## Accessory Electrical Outlet Mounting Plates



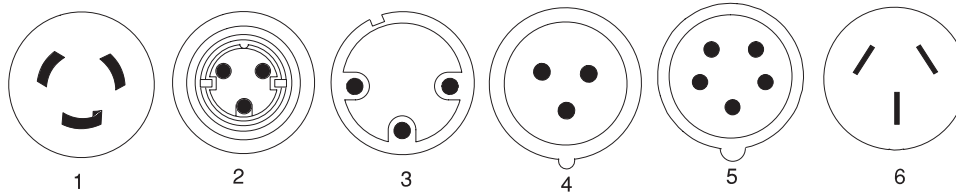


Index Number	FRU Part Number	Units Per Assy	Description
1	52G5643*	1 per plate	Clip Stud for Grounding Wire
2	94H0608	1	Rear Electrical Mounting Plate
3	1624779	3	M5 x 14mm Mounting Screws
4	1622403	1 per plate	M4 x 0.7 Nut for Grounding Wire
5	94H0609	1	Front Electrical Mounting Plate
6	93H9182	2	Thumbscrews
7	40H0455	1	Grounding Cable
8	n/a	1	Power Cable
9	n/a	1	AC Outlet Box
10	n/a	1	AC Outlet
11	n/a	2	AC Outlet Mounting Screws
12	n/a	1	AC Outlet Cover Plate
13	n/a	1	AC Outlet Cover Plate Mounting Screw

| \* For reference only.

**Note:** Part numbers 8 through 13 in this diagram are customer supplied and maintained parts. These parts are not FRUs.

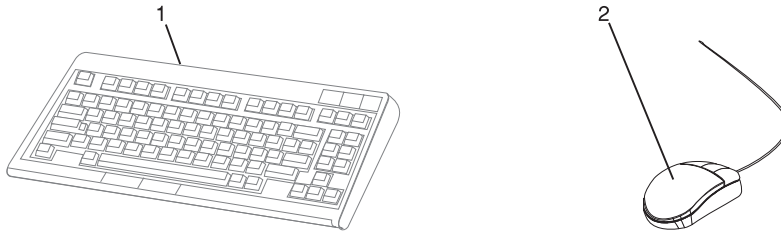
## Power Cords



Index Number	FRU Part Number	Units Per Assy	Description
1	11F0113	2	For System Rack or Input/Output Rack, U.S. standard, type 12 plug, L6-30P, 250V, single phase, 14 ft., 30A Canada, U.S.A.
1	11F0114	2	For System Rack or Input/Output Rack, U.S. Chicago, type 12 plug, L6-30P, 250V, single phase, 6 ft., 30A Chicago, Illinois, U.S.A.
1	11F0115	2	For System Rack or Input/Output Rack, AFE, type 12 plug, L6-30P, 250V, single phase, 14 ft., 30A Argentina, Bahamas, Bangladesh, Barbados, Bermuda, Bolivia, Brunei, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Hong Kong, India, Indonesia, Jamaica, Japan, Maco, Malaysia, Mexico, Myanmar, Netherlands Antilles, Panama, Peoples Republic of China, Peru, Philippines, Singapore, Sri Lanka, Suriname, Uruguay, Venezuela
2	46F4593	2	For System Rack or Input/Output Rack, U.S. Chicago, WP, type 40 plug, R&S 3750, 250V, single phase, 6 ft., 30A Chicago, Illinois U.S.A
2	46F4594	2	For System Rack or Input/Output Rack, U.S., WP, type 40 plug, R&S 3750, 250V, single phase, 14 ft., 30A U.S.A.
3	11F0106	2	For System Rack or Input/Output Rack, Wilco WP, type PDL, 250 V, single phase, 14ft., 30A Australia
3	11F0107	2	For System Rack or Input/Output Rack, Wilco WP, type PDL, 250 V, single phase, 14ft., 30A, right angle New Zealand

Index Number	FRU Part Number	Units Per Assy	Description
4	21H7693	2	For System Rack or Input/Output Rack, IEC 309, type 46 (2P+G), 250 V, single phase, 14ft., 32A New Zealand Belgium, Bahrain, Egypt, France, Greece, Iceland, Iraq, Ireland, Italy, Jordan, Kuwait, Lebanon, Malawi, Norway, Oman, Portugal, Qatar, Saudi Arabia, Spain, Turkey, U.K., United Arab Emirates
5	21H7691	1	For System Rack, IEC 309, type 46 (3P+N+G), 250 V, two of three phase, 14ft., 16A Austria, Czech Republic, Denmark, Estonia, Finland, Israel, Latvia, Lithuania, Netherlands, Norway, Pakistan, Portugal, Russia, South Africa, Sweden, Switzerland, Turkey
5	88G4763	1	For Input/Output Rack, IEC 309, type 46 (3P+N+G), 250 V, two of three phase, 14ft., 32A Austria, Czech Republic, Denmark, Estonia, Finland, Israel, Latvia, Lithuania, Netherlands, Norway, Pakistan, Portugal, Russia, South Africa, Sweden, Turkey
5	88G4764	1	For Input/Output Rack, IEC 309, type 46 (3P+N+G), 250 V, three phase, 14ft., 16A Switzerland
6	87G6067	2	For System Rack or Input/Output Rack, type KP, right angle, 250V, single phase, 14 ft., 30A Korea

## Keyboards



Index Number	FRU Part Number	Units Per Assy	Description
1	93H8120	1	Keyboard, 101 United States English (ID 103P)
	93H8121	1	Keyboard, 102 Canada French (ID 058)
	93H8122	1	Keyboard, 102 Canada French (ID 445)
	93H8123	1	Keyboard, 102 Spanish (ID 171)
	93H8124	1	Keyboard, 104 Brazil Portuguese (ID 275)
	93H8125	1	Keyboard, 102 Arabic (ID 238)
	93H8126	1	Keyboard, 102 Belgium French (ID 120)
	93H8127	1	Keyboard, 102 Belgium (ID 120)
	93H8128	1	Keyboard, 102 Bulgarian (ID 442)
	93H8129	1	Keyboard, 102 Czech (ID 243)
	93H8130	1	Keyboard, 102 Danish (ID 159)
	93H8131	1	Keyboard, 102 Dutch (ID 143)
	93H8132	1	Keyboard, 102 French (ID 189)
	93H8133	1	Keyboard, 102 German (ID 129)
	93H8134	1	Keyboard, 102 Greek (ID 319)
	93H8135	1	Keyboard, 101 Hebrew (ID 212)
	93H8136	1	Keyboard, 102 Hungarian (ID 208)
	93H8137	1	Keyboard, 102 Iceland (ID 197)
	93H8138	1	Keyboard, 102 Italy (ID 142)
	93H8139	1	Keyboard, 102 Norwegian (ID 155)
	93H8140	1	Keyboard, 102 Polish (ID 214)
	93H8141	1	Keyboard, 102 Portuguese (ID 163)
	93H8142	1	Keyboard, 102 Romainian (ID 446)
	93H8143	1	Keyboard, 101 Russian (ID 443)
	93H8144	1	Keyboard, 102 Serbian (ID 118)
	93H8145	1	Keyboard, 102 Slovak (ID 245)
	93H8146	1	Keyboard, 102 Spanish (ID 172)
	93H8147	1	Keyboard, 102 Sweden/Finland (ID 153)
	93H8148	1	Keyboard, 105 Swiss F/G (ID 150)
	93H8149	1	Keyboard, 102 Turkish (ID 179)
	93H8150	1	Keyboard, 102 Turkish (ID 440)
93H8151	1	Keyboard, 102 UK English (ID 166)	
93H8152	1	Keyboard, 102 Latvia (ID 234)	
93H8153	1	Keyboard, US English ISO9995 (ID 103P)	
93H8154	1	Keyboard, 106 Japan (ID 194)	
93H8155	1	Keyboard, 101 Chinese/US (ID 467)	
93H8156	1	Keyboard, 103 Korea (ID 413)	
93H8157	1	Keyboard, 101 Thailand (ID 191)	
2	76H5084	1	Three Button Mouse

---

## Update 7

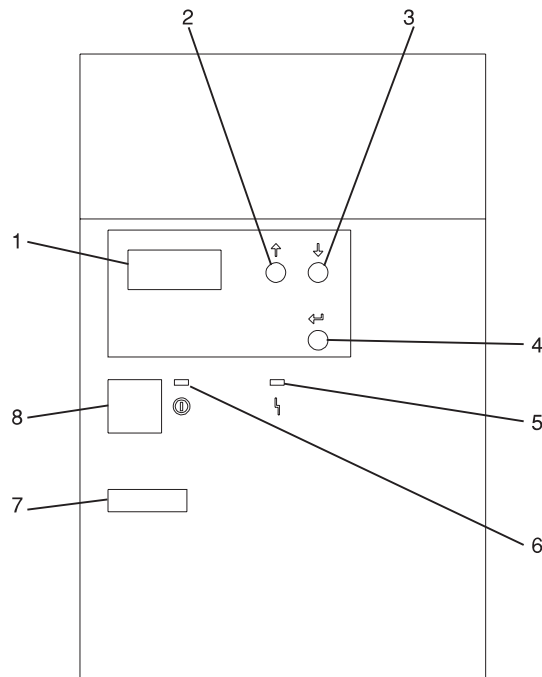
This section contains updates made to the *S70 Installation and Service Guide*, "Appendix A. Operator Panel Functions."



### 3. Operator Panel Functions

#### System Rack Operator Panel

The following diagram shows the locations of the operator panel display and the operator panel.



- 1 Operator Panel Display
- 2 Scroll Up Pushbutton
- 3 Scroll Down Pushbutton
- 4 Enter Pushbutton
- 5 Attention LED
- 6 Power On LED
- 7 Serial Number
- 8 Power Pushbutton

## Function Code Table

The operator panel functions and descriptions are listed in the following table. For details about the function, see "Operator Panel Function Descriptions" on page 150.

### Notes:

1. The x can be any number 0 through 9, any letter A through F, or a blank.
2. If the function was being performed by the customer, verify why the function was selected and if it is complete.
3. If you cannot change the Function/Data display or complete the selected function, go to "Starting Point for All Problems" in the Problem Analysis information for your system.
4. Bold function codes indicate supported codes for trained service personnel.

<i>Table 3 (Page 1 of 3). Operator Panel Function Codes</i>	
<b>Function Code</b>	<b>Function Selected</b>
<b>01 xxxx xxxx</b>	Pressing the Enter button toggles between: <ol style="list-style-type: none"> <li>1. Display the currently selected IPL type.</li> <li>2. Display the currently selected IPL speed override for the next IPL.</li> </ol>
<b>02 xxxx xxxx</b>	<ol style="list-style-type: none"> <li>1. Pressing the Enter button once allows selection of the IPL types A or B (and mode on some system types). <b>Attention:</b> IPL types C and D are for trained service personnel only and may cause data loss if used improperly.</li> <li>2. Pressing the Enter button twice allows selection of an IPL speed override for the next IPL. Subsequent IPLS are performed at the system selected speed.</li> </ol>
<b>03 xxxx xxxx</b>	Start an IPL and load the system. The IPL uses the selected IPL options. <b>Note:</b> This may cause the system to power off and then back on.
<b>04 xxxx xxxx</b>	Lamp test; all displays and indicators are switched on.
<b>05 xxxx xxxx</b>	Informational System Power Control Network (SPCN) system reference code (SRC); displays an SRC on the operator panel. <b>Note:</b> Function 5 reference codes will only be displayed if the function code is changed from the default function 11 position.
06 xxxx xxxx	Reserved



<i>Table 3 (Page 2 of 3). Operator Panel Function Codes</i>	
<b>Function Code</b>	<b>Function Selected</b>
<b>07 xxxx xxxx</b>	<p><b>Attention:</b> This function allows concurrent maintenance to be performed by trained service personnel. Inadvertent use may cause system failures.</p> <p>Pressing the Enter button allows execution of the following sub-functions to restore system power and perform concurrent maintenance.</p> <p>**           Cancel Request</p> <p><b>01</b>           System Power On</p> <p><b>02</b>           Blower Power Off</p> <p><b>03</b>           Bulk Power Off</p> <p><b>04</b>           Blower Power On</p> <p><b>05</b>           Bulk Power On</p>
<b>08 xxxx xxxx</b>	Fast power off.
09 xxxx xxxx through 10 xxxx xxxx	Reserved
<b>11 xxxx xxxx</b> through <b>19 xxxx xxxx</b>	System reference code (SRC); displays an SRC on the operator panel.
20 xxxx xxxx	Reserved
21 xxxx xxxx	Reserved
<b>22 xxxx xxxx</b>	Initiates AIX dump.
23 xxxx xxxx	Reserved
24 xxxx xxxx	Reserved
<b>Note: Do not use functions 25 or higher unless directed to by service support personnel.</b>	
25 xxxx xxxx	The service representative switch 1 is set; this function is the first step necessary to set the service function range from 50 to 70.
26 xxxx xxxx	The service representative switch 2 is set; this function is the second step necessary to set the service function range from 50 to 70.
27 xxxx xxxx through 31 xxxx xxxx	Reserved
32 xxxx xxxx	Reserved
33 xxxx xxxx	Reserved
34 xxxx xxxx	Reserved
35 xxxx xxxx through 49 xxxx xxxx	Reserved
50 xxxx xxxx	System processing unit stop.
51 xxxx xxxx	System processing unit status. Displays the following values: B0 register contents, System instruction address register (IAR) address, Current task dispatching element (TDE) contents.

<i>Table 3 (Page 3 of 3). Operator Panel Function Codes</i>	
<b>Function Code</b>	<b>Function Selected</b>
52 xxxx xxxx	System processing unit start.
53 xxxx xxxx	Path switch and reset.
54 xxxx xxxx	Reserved
55 xxxx xxxx	Display low-level diagnostic service processor log buffer.
56 xxxx xxxx	Display low-level diagnostic service processor code area.
57 xxxx xxxx	Reserved
58 xxxx xxxx	Display low-level diagnostic IPL parameters area.
59 xxxx xxxx	Set first character of base address for function 62 display.
60 xxxx xxxx	Set second character of base address for function 62 display.
61 xxxx xxxx	Set third character of base address for function 62 display.
62 xxxx xxxx	Display service processor control storage.
63 xxxx xxxx	System status SRC trace.
64 xxxx xxxx	Service processor diagnostic status SRC trace.
65 xxxx xxxx	Reserved
66 xxxx xxxx	Reserved
67 xxxx xxxx	Reserved
68 xxxx xxxx	Reserved
69 xxxx xxxx	Reserved
70 xxxx xxxx	Reserved
You cannot find the code in this chart.	If you cannot find the function code in this chart, the customer support for added features or devices may not have been available when this information was produced. Look for any supplement unit function code information for the function code you have displayed on the operator panel. If you do not find any additional function code information, go to "Function 04 - Lamp Test" on page 152 and verify that the lamps are working correctly.

## Operator Panel Function Descriptions

### Values for IPL Types and Speeds

See Table 4 and Table 5 on page 151 for tables of valid IPL types and speeds used in operator panel functions 01 and 02.

<i>Table 4 (Page 1 of 2). IPL Types</i>	
<b>IPL Type</b>	<b>Description</b>
A	IPL using copy A of the system firmware.

IPL Type	Description
B	IPL using copy B of the system firmware.
C	<b>Attention:</b> Not supported; may cause data loss if used.
D	<b>Attention:</b> Not supported; may cause data loss if used.

IPL Speed	Description	Details
F:	Fast Override	Fast diagnostics run. The following are skipped: <ul style="list-style-type: none"> <li>• Mainstorage tests</li> <li>• CEC Inter-chip interface tests (wire test)</li> <li>• Extended Logical Build-in Self Tests</li> <li>• Also, cache data is not provided in mainstorage dumps.</li> </ul>
S:	Slow Override	Full hardware diagnostics run. Use whenever hardware is changed, for intermittent hardware failures and on the first install IPL.
V = (F or S):	Use system selected speed	

### Function 01 - Display Selected IPL Type, Mode and Speed

This function allows you to display the IPL type and IPL speed. Pressing the Enter button in Function 01 toggles between:

1. Display IPL type (A or B).
2. Display IPL speed (F, S, or V = F or V = S).

Function/Data	Description
01 _ _ _ _ _	Use the scroll up or scroll down buttons and scroll to Function 01.
01 _ _ _ A _ _	Press Enter to enter Function 01 Selected IPL Type display. Valid types, which appear in the sixth character position of the Function/Data display are A or B. See Table 4 on page 150 for descriptions of IPL types.
01 _ _ V = F _	Use Enter again to toggle to Selected IPL Speed display. Valid speed displays are F, S, V=F or V=S. <ul style="list-style-type: none"> <li>• F: Fast override selected.</li> <li>• S: Slow override selected.</li> <li>• V = (F or S): Use system selected speed.</li> </ul>
01 _ _ _ A _ _	Use Enter to toggle to Selected IPL Type display.

## Function 02 - Select IPL Type, Mode and Speed

This function allows you to select the IPL type and IPL speed. System power must be off to change IPL speed.

1. Pressing Enter once puts you into the change IPL type (A or B) operation.

**Attention:** IPL types C and D are not supported and may cause data loss if used.

2. Pressing the Enter button twice puts you into the operation for overriding the system IPL speed (F, S, V) for the next IPL. Subsequent IPLs are performed at the system selected speed.

For example, if you want to select IPL Type, select Function 02. Push the Enter button once, and then use the scroll up or scroll down button to select an IPL type. Pressing Enter again saves that value and exits the Select IPL Type display.

If you want to change the IPL speed, you must have system power off. Select Function 02, push the Enter button twice, use the scroll up or scroll down button to select F, S, or V and then press Enter to activate the override (F or S) or cancel it (V) and exit the Select IPL Speed display. See Table 5 on page 151 for recommended speed settings.

Function/Data	Description
02 _ _ _ _ _	Use the scroll up or scroll down button and scroll to Function 02.
02 _ _ _ A _ _	Press Enter once to enter Function 02. Select IPL Type display. Use the scroll up or scroll down buttons to scroll through the IPL types A, B, C and D. See Table 4 on page 150 for descriptions of IPL types. Pressing Enter saves the selected IPL type and exits Function 02.

## Function 03 - Start IPL

Function 03 is enabled only when the system is powered on.

This function starts an IPL using the selected IPL mode when the Enter button is pressed.

- | **Note:** The system may power off and then back on as part of the IPL.

## Function 04 - Lamp Test

This function ensures that no indicators are burned out and that characters displayed at the operator panel are valid. When this test is activated, the following lights go on:

- On the system operator panel:
  - The System Attention light
  - The Power On light
  - A 5 x 7 dot pattern for each character in the Function/Data display.

The lamp test continues on the system operator panel until you perform another operator panel function or a power procedure.

Use this procedure to verify that the lights on the system operator panel are working correctly. If you cannot complete these steps, go to the "Starting Point for All Problems" in the Problem Analysis information for your system to start problem analysis.

1. Power on the system.
2. Press the scroll up or scroll down button on the operator panel to display Function 04.

Press Enter on the operator panel.

3. Do all of the following lights on the operator panel go on?
  - System Attention light
  - Power On light
  - A 5 x 7 dot pattern for each character in the Function/Data display.

**Yes**        The lights on the system operator panel are working correctly.

**No**         Exchange the operator panel or the ac module.

This ends this procedure.

### Function 05 - SPCN (System Power Control Network) Informational SRC

Function 05 displays information about power faults and provides informational reference codes during concurrent maintenance procedures. The format for this function is as follows:

05	1RRU rrrr
----	-----------

RR = Frame number refers to the particular I/O Drawer or System Rack  
 U = Always 1 for information pertaining to the System Rack or I/O Drawers other than the primary.  
 Always C is for the primary I/O Drawer.  
 rrrr = Service reference code (SRC)

**Note:** Function 5 reference codes are only displayed if the operator panel selection is moved from the default function 11 position.

### Function 07 - Restore System Power and Perform Concurrent Maintenance Repair

**Attention:** This function allows concurrent maintenance to be performed by trained service personnel. Inadvertent use may cause system failures.

Function 07 is available only when the system is powered on. It is used for concurrent maintenance repair on bulk power supplies and blowers.

When Function 07 is first entered, the operator panel enters **subfunction mode** by displaying \*\*. Increment and decrement functions scroll to selectable values. If an SPCN communications error is present when a subfunction is selected, the subfunction is not executed and FF (execution failed) displays in the rightmost display positions. Entry of a valid subfunction when no SPCN communications errors are present results in a 00 (execution successful) displays in the rightmost display positions. Pressing Enter when \*\* is displayed results in exiting subfunction mode.

<i>Table 8. Function 07 Restore System Power and Perform Concurrent Maintenance Repair</i>	
<b>Function/Data</b>	<b>Description</b>
07 _ _ _ _ _	Use increment or decrement functions and scroll to Function 07.
07 * * _ _ _ _	Press Enter once to enter Function 07 subfunction mode.
07 0 4 _ _ _ _	Use the increment or decrement buttons to scroll desired subfunction (04 in this example). Valid subfunctions are 01, 02, 03, 04 and 05.
07 0 4 _ _ 0 0 briefly, then 07 * * _ _ _ _	Press Enter to execute subfunction 04. An SPCN communications error was not present, resulting in 00. If an error occurs, FF displays.
07 F 3 _ _ 0 0	Use the increment or decrement buttons to select a specific device (in this case F0 - F3).
07 0 4 _ _ 0 0 briefly, then 07 * * _ _ _ _	Press Enter to exit the subfunction for the specified device and exit the subfunction level.

**\*\* Cancel Request**

This subfunction is returned when the user selects \*\* for subfunction and activates Enter. This is used to cancel a pending subfunction 2 - 5 concurrent maintenance operation. SPCN responds with an EPF 1 - 5 to clear any other subfunction range previously enabled.

- 01**      System Power On
- This command causes a Rack Power On command to be transmitted to the network, if the CEC is powered on. This function is used to restore power to towers turned off or faulted off after concurrent repairs have been completed.
- 02**      Blower Power Off
- This function is used to select a concurrent blower power off operation. SPCN responds by enabling subfunction range F0 - F3 to select the blower to be powered off.
- 03**      Bulk Power Off
- This function is used to select a concurrent bulk power off operation. SPCN responds by enabling subfunction range B0 - B5 to select the bulk to be powered off.
- 04**      Blower Power On
- This function is used to select a concurrent blower power on operation. SPCN responds by enabling subfunction range F0 - F3 to select the blower to be powered on.
- This function is only needed if the wrong blower is powered off. A concurrently repaired blower is automatically started after the blower is inserted.
- 05**      Bulk Power On
- This function is used to select a concurrent bulk power on operation. SPCN responds by enabling subfunction range B0 - B5 to select the bulk to be powered off.
- This function is only needed if the wrong bulk is powered off. A concurrently repaired bulk is automatically started after the bulk is installed.
- F0 - F3**      Select Blower
- This subfunction is used to select the blower for the previously selected concurrent repair operation. If accepted, SPCN performs the operation and disables this subfunction range. A function 5 SRC is displayed when the blower is turned off and removed when the blower is installed.
- B0 - B5**      Select Bulk
- This subfunction is used to select the bulk for the previously selected concurrent repair operation. If accepted, SPCN performs the operation and disables this subfunction range. A function 5 SRC is displayed when the bulk is turned off and removed when the bulk is installed.

## Function 08 - Fast Power Off

Use this function when the system is suspended and a power down cannot be performed.

Initially, an attention SRC (11-x A1xx 8008) is displayed. This indicates that Function 08 has been selected.

**Note:** If the server has Unattended Start Mode (USM) enabled, selecting this function causes the server to power off and then power on again.

## Functions 09 to 10 - Reserved

These functions are reserved for future operator panel operations.

## Functions 11 to 19 - System Reference Code

Functions 11 through 19, if enabled, represent the words of the SRC.

**Note:** Function 11 provides the primary SRC. Function 12 is an informational status message only and not used. Functions 14 and 15 provide secondary reference codes in addition to the primary SRC. Function 13 provides status information for service support use.

Press Enter to view the SRC. If no SRC is present, press Enter to continue to the next function.

SRC information should be recorded for error reporting. For example, the system processor detected a failure.

1. Look at the four rightmost characters of the operator panel display for function 11. These four characters are the unit reference code.
2. Look at functions 14 and 15 for more reference codes. Each is four characters in length. There may be from zero to four unit reference codes contained in these words. For example:

Word 11 - B455 rrrr

Word 14 - rrrr rrrr

Word 15 - rrrr 0000

This example shows a total of four reference codes for this failure. The rrrr signifies the reference codes. Each reference code has only one FRU associated with it.

3. Find the unit reference code in the SRC tables.

**Note:** Depending on the source of the SRC, some functions do not report any SRC status. All SRCs start with information in Function 11.



For more information on interpreting SRCs, refer to Chapter 3, on page 3-1, and *Unit Reference Codes* on page 6-25 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*.

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## Extended Operator Panel Functions

The extended operator panel functions provide greater debug capability for the S70. Function 22 is used by trained service personnel to provide an AIX dump to media. **Functions 25 and higher are primarily enabled for product engineering test and evaluation only.** These are referred to as restricted panel functions. Functions 50 through 70 are available only by using functions 25 and 26 which act as switches to allow access to functions 50 through 70.

**Note:** When a function is not available, either FF is displayed, or the function may not be selectable.

### Function 22 - AIX Storage Dump

This function is supported only during AIX runtime, and it must have been previously setup and enabled from AIX. Refer to *AIX Problem Solving Guide* for more information about dumps.

**Note:** If dump capability has not been enabled from AIX, attempting to initiate a dump results in the response D1068000 and the system powers off and reboots.

To initiate a dump:

1. Select Function 22 on the operator panel and press Enter. The response A1003022 displays on the operator panel.
2. Select Function 22 again and press Enter. The response D1823080 displays on the operator panel. This indicates the dump request has been accepted by AIX, and the process continues, displaying 4-character progress messages.
3. When the dump is complete, the system automatically powers off and reboots according to the power-on timer setting.

**Attention: Functions 25 and higher are primarily enabled for product engineering test and evaluation only.**

### Functions 25 and 26 - Switches 1 and 2

Switches 1 and 2 can be used to enable or disable the Functions 50 through 70. If Functions 50 through 70 are enabled, entry of either switch disables them. If the Functions 50 through 70 are disabled, entry of service switch 1 followed by service switch 2 enables them.

A data response of 25 \_\_\_ \_00 or 26 \_\_\_ \_00 is always returned. It is followed by the display of the present IPL mode (Function 01) if the extended function range has been changed.

---

## Restricted Panel Functions

These functions are enabled when Functions 25 and 26 are entered. The following is a list of all the panel functions and a description of each.

Service Functions 50 through 70 are available when switch 1 (Function 25) has been entered, followed by the entry of switch 2 (Function 26). The restricted panel functions may be disabled again by selecting and entering either switch 1 (Function 25) or switch 2 (Function 26).

**Note:** Low-level debug functions are available only after a terminating error.

## Using Subfunctions

Subfunctions are used with Functions 51 and 55 through 64. After selecting and entering the function, the subfunction field appears with two asterisks. You may now select and enter a subfunction value. When selected and entered, actual data YY FF (where YY is the function number) is displayed. The "YY FF" response indicates that no data is present for this subfunction value. The data is displayed as eight hexadecimal digits, which is 4 bytes of data.

These steps may be repeated for different subfunction values. To exit subfunctions, select and enter the two asterisks for the subfunction value. The following table shows an example of a subfunction data display.

Function	Subfunction	Data Display
51	**	Subfunction mode entered
51	00, 01	NIA (8 bytes)
51	02, 03	Current TDE (8 bytes)

## Function 50 - System Processor Stop

This function stops the system processor.

**Attention:** This function may cause the system to end abnormally. Do not use unless you are directed by your support personnel.

### **Function 51 - System Processor Status**

This function displays the following values:

- NIA (next instruction address)
- Current TDE address

The data may be displayed 8 digits at a time. Select and enter a subfunction number to display each word of data from 00 to FF.

### **Function 52 - System Processor Start**

This function starts the system processor (after it has stopped).

### **Function 53 - Path Switch**

This function resets communications between the service processor and the operator panel.

---

## **Low-Level Debug (LLD) Panel Functions**

These functions are enabled when the system is stopped and Functions 25 and 26 are selected. These functions are used for analyzing IPL errors. The following is a list of all the low level debug (LLD) panel functions and a description of each.

### **Function 55 - Display Service Processor Log Buffer Type B**

The display service processor log buffer type B contains data related to the system terminating. The data may be displayed 8 digits at a time. Select and enter a subfunction number to display each word of data from 00 to FF.

### **Function 56 - Display Service Processor Code Area Type B**

The service processor code area type B contains the state of the system processor and service processor at the time of failure. This area contains data such as the failing LID (Load ID) which indicates what LID the service processor wanted from the load-source IOP. The data may be displayed 8 digits at a time. Select and enter a subfunction number to display each word of data from 00 to FF.

### **Function 58 - Display IPL Parameter Area**

The IPL parameters are contains the status of the type of IPL being performed. The data may be displayed 8 digits at a time. Select and enter a subfunction number to display each word of data from 00 to FF.

### | **Function 59**

| Sets the first character of the base address for function 62 display.

### | **Function 60**

| Sets the 2nd character of the base address for function 62 display.

### | **Function 61**

| Sets the last character of the base address for function 62 display.

| **Note:** The address in function 62 consists of 4 bytes. The address is of the form:

| ADDRESS 00 XX YY ZZ

| The address in function 59, 60, or 61 is changed by the following procedure.

- | 1. Press increment or decrement until the function number (59, 60, 61) is displayed
- | 2. Press Enter on the control panel; \*\* appears next to the function number.
- | 3. Press increment or decrement until the correct value appears.
- | 4. Press Enter.
- | 5. Press increment or decrement until \*\* appears next to the function number.
- | 6. Press Enter.

### | **Function 62 - Display Service Processor Control Storage**

| This displays the service processor control storage area data defined by addresses set by functions 59 thru 60.

### **Function 63 - System Status SRC Trace**

The system status SRC trace is a copy of the last 25 status SRCs (usually associated with the IPL sequence or the power-off sequence).

Enter a subfunction between hexadecimal 00 and 18 to look at the status SRCs in sequential order. The most recent SRC (the last status SRC) is viewed at subfunction hexadecimal 18.

### **Function 64 - Diagnostic Status SRC Trace**

The diagnostic status SRC trace is a copy of the last 25 status SRCs (usually associated with the service processor function of problem determination and main store dump).

Enter a subfunction between hexadecimal 00 and 18 to look at the status SRCs in sequence. The most recent SRC (the last status SRC) is seen at subfunction hexadecimal 18, and the extended SRC words for this SRC are seen at subfunction 19 through 20.



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## Update 8

This section contains updates made to:

- The to *S70 User's Guide*, "Appendix E. Service Processor Setup and Test."
- The to *S70 Installation and Service Guide*, "Appendix B. Service Processor Setup and Test."





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## 4. Service Processor Setup and Test

For your convenience, a sample Service Processor setup procedure is provided below. Your setup may include more or less of the available features, so you may wish to adjust this checklist for your own application.

### Service Processor Setup Checklist

1. Ensure the server is powered off.
2. Attach a local ASCII terminal for this setup procedure.
3. Attach a modem (if needed), see “How to access Service Processor menus locally” on page 173, and see “Modem Configuration Menu” on page 187 for the menus needed to configure your modem.
4. Power on the server, the local terminal, and the modem.
5. Bring up the SP Menus, see 5 on page 171.

**ATTENTION:** To bring up the SP Menus while the server is booting up, watch the operator panel display for checkpoint E04F. At this checkpoint, a ten second window of time begins with three beeps. Checkpoint E07A is displayed and is visible during the ten second window. During this window, strike any key on the local terminal and the SP menus appear on the local terminal.

6. Set the System Name, see “Privileged User Menus” on page 177.
7. Enable Surveillance, see 179.
8. Configure Call-In/Call-Out, see “Call-In/Call-Out Setup Menu” on page 186.
9. Exit the SP menus
10. Wait until the system offers a logon prompt. Log on and perform an orderly system shutdown using the AIX shutdown -F command.
11. Power off the server.
12. Test Call-In, page 166
13. Test Call-Out, page 167
14. Use the “Save or Restore Hardware Management Policies,” in the “Introduction to Tasks and Service Aids” section of the *Diagnostic Information for Multiple Bus Systems* to backup the service processor settings.

**Note:** This is strongly recommended to protect the usefulness of the service processor and the availability of the server.

Your Service Processor is ready to go to work.

---

## Testing the Service Processor Setup

These tests include communicating with the server's operating system. Be sure the necessary serial port(s) is configured. If you need assistance, refer to "Serial Port Configuration" on page 167.

Use following procedure to verify your Service Processor setup is working.

The server should still be powered off as a result of the setup checklist steps on page 165.

### Call-In

1. From any telephone, call the server's telephone number. After you hear three rings, hang up. The server powers on.  
**Note:** Although the server powers on during the three rings, you do not receive an indication over the telephone that the server is powering on.
2. Give the server five minutes to boot up and prepare to receive another call.
3. From an ASCII terminal or terminal emulator, call the server again. The server answers and presents the SP Menu on your terminal.
4. If required, enter your privileged access password. If no password is required, the Main Menu displays.
5. From the Main Menu, select `Continue System Boot` to view the IPL progress messages. Depending on your server's configuration, the boot up sequence may take several minutes. Once the boot up completes, the logon prompt displays. You have successfully called into the Service Processor and brought up the server.
6. Log in and then log out to disconnect from the operating system.
7. Call your server again. The operating system answers and offers the login prompt.  
  
If these tests are successful, call-in is working correctly. You must now shut down and power off the server. To do this, perform the following steps:
8. Login in and command your server to shutdown and power off. In AIX, use the shutdown `-F` command.

## Call-Out

| During the Service Processor setup, you entered **your** phone number for the Pager  
| (on page 191) and Customer Voice (on page 191) phone numbers. These entries  
| are used for this test.

1. Power on the server.
2. Bring up the SP Menus, see 5 on page 171.

| **ATTENTION:** To bring up the SP Menu while the server is booting up, watch  
| the operator panel display for checkpoint E04F. At this checkpoint, a ten second  
| window of time begins with three beeps. Checkpoint E07A is displayed and is  
| visible during the ten second window. During this window, strike any key on the  
| local terminal and the SP menus appear on the local terminal.

3. At the **Service Processor Main Menu**, select Call-In/Call-Out Setup menu, then select Call-Out test. This causes a simulated error condition for the purposes of this test.
4. When your telephone rings, answer the call. You should hear the sound of a telephone being dialed. This is your system unit trying to page you.

If this test is successful, call-out is working.

| You should now select "Telephone Number Setup Menu" on page 190 to enter the  
| **actual** telephone numbers your server uses to report problems.

## Serial Port Configuration

To configure the serial port on an AIX system, enter the following commands from an AIX console:

1. Log in as root.
2. To find if you have any serial ports already configured, enter:

```
lsdev -Cc tty
```

If no serial ports are configured, none are listed. If you wish to configure serial ports that are not listed, continue with the remaining steps.

3. Identify the serial port(s) with the modem(s).
4. Enter  

```
smit tty
```
5. Select add tty
6. Select RS232

7. Select Baud rate 9600 or higher.
8. Select login enable and set the flow control to RTS.
9. Commit the selections and set up any other needed serial ports.
10. Exit SMIT.

---

## Programming System Vital Product Data

Some software uses the System Vital Product Data (VPD) when operating to identify the type and model of system it is operating on. This procedure provides a method of programming the VPD on the S70.

**Attention:** The Service Processor (SP) allows programming of the System VPD only once. Take care to enter the fields correctly. The following procedure takes you through the steps of programming the system VPD.

1. To access the SP, connect a local ASCII terminal to either serial port 1 or serial port 2 of the host server.
2. Power-On the system. When the operator panel "beeps" and displays E07A, strike the Enter key on the local terminal.
3. Type 37222 to access the hidden menu function for programming System VPD. If VPD is already programmed, SP will print "illegal value entered" on the terminal.
4. Type "A," SP will prompt you to enter 7 ASCII characters for the VPD Serial Number [SE]. Enter the system serial number (example: 0YE6129). SP will confirm that the serial number has been successfully programmed.
5. SP will prompt you to enter 8 ASCII characters for the Type and Model [TM] data field (example: 7017-S70).
6. SP will confirm that the TM field has been successfully programmed.
7. SP will prompt you to press Return (Enter) to continue, which brings you back to the SP Main Menu.
8. Select System Power Control Menu.
9. Select Power-Off System.
10. When the system has been off for about one minute, power the system on by pressing the white button on the operator panel.

---

## Update 9

This section contains updates made to:

- The *S70 User's Guide*, "Chapter 3. Service Processor Menus."
- The *S70 Installation and Service Guide*, "Appendix C. Service Processor Menus."



---

## **5. Service Processor Menus**

The Service Processor (Service Processor) menus make it possible for you to configure Service Processor options, as well as enable and disable functions.

Service Processor (SP) menus are available using an ASCII terminal while the system is powering on or when the Service Processor has detected a server problem (such as a surveillance failure).

For a summary of the Service Processor functions and the methods used to invoke them, see Table 9 on page 172.

*Table 9. Service Processor Functions*

<b>SP Functions</b>	<b>SP Menus (ASCII terminals)</b>	<b>SP Service Aids (ASCII or graphics terminals)</b>	<b>SMS (ASCII or graphics terminals)</b>
Read VPD image from last system boot	Y <sup>3</sup>		
Read System POST Errors	Y <sup>3</sup>		
Read SP Error Logs	Y <sup>3</sup>		
View Progress Indicators from last Boot	Y <sup>3</sup>		
Power-off System	Y <sup>2</sup>		
Read NVRAM	Y <sup>2</sup>		
Start Talk Mode	Y <sup>2</sup>		
Enable/Disable Console Mirroring	Y <sup>2</sup>		
Setup Reboot/Restart Policy	Y <sup>2</sup>	Y <sup>1</sup>	
Enable/Disable Modem	Y <sup>2</sup>	Y <sup>1</sup>	
Setup Modem Configuration	Y <sup>2</sup>	Y <sup>1</sup>	
Setup Dial-out Phone Numbers	Y <sup>2</sup>	Y <sup>1</sup>	
Setup Surveillance	Y <sup>2</sup>	Y <sup>1</sup>	
Select Modem Line Speed	Y <sup>2</sup>	Y <sup>1</sup>	
Update SP Flash EPROM		Y <sup>1</sup>	
Save/Restore Hardware Maintenance Policies		Y <sup>1</sup>	
Change General Access Password	Y <sup>2</sup>		
Change Privileged Access Password	Y <sup>2</sup>		Y <sup>2</sup>
Select Language	Y <sup>2</sup>		Y <sup>2</sup>
Enable/Disable Unattended Start Mode	Y <sup>2</sup>	Y <sup>1</sup>	Y <sup>2</sup>

Passwords required (if set):

- <sup>1</sup> Operating system root password
- <sup>2</sup> Privileged access password
- <sup>3</sup> General access (power-on) password



---

## Service Processor Menus

The Service Processor (Service Processor) menus are divided into two groups:

- General user menus - the user must know the general access password.
- Privileged user menus - the user must know the privileged access password.

The following section describes these two groups of menus, how to access them, and the functions associated with each option.

If the server is powered on, the Service Processor menus may be accessed locally or remotely as described below.

### How to access Service Processor menus locally

Service Processor menus may be accessed locally by connecting an ASCII terminal to either serial port 1 or 2. Because the presence of the ASCII terminal cannot be confirmed by the Service Processor, you must press a key (any key) on the ASCII terminal to confirm its presence. The key on the ASCII terminal must be pressed during the time when the operator panel display shows the code E07A.

You can recognize when the Service Processor menu access time begins in the following ways:

- The checkpoint prior to the access checkpoint is E043.
- The system beeps three times as it enters checkpoint E07A.

When you gain access, the Service Processor prompts you for a password (if set), and when verified, displays the Service Processor menus.

### How to access Service Processor menus remotely

If your system has a modem connected and configured for call-in (see "Modem Configuration Menu" on page 187), Service Processor menus can be accessed remotely as follows:

1. With the system powered off, call in from a remote terminal. Wait for at least two rings and hang up. The system powers on upon detecting ring-indicate, and pauses for a return call if call-in is enabled.
2. Wait five minutes and call-in again. The Service Processor prompts you for a password (if set). When verified, the Service Processor menus display remotely.

## **Saving and Restoring Service Processor Settings**

All the settings you make (except language) from the service processor menus can be backed up either for recovering from a fault that may corrupt these settings, or for replicating these settings to other servers that include a service processor.

The service aid, Save or Restore Hardware Management Policies, can be used to save your settings after initial setup or whenever the settings must be changed for system operation purposes.

It is strongly recommended that this service aid is used for backing up service processor settings to protect the usefulness of the service processor, and the availability of the server. Refer to "Save or Restore Hardware Management Policies," in the "Introduction to Tasks and Service Aids" section of the *Diagnostic Information for Multiple Bus Systems*.

## **How to return to Service Processor Menus**

When exiting Service Processor menus using option "99", there is a 10 second delay before the system continues its boot procedure. During that 10 seconds, you may strike a key on the ASCII terminal to return to the menus and select other options.

During the 10 second delay, an information message appears on the display. After the 10 second delay, Service Processor menus are no longer available until either the next system boot or the Service Processor regains control due to a system failure.

## **Menu Inactivity**

To prevent loss of control due to power loss or power surges, Service Processor attempts to leave menu mode after 10 minutes of inactivity by simulating the option 99 selection. This attempt is successful on menus containing the "99" option. On the other menus, the attempt is unsuccessful and the following message displays with each attempt:

```
Illegal value entered  
Press Return to continue
```

If for some reason you want to hold the server in menu mode, select one of the menus that do not have the "99" option. Boot activity cannot continue if Service Processor is in menu mode, and power losses or surges could result in unpredictable server responses.

---

## General User Menus

The menu options presented to the General user are a subset of the options available to the Privileged user. The user must know the General Access Password, if set, in order to access these menus.

```
GENERAL USER MENU
1. Continue System Boot
2. Read VPD Image from Last System Boot
3. Read Progress Indicators from Last System Boot
4. Read Service Processor Error Logs
5. Read System POST Errors
99. Exit from Menus
```

- **Continue System Boot**

Allows the user to continue with and monitor the system boot already in progress using the current ASCII terminal as the active console.

Make this selection if you wish to monitor the IPL progress messages on your terminal. If you do not wish to monitor the IPL progress messages, select option **99. Exit from Menus**.

- **Read VPD Image from Last System Boot**

Displays manufacturer vital product data, such as serial numbers, part numbers, etc., that were stored from the system boot prior to the one in progress now.

- **Read Progress Indicators from Last System Boot**

Displays the boot progress indicators (check points), up to a maximum of 100, from the system boot prior to the one in progress now. This historical information may be useful to help diagnose system faults.

The progress indicators are displayed in two sections. Above the dashed line are the progress indicators from the boot that produced the current sessions. Below the dashed line are progress indicators from the boot preceding the one that produced the current sessions.

The progress indication codes are chronological from bottom to top. The dashed line merely represents the point where the latest boot started. For an example, refer to “LCD Progress Indicator Log” on page 208.

- **Read Service Processor Error Logs**

Displays the Service Processor error logs. For an example, refer to “Service Processor Error Logs” on page 207.

- **Read System POST Errors**

Displays the results of the System Firmware POST (Power-On Self Test). Your server may be able to start in the presence of POST errors if there is sufficient working system resources. If POST errors occur during start-up, this error log when used with the diagnostics helps to isolate faults. For an example, refer to “Service Processor Error Logs” on page 207.

- **Exit from Menus**

| Allows the user to continue with the system boot already in progress using the  
| current ASCII terminal as the active console. Make this selection if you **do not**  
| wish to monitor the IPL progress messages on your terminal. Exiting from the  
| menus causes the modems to disconnect, but the boot process continues.

---

## Privileged User Menus

The following menus are available to privileged users only. The user must know the Privileged Access Password, if set, to access these menus.

### Main Menu

At the top of the MAIN Menu is a listing containing:

- Your Service Processor's current firmware version
- The firmware copyright notice
- The System Name given to your server during setup

You need the firmware version for reference when you either update or repair the functions of your service processor.

The System Name, an optional field, is the name your server reports in problem messages. This name helps your support team, (for example, your system administrator, network administrator, or service representative) to more quickly identify the location, configuration, and history of your server. The System Name is set from the Main Menu using option 6.

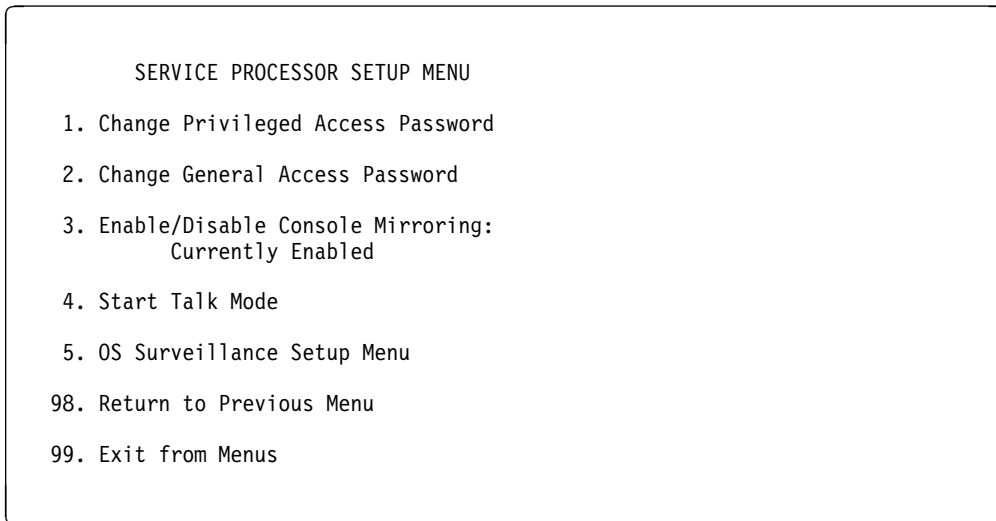
**Note:** The information under the Service Processor Firmware heading in the Main Menu illustration that follows is example information only.

```
Service Processor Firmware
VERSION: 19970814
Copyright 1997, IBM Corporation
SYSTEM NAME
```

MAIN MENU

1. Service Processor Setup Menu
2. System Power Control Menu
3. System Information Menu
4. Language Selection Menu
5. Call-In/Call-Out Setup Menu
6. Set System Name
99. Exit from Menus

## Service Processor Setup Menu



**Note:** Unless otherwise stated in menu responses, settings become effective when a menu is exited using option 98 or 99.

## Passwords

Passwords can be any combination of up to 8 alphanumeric characters. You can enter longer passwords, but the entries are truncated to include only the first 8 characters. Privileged Access Password can be set from SP menus or from System Management Services (SMS) utilities. General Access Password can be set only from SP menus.

For security purposes, SP counts the number of attempts to enter correct passwords. The results of not recognizing a correct password within this error threshold are different, depending on whether the attempts are being made locally (at the server) or remotely (via a modem). The error threshold is 3.

If the error threshold is reached by someone entering passwords at the server, SP commands IPL to resume. This action is taken based on the assumption that the server is in an adequately secure location with only authorized users having access. Such users must still successfully enter a login password to access AIX.

If the error threshold is reached by someone entering passwords remotely, SP commands the server to power down to prevent potential security attacks on the server by unauthorized remote users. The following illustrates what you can access with the Privileged Access Password and the General Access Password.

Privileged Access Password	General Access Password	Resulting Menu
None	None	Service Processor MAIN MENU displayed
None	Set	Users with the password see the GENERAL USER MENU. Users without the password see Service Processor MAIN MENU.
Set	None	Users with the password see the Service Processor MAIN MENU. Users without password see the GENERAL USER MENU.
Set	Set	Users see menus associated with the entered password

**Note:** If you *forget* the password, you must remove the battery for at least 30 seconds to disable the password. See “Operator Panel Battery” on page 9-15 of the *RS/6000 Enterprise Server S70 Installation and Service Guide* for details.

- **Change Privileged Access Password**

Set or change the Privileged Access Password. It provides the user with the capability to access all Service Processor functions. This password is usually used by the system administrator or **root** user.



- **Change General Access Password**

Set or change the General Access Password. It provides limited access to Service Processor menus, and is usually available to all users who are allowed to power-on the server, especially remotely.

**Note:** The General Access Password can only be set or changed while the Privileged Access Password is set.

- **Enable/Disable Console Mirroring**

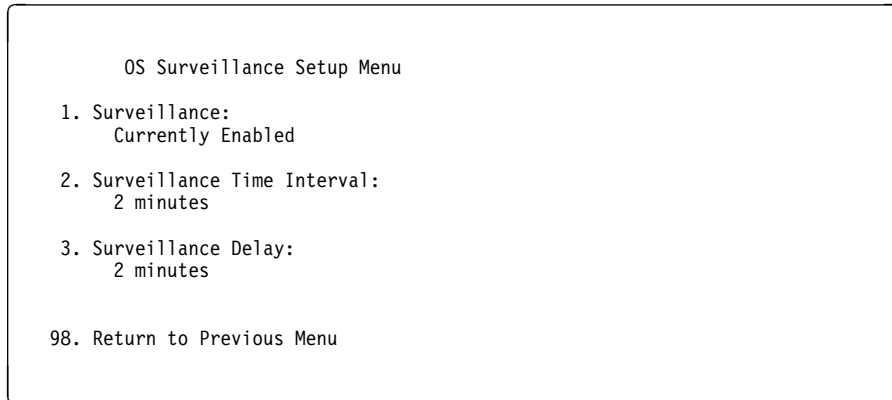
When Console Mirroring is enabled, the Service Processor sends information to both serial ports. This capability may be enabled by local or remote users. This provides local users the capability to monitor remote sessions. Console mirroring may be enabled for the current session only. For more information, see “Console Mirroring” on page 206.

- **Start Talk Mode**

In a console mirroring session, it is useful for those that are monitoring the session to be able to communicate with each other. Selecting this menu item activates the keyboards and displays for such communications while console mirroring is established. This is a full duplex link, so message interference is possible. Alternating messages between users works best.

- **OS Surveillance Setup Menu**

This option may be used to setup operating system (OS) surveillance.



- **Surveillance**

May be set to Enabled or Disabled.

- **Surveillance Time Interval:**

May be set to any number from 2 through 255.

- **Surveillance Delay:**

May be set to any number from 0 through 255.

Refer to “Service Processor System Monitoring - Surveillance” on page 203 for more information about surveillance.

## System Power Control Menu

```
SYSTEM POWER CONTROL MENU

1. Enable/Disable Unattended Start Mode:
   Currently Enabled

2. Reboot/Restart Policy Setup Menu

3. Continue System Boot

4. Power-Off System

98. Return to Previous Menu

99. Exit from Menus
```

- **Enable/Disable Unattended Start Mode**

This option may be used to instruct Service Processor to restore the power-state of the server after a temporary power failure. Unattended Start Mode can also be set via SMS Menus. It is intended to be used on servers that require automatic power-on after a power failure. For more information, see “System Power-On Methods” on page 198.

- **Reboot/Restart Policy Setup Menu**

See “Reboot/Restart Policy Setup Menu” on page 194.

- **Continue System Boot**

Allows the user to continue with and monitor the system boot already in progress using the current ASCII terminal as the active console.

Make this selection if you wish to monitor the IPL progress messages on your terminal. If you do not wish to monitor the IPL progress messages, select option **99. Exit from Menus**.

- **Power-off System**

Allows the user to power-off the server.

## System Information Menu

### SYSTEM INFORMATION MENU

1. Read VPD Image from Last System Boot
2. Read Progress Indicators from Last System Boot
3. Read Service Processor Error Logs
4. Read System POST Errors
5. Read NVRAM
98. Return to Previous Menu
99. Exit from Menus

- **Read VPD Image from Last System Boot**

Displays manufacturer's vital product data (VPD), such as serial numbers, part numbers, etc., that was stored from the system boot prior to the one in progress now.

- **Read Progress Indicators from Last System Boot**

Displays the boot progress indicators (check points), up to a maximum of 100, from the system boot prior to the one in progress now. This historical information may be useful to help diagnose system faults.

The progress indicators are displayed in two sections. Above the dashed line are the progress indicators from the boot that produced the current sessions. Below the dashed line are progress indicators from the boot preceding the one that produced the current sessions.

The progress indication codes are chronological from bottom to top. The dashed line merely represents the point where the latest boot started. For an example, refer to "LCD Progress Indicator Log" on page 208.

- **Read Service Processor Error Logs**

Displays error conditions detected by the Service Processor. Refer to "Service Processor Error Logs" on page 207 for an example of this error log.

- **Read System POST Errors**

Selecting this item lets you review the results of the POST (Power-On Self Test). Your server may be able to start in the presence of POST errors if there are sufficient working system resources. If POST errors occur during start-up, this error log when used with the diagnostics helps to isolate faults. Refer to “System POST Errors” on page 207 for an example of this error log.

- **Read NVRAM**

Displays Non-Volatile Random Access Memory (NVRAM) content.

## Language Selection Menu

```
LANGUAGE SELECTION MENU

1. English
2. Francais
3. Deutsch
4. Italiano
5. Espanol
6. Svenska
98. Return to Previous Menu
99. Exit from Menus
```

**Note:** Your ASCII terminal must support the ISO-8859 character set in order to properly display languages other than English.

This menu allows selecting languages in which Service Processor and system firmware menus and messages are displayed.

## Call-In/Call-Out Setup Menu

### CALL-IN/CALL-OUT SETUP MENU

1. Modem Configuration Menu
2. Serial Port Selection Menu
3. Serial Port Speed Setup Menu
4. Telephone Number Setup Menu
5. Call-Out Policy Setup Menu
6. Customer Account Setup Menu
7. Call-Out Test
98. Return to Previous Menu
99. Exit from Menus

- **Modem Configuration Menu**, see “Modem Configuration Menu” on page 187.
- **Serial Port Selection Menu**, see “Serial Port Selection Menu” on page 188.
- **Serial Port Speed Setup Menu**, see “Serial Port Speed Setup Menu” on page 189.
- **Telephone Number Setup Menu**, see “Telephone Number Setup Menu” on page 190.
- **Call-Out Policy Setup Menu**, see “Call-Out Policy Setup Menu” on page 192.
- **Customer Account Setup Menu**, see “Customer Account Setup Menu” on page 193.

## Modem Configuration Menu

The first two lines of the Modem Configuration Menu are status lines showing the current selections. Selections are made in the two sections labeled Modem Ports and Modem Configuration File Name. Select the serial port that you want to activate and then select the modem configuration file for the modem on the port. If you want to set up both serial ports with modems, make your selections one port at a time.

For information on choosing a modem configuration file, see “Sample Modem Configuration Files” on page 223 and “Seamless Transfer of a Modem Session” on page 229.

```
Modem Configuration Menu

Port 1 Modem Configuration File Name:
Port 2 Modem Configuration File Name:  modem_m0_sp

To make changes, First select the port and then the configuration file name

Modem Ports:
  1. Serial port 1
  2. Serial port 2

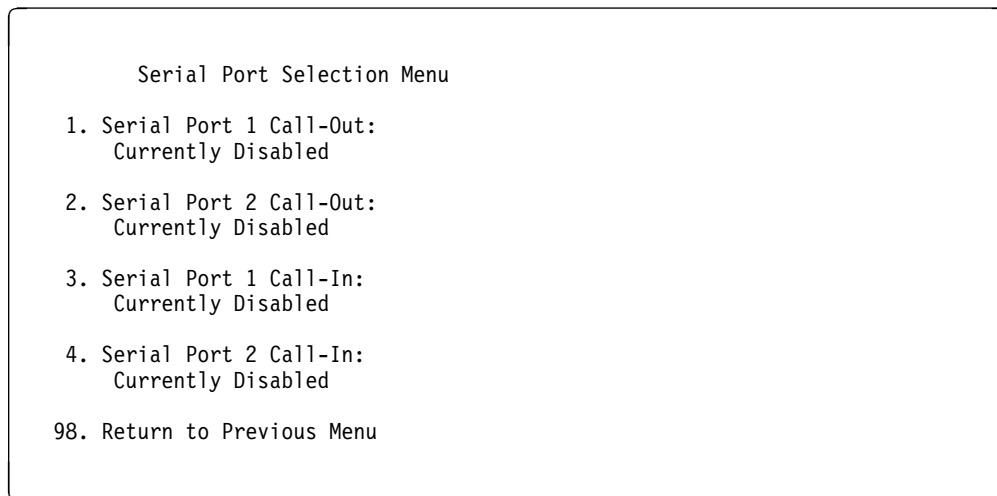
Modem Configuration File Name:
  3. none
  4. modem_f_sp           9. modem_m0_sp
  5. modem_f0_sp          10. modem_m1_sp
  6. modem_f1_sp
  7. modem_z_sp
  8. modem_z0_sp

 30. Save configuration to NVRAM and Configure modem
 98. Return to Previous Menu

>
```

For information on choosing a modem configuration file, see “Sample Modem Configuration Files” on page 223, and “Seamless Transfer of a Modem Session” on page 229.

## Serial Port Selection Menu



You may enable and/or disable the call-in and call-out functions of each serial port in any combination.

**Note:** For security, if the service processor detects an operator panel battery failure, the Serial Port Dial-In capability becomes disabled. See “Service Processor Call-In Security” on page 199 for more information.



## Serial Port Speed Setup Menu

Serial Port Speed Setup Menu

1. Serial Port 1 Speed:  
Currently 9600
2. Serial Port 2 Speed:  
Currently 9600
98. Return to Previous Menu

Serial port speed can be set for terminal performance or to accommodate modem capabilities. A speed of 9600 baud or higher is recommended. Valid serial port speeds are shown below:

50	600	4800
75	1200	7200
110	1800	9600
134	2000	19200
150	2400	38000
300	3600	57600
		115200

## Telephone Number Setup Menu

This menu may be used to set or change the telephone numbers for reporting a system failure. Service Processor allows setting or changing telephone numbers for:

- **Service Center Telephone Number** - The telephone number of the maintenance provider's computer.
- **Customer Administration Center Telephone Number** - The telephone number of the local system support provider's computer.
- **Digital Pager Telephone Number** - The telephone number of the digital pager used by the person responsible for problem calls.
- **Customer Voice Telephone Number** - The telephone number service personnel use to reach the system user.
- **Customer System Telephone Number** - The telephone number to which the server's modem is connected.

### Telephone Number Setup Menu

1. Service Center Telephone Number:  
Currently Unassigned
2. Customer Administration Center Telephone Number:  
Currently Unassigned
3. Digital Pager Telephone Number:  
Currently Unassigned
4. Customer Voice Telephone Number:  
Currently Unassigned
5. Customer System Telephone Number:  
Currently Unassigned
98. Return to Previous Menu

- **Service Center Telephone Number** is the number of the service center computer. The service center usually includes a computer that takes calls from servers with call-out capability. This computer is referred to as "the catcher." The catcher expects messages in a specific format to which Service Processor conforms. For more information about the format and catcher computers, refer to the README file in the AIX `/usr/samples/syscatch` directory. Contact your service provider for the correct telephone number to enter here. Until you have that number, leave this field unassigned.
- **Customer Administration Center Telephone Number** is the number of the System Administration Center computer (catcher) that receives problem calls from servers. Contact your system administrator for the correct telephone number to enter here. Until you have that number, leave this field unassigned.
- **Digital Pager Telephone Number** is the number for a numeric pager carried by someone who responds to problem calls from your server. Contact your administration center representative for the correct telephone number to enter here. For test purposes, enter your telephone number here. You can change it later when testing is complete. See note on page 205.
- **Customer Voice Telephone Number** is the telephone number of a phone near the server or answered by someone responsible for the server. This is the telephone number left on the pager for callback. For test purposes, enter your telephone number here. You can change it after testing is completed.
- **Customer System Telephone Number** is the telephone number to which your server's modem is connected. The service or administration center representatives need this number to make direct contact with your server for problem investigation. This is also referred to as the **call-in** phone number.

## Call-Out Policy Setup Menu

```
CALL-OUT POLICY SETUP MENU

1. Call-Out policy (First/All):
   Currently First

2. Remote timeout, (in seconds):
   Currently 120

3. Remote latency, (in seconds):
   Currently 2

4. Number of retries:
   Currently 2

98. Return to Previous Menu
```

- **Call-Out policy** may be set to 'first' or 'all'. If call-out policy is set to 'first', the Service Processor stops at the **first successful** call-out to one of the following numbers in the order listed:

1. Service Center
2. Customer Admin Center
3. Pager

If call-out policy is set to 'all', the Service Processor attempts a call-out to **all** the following numbers in the order listed:

1. Service Center
2. Customer Admin Center
3. Pager

**Remote timeout** and **Remote latency** are functions of your service provider's catcher computer. You should take the defaults or contact your service provider for recommended settings.

| **Number of retries** is the number of times you want the server to retry calls that  
| failed to complete.

## Customer Account Setup Menu

Customer Account Setup Menu

1. Customer Account Number:  
Currently Unassigned
2. Customer RETAIN Login userid:  
Currently Unassigned
3. Customer RETAIN login password:  
Currently Unassigned
98. Return to Previous Menu

- **Customer Account Number** is assigned by your service provider for record keeping and billing. If you have an account number, enter it here. Otherwise, leave this field unassigned.
- **Customer RETAIN Login UserID** and **Customer RETAIN Login Password** apply to a service function to which your service provider may or may not have access. Leave these fields unassigned if your service provider does not use RETAIN.

## Reboot/Restart Policy Setup Menu

Reboot/Restart Policy Setup Menu

1. Number of reboot attempts:  
Currently 3
2. Use OS-Defined restart policy?  
Currently Yes
3. Enable supplemental restart policy?  
Currently No
4. Call-Out before restart:  
Currently Disabled

98. Return to Previous Menu

**Reboot** is the process of bringing up the system hardware. For example, from a system reset or power on. **Restart** is activating the operating system after the system hardware is re-initialized. Restart must follow a successful reboot.

- **Number of reboot attempts** - If the server fails to successfully complete the boot process, it attempts to reboot the number of times specified. Entry values equal to or greater than 0 are valid. Only successive failed reboot attempts count, not reboots that occur after a restart attempt. At restart, the counter is set to 0.
- **Use OS-Defined restart policy** - Allows the Service Processor react or not react the same way as the operating system to major system faults by reading the setting of the operating system parameter **Automatically Restart/Reboot After a System Crash**. This parameter may or may not be defined depending on the operating system or its version/level. If the operating system automatic restart setting is defined, then it may be set to respond to a major fault by restarting or by not restarting. See your operating system documentation for details on setting up operating systems automatic restarts. The default value is YES.

- **Enable supplemental restart policy** - The default setting is NO. If set to YES, the Service Processor restarts the system when the system loses control as detected by Service Processor surveillance, and either:
  1. The **Use OS-Defined restart policy** is set to NOOR
  2. The **Use OS-Defined restart policy** is set to YES and the operating system has NO automatic restart policy.Refer to “Service Processor Reboot/Restart Recovery” on page 200.
- **Call-Out before restart (Enabled/Disabled)** If a restart is necessary due to a system fault, you can enable the Service Processor to call out and report the event. This item is valuable if the number of these events becomes excessive, signalling a bigger problem.

## Service Processor Functions

The following section discusses some of the Service Processor (Service Processor) features in greater detail.

The S70 Service Processor supports the following functions:

Built-in Functions	Initialization and Test	Service Processor Basic Instructions Test (BIST)
		System Chip Initialization
	Error Data Collection	BIST/POST errors and status
		Isolation to Field Replaceable Unit (FRU) on fail.
	Configuration	CPU Complex validation
		VPD Collection
	System Management	Reset and Reboot on System Firmware fails
		Reboot on system failure
Local User Function	User Interface	Local async console
		Text based menus with NLS
		Operator Panel messages
	Power and Miscellaneous	Power On/Off
		Configurable Reboot Policy
	Status and Data Access	VPD
		Error data (SP)
		Error data (system)
	SP Setup Utilities	Passwords
		Phone numbers
		Language (NLS) selection
		Call-In/Call-Out enable/disable
		System Name
	Modem Configuration	



Remote User Functions	Call-Out (Call Home) Reporting	OS termination
		Boot failure
		Surveillance failure
		Checkstop
		Machine check
		Identify system by name
	Call-In	Power-on via ring-indicate
		Password/security check
		Console mirroring

---

## System Power-On Methods

- Power-on Switch - see "Powering On the System" on page 9-5 of the *RS/6000 Enterprise Server S70 Installation and Service Guide*.

- Remote Power-on via Ring-Indicate Signal

The server automatically powers on when it detects a "ring indicate" signal from a modem attached to one of the integrated serial ports.

A remote user can call the server to activate ring detection by the modem. Listen for a few more rings than the threshold number for starting the system and then hang up. The default threshold is one ring.

Wait 5 minutes for the server to initialize and then call again using an ASCII terminal. The server responds by requesting a password, if set, or presenting the Service Processor menus. The remote user now has control of the server.

**Note:** For security, if the system is powered on by the remote power-on via ring indicate signal and the service processor detects an operator panel battery failure, the service processor causes the system to power off. See "Service Processor Call-In Security" on page 199 for more information.

- Unattended start mode - refer to **Enable/Disable Unattended Start Mode** on page 183.

The SP can be enabled to recover from the loss of AC power (see Enable/Disable Unattended Power-On Mode in the SYSTEM POWER CONTROL MENU). When AC power is restored, the system returns to the then current power state at the time AC loss occurred. For example, if the system was powered-on when AC loss occurred, it reboots/restarts when power is restored. If the system was powered-off when AC loss occurred, it remains off when power is restored.

It is recommended that the system rack and I/O rack both receive their AC power from the same building circuit on the same circuit breaker, if not the same electrical outlet box, in such a way that primary power cannot be lost to one rack separately from the other. If such a condition occurs, Unattended Start Mode may not be able to restart system operation when a primary power interruption is restored.

- Timed power-on - refer to the shutdown -t command on servers using AIX.

Working in conjunction with AIX, the Service Processor in your server can operate a timer, much like the wake-up timer on your clock radio. You can set the timer so that your server powers on at a certain time after shutting down. The timer is battery operated, so power interruptions occurring while the server is off do not affect its accuracy. Refer to the shutdown -t command of AIX for details on setting the timer.

**Note:** If an AC power loss is in progress when the Timed Power-On attempt occurs, the server is not be able to power on when AC power is restored.

- Follow-up to a Failed Boot Attempt

The Service Processor initiates a power-on sequence upon detection of a failed boot attempt (due to a hardware or software failure).

- Fast/Slow Boot (IPL) Capabilities

Using the operator panel functions, you can select the IPL type, mode and speed of your boot capabilities. For more information, refer to operator panel functions 01 and 02 in "Operator Panel Function Descriptions" on page 150.

**ATTENTION:** Selecting fast IPL results in several diagnostic tests being skipped.

---

## Service Processor Call-In Security

If the service processor detects bad battery-powered storage (indicating that the battery in the Operator Panel has failed or is disconnected), it maintains server security by disabling the call-in capability to both serial ports.

When call-in is disabled, the system can still be powered on by using the ring-indicator signal, but the service processor then causes the system to power down, preventing access to any system facilities or AIX.

Once battery power is restored, the password(s) must be reset and the call-in function(s) enabled. Both of these operations can be performed from SP menus. See "Service Processor Setup Menu" on page 179 and "Serial Port Selection Menu" on page 188.

---

## Service Processor Reboot/Restart Recovery

**Reboot** describes bringing the system hardware back up. For example, from a system reset or power on. The boot process ends when control passes to the operating system process.

**Restart** describes activating the operating system after the system hardware is reinitialized. Restart must follow a successful reboot.

### Boot (IPL) Speed

When the server enters reboot recovery, slow IPL is automatically invoked. This is to give the POST an opportunity to locate and report any problems that may otherwise be untested. For more information on IPL speed, refer to “Values for IPL Types and Speeds” on page 150.

### Failure During Boot Process

During the boot process, either initially after system power-on or upon reboot after a system failure, the Service Processor (SP) monitors the boot progress. If progress stops, the SP can reinitiate the boot process (reboot) if enabled to do so. SP can re-attempt this process according to the number of retries selected in the Reboot/Restart Policy Setup Menu.

### Failure During Normal System Operation

When the boot process completes and control transfers to the operating system (OS), the SP can monitor operating system activity (see the SERVICE PROCESSOR SETUP MENU item Set Surveillance Parameters). If OS activity stops due to a hardware or software induced failure, the SP can initiate a reboot/restart process based on the settings in the SP Reboot/Restart Policy Setup Menu and the OS automatic restart settings (see OS documentation).

If the operating system is AIX, the menu item under SMIT for setting the restart policy is Automatically Reboot After Crash (True/False), and the default is False. When the setting is True, and if the SP parameter "Use OS-Defined Restart Policy" is Yes (the default), SP takes over for AIX to reboot/restart after a hardware or Surveillance failure.

## Service Processor Reboot/Restart Policy Controls

The operating system's automatic restart policy (see operating system documentation) indicates the OS response to a system crash. The SP can be instructed to refer to that policy, or not, by the Use OS-Defined Restart Policy menu item.

If the operating system has no automatic restart policy, or if it is disabled, then the SP restart policy can be controlled from the SP Menus by using the Enable Supplemental Restart Policy selection.

**Use OS-Defined restart policy** - The default setting is YES. This causes the SP to refer to the OS Automatic Restart Policy setting and take action; the same action the OS would take if it could have responded to the problem causing the restart.

When this setting is NO, or if the OS did not set a policy, the SP refers to Enable supplemental restart policy for its action.

**Enable supplemental restart policy** - The default setting is NO. If set to YES, the Service Processor restarts the server when the OS loses control and either:

1. The **Use OS-Defined restart policy** is set to NO
- OR
2. The **Use OS-Defined restart policy** is set to YES and the operating system has NO automatic restart policy.

Refer to "Service Processor Reboot/Restart Recovery" on page 200.

The following provides a more thorough understanding of the relations among the OS and SP restart controls:

<b>OS Automatic reboot/restart after crash setting</b>	<b>SP to use OS-Defined restart policy?</b>	<b>SP Enable supplemental restart policy?</b>	<b>System response</b>
None	No	No <sup>1</sup>	
None	No	Yes	Restarts
None	Yes <sup>1</sup>	No <sup>1</sup>	
None	Yes <sup>1</sup>	Yes	Restarts
False <sup>2</sup>	No	No <sup>1</sup>	
False <sup>2</sup>	No	Yes	Restarts
False <sup>2</sup>	Yes <sup>1</sup>	No <sup>1</sup>	
False <sup>2</sup>	Yes <sup>1</sup>	Yes	
True	No	No <sup>1</sup>	
True	No	Yes	Restarts
True	Yes <sup>1</sup>	No <sup>1</sup>	Restarts
True	Yes <sup>1</sup>	Yes	Restarts

<sup>1</sup> SP default

<sup>2</sup> AIX default

---

## **Service Processor System Monitoring - Surveillance**

Surveillance is a function in which the Service Processor (Service Processor) monitors the system, and the system monitors the Service Processor. This monitoring is accomplished by periodic samplings called heartbeats.

Surveillance is available during two phases:

1. System firmware bringup (automatic) and
2. Operating system runtime (optional).

### **System Firmware Surveillance**

Provides the Service Processor with a means to detect boot failures while the system firmware is running.

System firmware surveillance is automatically enabled during system power-on. It cannot be disabled via a user selectable option.

If the Service Processor detects no heartbeats during system IPL (for 7 minutes), it cycles the system power to attempt a reboot. The maximum number of retries is set from the Service Processor menus. If the fail condition persists, the Service Processor leaves the machine powered on, logs an error and offers menus to the user. If Call-out is enabled, the Service Processor calls to report the failure and displays the operating system surveillance failure code on the operator panel.

### **Operating System Surveillance**

Provides the Service Processor with a means to detect hang conditions, hardware or software failures while the operating system is running. It also provides the operating system with a means to detect Service Processor failure by the lack of a return heartbeat.

Operating system surveillance is not enabled by default. This is to allow the user to run operating systems that do not support this Service Processor option.

Operating system surveillance can be enabled and disabled via:

- Service Processor Menus
- Service Processor Service Aids

Three parameters must be set for operating system surveillance:

1. Surveillance enable/disable
2. Surveillance interval

This is the maximum time Service Processor should wait for a heartbeat from the operating system before timeout.

3. Surveillance delay

This is the length of time to wait from when the operating system is started to when the first heartbeat is expected.

Surveillance does not take effect until the next time the operating system is started after setting the parameters.

If operating system surveillance is enabled (and system firmware has passed control to the operating system), and Service Processor does not detect any heartbeats from the operating system, the Service Processor assumes the system is hung and takes action according to the reboot/restart policy settings. See “Service Processor Reboot/Restart Recovery” on page 200.



---

## Call-Out (Call-Home)

The Service Processor can call-out (Call-Home) when it detects one of the following conditions:

- System firmware surveillance failure
- Operating system surveillance failure (if supported by Operating System)
- Restarts
- Critical hardware failure
- Abnormal OS termination

To enable the call-out feature, you need to do the following:

- Have a modem connected to serial port 1 or 2.
- Set up the following using the SP Menus or Diagnostic Service Aids:
  - Enable call-out for the serial port where the modem is connected.
  - Enter the modem configuration filename.
  - Set up site specific parameters (i.e. phone numbers for call-out, call-out policy, number of call-out retries, etc.).
- To Call-Out before restart, set "**call-out before restart**" to ENABLED from the Reboot/Restart Policy Setup menu.

**Note:** Some modems, such as IBM 7857-017, are not designed for the paging function. Although they can be used for paging, they will return an error message when they do not get the expected response from another modem. Therefore, even though the paging was successful, the error message will cause the Service Processor to retry, continuing to place pager calls for the number of retries specified in the Call-Out Policy Setup Menu. These retries result in redundant pages.

---

## Console Mirroring

Console mirroring allows a person on a local ASCII terminal to monitor the Service Processor activities of a remote user. Console mirroring ends when Service Processor releases control of the serial ports to the system firmware.

### System Configuration:

- Service Processor
- Modem connected to one serial port and enabled for incoming calls
- Local ASCII terminal connected to the other serial port. This local terminal may be connected directly to your server or connected through another modem.

There are two scenarios in which console mirroring can be invoked:

1. Remote session first, then local session added:
  - a. Remote session already in progress.
  - b. Remote user uses Service Processor menus to enable console mirroring, allowing both consoles to be active.
2. Local session first, then remote session added:
  - a. Local session is already in progress.
  - b. The Service Processor receives a call from the remote user.
  - c. The local user selects the option to enable console mirroring. Service Processor immediately begins mirroring Service Processor menus.

---

## Service Processor Error Logs

The Service Processor error logs contain error conditions detected by the Service Processor

```
                                Error Log

19970626223337  0. Error detected..
                  4B00F010
                  B455440004B00710700001370000000000000000007420A400010000000
00000000000000

    Press "C" to clear error log, any other key to continue.  >
```

**Note:** The time stamp in this error log is Coordinated Universal Time (CUT) which is also referred to as Greenwich Mean Time (GMT). AIX error logs have more information available and can time stamp with local time.

---

## System POST Errors

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

```
                                Read System POST Errors

Version : 1
Severity : 2
Disposition : 0
Initiator : 0
Event being reported : 0
Extended Error Log Data:
c2 00 84 09 20 09 06 00
19 97 09 03 00 00 49 42
4d 2c 73 70 00 00 00 00
00 00 2b a0 00 13 00 01
00 00 00 00 00 00 00 00
49 42 4d 00 55 30 2e 31
2d 50 31 2d 58 31 00

                                (Press Return to Continue)
```

---

## LCD Progress Indicator Log

The following is an example of the LCD progress indicator log.

The progress indicators (check points) are displayed in two sections. Above the dashed line are the progress indicators from the boot that produced the current sessions. Below the dashed line are progress indicators from the boot preceding the one that produced the current sessions.

The progress indication codes are chronological from bottom to top. The dashed line merely represents the point where the latest boot started.

```
                LCD Progress Indicator Log
C33744FE
C33644FE
C33544FE
C33444FE
C33344FE
C33244FE
C33144FE
C33044FE
C1022001
C13F2090
C13F2060
C13F2050
C1012001
C1002001
C100D500
C100806E
-----
E075
E07A
E075

Press Return to continue, or 'x' to return to menu. >
```

---

## Update 10

This section contains updates made to:

- The *S70 User's Guide*, "Appendix D. Microcode Update Procedures."
- The *S70 Installation and Service Guide*, "Appendix D. Microcode Update Procedures."



---

## 6. Microcode Update Procedures

This section applies to all RS/6000 S70 versions. There is specific System Firmware (FW) and Service Processor (SP) microcode to support specific machine types and models.

---

### Determining the Microcode Versions

If the server is in operation, the installed microcode versions can be determined using AIX. If the server is about to be initialized, the installed microcode versions can be determined by using the SMS utilities for FW versions and SP menus for SP versions.

On S70 architecture servers, the AIX command `lscfg -pv | pg` produces a system configuration report. To read the report for SP, enter `/SP_CARD` on the command line. To read the report for firmware, enter `/openprom` on the command line. The following is an example of the `SP_CARD` report:

```
SP_CARD_:
  Part Number.....93H4228
  EC Level.....E76324A
  FRU Number.....93H4214
  Manufacture ID.....3966-1944843
  Serial Number.....00000089
  ROM Level (alterable).....19970801 (B) 19970530 (A)
```

The **ROM Level (alterable)** number corresponds to the version number. In this example, the system was booted from the B version since it is listed first. If the most recent version number (A or B) is less than the update version number available for your server, you should consider installing the update.

When you have determined the version number(s), exit the configuration report by typing `q` and then press Enter.

During system IPL, an ASCII terminal on serial port 1 or 2 can be used to access the SP menus. The SP version number is contained in the heading of the first menu. The following is an example of what the heading with the SP microcode version looks like:

```
Service Processor Firmware
  Version 19970801
  Copyright 1997 IBM Corporation
```

The numbers in the second line show the booted version number. If this version number is less than the update version number available for your server, you should consider installing the update.

Similarly, the FW version numbers can be accessed from the SMS utilities.

To determine the version of system microcode, power on your server and do the following:

- If you are using a graphics display:

Press F1 after the Keyboard icon appears but before the Speaker icon appears. When the tests have completed, and any required passwords have been entered, the SMS utilities menu appears.

When the graphics display is initialized and the icons begin to appear along the bottom of the screen, the microcode version is displayed in the bottom right-hand corner of the display.

- If you are using an ASCII terminal:

Press number 1 after the word 'keyboard' appears but before the word 'speaker' appears. When the tests have completed, and any required passwords have been entered, the SMS utilities menu appears. On the second line of the heading is a version number, date and time.

---

## Obtaining the Microcode Update Package

| Service Processor microcode update packages are available from the RS/6000  
| Support page on the Internet under RS/6000 Microcode Updates. The URL is:

| <http://www.rs6000.ibm.com/support/>

| Filenames are supplied in the table on the microcode download page. The most  
| current downloading, unpacking and installation instructions are on-line and included  
| in the download package.



---

## Downloading Microcode Updates

Prior to downloading the microcode, you are asked to read and accept the terms of the Machine Code License Agreement. Once you accept the terms, you are assigned a password. Write down this password as it is required later to unpack the files you download.

Find the most recent update package for your server. Print the description file and download ONE of the update file sets, depending on the workstation being used for downloading, as follows.

## Downloading to a DOS, OS/2 or Windows-based PC Workstation

In this process, you will create update diskettes for use at the server being updated.

1. Download the DOS format set of files to an empty subdirectory on your workstation.

**Note:** For the following instructions, we assume the name of this empty subdirectory is `d:[Path]\download`.

2. Execute each of these downloaded **\*.exe** files.

When prompted, enter the password assigned to you when you accepted the terms of the download agreement.

This unpacks the download(s) and makes them ready for local processing, creating a new subdirectory (we'll call `d:[path]\download\unpacked` for these instructions) containing some **\*.emt** files, the DSK4DOS utility and documentation (text) files. You can find the actual name of this directory by searching for the date on which it was created.

3. Have AIX-formatted diskettes ready (one for each **.emt** file in the `\download\unpacked` subdirectory). Insert one of the diskettes into your workstation diskette drive and enter the following commands at the DOS prompt:

```
cd d:[Path]\download\unpacked
DSK4DOS filenamex.emt a:
```

where `filenamex` represents each **.emt** filename.

This will create a diskette per processed file. These diskettes are the inputs for the update process. The diskette number is the last character (x) in the **\*.emt** filename.

Continue these transfers to diskette for each **.emt** file in the `d:[Path]\download\unpacked` directory.

4. Label the diskette(s) with the update name and version number, the diskette number (x), if there is more than one, the (short) list of files in the diskette, and the word BACKUP.
5. After reading the accompanying description and installation instructions, proceed to the installation instructions. When asked for the source of the update image, it is on the diskettes you just created.  
  
If there is any conflict in the instructions, those accompanying the update files take precedence.

## Downloading to an AIX Workstation

In this process, you will create update diskettes for use at the server being updated.

1. Download the AIX multiple-file format set of files, if there is one, to an empty subdirectory on your workstation. If there is no multi-file format selection, choose the available AIX selection.

**Note:** For the following instructions, we assume the name of this empty subdirectory is /home/download.

2. Execute each of the downloaded files. Be sure to call each file by its **complete** name, including the extension.

When prompted, enter the password assigned to you when you accepted the terms of the download agreement. Each execution will request the password.

This unpacks the download(s), creating a new subdirectory (we'll call it /home/download/unpacked for these instructions) containing some **.bak** files and documentation (text) files. You can find the actual name of this directory by searching for the date on which it was created.

3. Transfer the unpacked **.bak** file(s) to diskette(s) with the following AIX command:

```
dd if=/home/download/unpacked/[filename].bak of=/dev/rfd0/ bs=9216
```

**[filename]** represents the name of each file and **x** signifies the label number of each diskette image, if there are more than one.

Continue these transfers to diskette for each **.bak** file in the /home/download/unpacked directory. Other files that may appear in this directory are documentation (text) files.

4. Label the diskette(s) with the update name and version number, the diskette number (x), the (short) list of files on the diskette, and the word BACKUP.
5. After reading the accompanying description and installation instructions, proceed to the installation instructions. When asked for the source of the update image, it is on the diskette(s) you just created.

If there is any conflict in the instructions, those accompanying the update files take precedence.

### Downloading to the AIX Server You are Updating

1. Transfer the AIX single-file format file to an empty subdirectory on your server.

**Note:** For the following instructions, we assume the name of this empty subdirectory is `/home/download`.

2. Execute this file on your server. Be sure to call the file by its **complete** name, including the extension.

When prompted, enter the password assigned to you when you accepted the terms of the download agreement.

This unpacks the download, creating a new subdirectory (we'll call it `/home/download/unpacked` for these instructions) containing some **\*.bak** files and documentation (text) files. You can find the actual name of this directory by searching for the date on which it was created.

3. View the contents of subdirectory `/home/download/unpacked` to get the full name of the **.bak** file for use now and when installing the update.

4. Execute the following AIX command:

```
/etc/restore -x -f/home/download/unpacked/*.bak  
(replace * with the filename)
```

This creates a new subdirectory containing at least two **.img** files. Other files that may appear are documentation (text) files.

The new subdirectory name can be observed on your monitor during the execution of the restore command. For these instructions, we use an example name of `mcupdate` for the subdirectory. The actual subdirectory name may be different.

5. After reading any accompanying description and installation instructions, proceed to the installation instructions. When asked for the source of the update image, it is in the new subdirectory and has a **.img** filetype.

If there is any conflict in the instructions, those accompanying the update files take precedence.

---

### Update Process Overview

The following information provides an overview of the update process in general, and applies to all available update methods described on the following pages.

When updating from diskettes, insert the first diskette in the drive before selecting the Update System or Service Processor Flash service aid. This precaution ensures

proper early diskette recognition. The service aid, however, may still ask for the diskette even with it already in place.

To conserve resources in your server, restoring the update image from diskettes is a two-pass process. In the first pass, the service aid is collecting a list of filenames and sizes to be restored, and comparing resources needed to resources available.

If this first pass determines more resources are needed, it may request an increase in size for the file system /var. Use standard AIX techniques to do this. If the update image does not fit into this file system, the update cannot be successful. The second pass restores the update.

As the microcode update takes place, during the processes shutdown sequence following the microcode transfer, progress can be monitored from the operator panel. The checkpoints E080 and E081 alternately appear while the update is in progress.

At some points in the update process, these checkpoints may not change for one to ten minutes. If this occurs, be patient and allow the time for the update process to complete.

---

## **How to Install a Microcode Update**

Updating the microcode requires rebooting the server. The update is applied during the processes shutdown sequence following the microcode transfer. The next boot uses the updated microcode for its control.

The new microcode is placed in the IPL Type B location for use while your acceptance tests are under way. When you are satisfied with the performance of the new version, "promote" it to the IPL Type A location. There is no time limit on when promotion must occur. Thorough testing of any changes to your system is recommended before committing to them.

Keeping an archive of microcode levels allows recovery in case newer levels are found to create problems with your specific applications.

This section describes the update and promotion procedures.

Updating microcode in the S70 servers **MUST** be initiated from either the Update Flash Diagnostic Service Aid or directly from an AIX command line.

## Updating from the Service Aids

Review "Update System or Service Processor Flash" in the Service Aids section of the *RS/6000 Enterprise Server S70 User's Guide* for information about using this utility.

1. Invoke the Service Aids from either on-line or standalone diagnostics. For more information, refer to "Introduction to Tasks and Service Aids" in *Diagnostic Information for Multiple Bus Systems*.
2. Choose Update System or Service Processor Flash service aid.
3. Follow the on-screen update steps as they are presented.

When asked for the filename, first list the files and then select the appropriate one for your update. If the filenames contain numbers, begin with the filename that contains the number 1.

Following a successful update initialization, the server automatically performs the update, reboots, and loads at the new level. Since the update occurs during this shutdown/reboot sequence, it is important to protect the server from interruptions.

After acceptance testing is completed, make your microcode update permanent. See "Promoting the Microcode Update" on page 219.

## Updating from the AIX command line

The Service Aids collect the information needed to construct an AIX command. You can create that same command directly using the following syntax:

```
update_flash [-q] -f filename
```

or

```
update_flash [-q] -D device -l
```

or

```
update_flash [-q] -D device -f filename
```

where

- q updates the flash and reboots the system without asking for confirmation.
- D device specifies the flash image file is on diskette(s) in the specified device.
- f filename is the fully qualified pathname of the flash update image file.
- l provides a list of files on the diskette for the user to select the flash update image file. l is a lower case letter L.

For a microcode image file named "filename.img." located in a file system in the example path /tmp/mcupdate enter:

```
/usr/lpp/diagnostics/bin/update_flash -f /tmp/mcupdate/filename.img
```

For microcode images located on diskette(s), and to obtain a selection list of files on the diskette(s), enter:

```
/usr/lpp/diagnostics/bin/update_flash -D /dev/rfd0 -l
```

Information similar to the example below is displayed. Enter a numeric response.

Choose one of the following  
by number, then press "Enter":

0. No choice
1. [Path]filename.img
2. [Path]promote.img
3. [Path][other files]

For a microcode image file "filename.img" located on diskette, and to perform the update without asking the user for confirmation to reboot the system, enter:

```
/usr/lpp/diagnostics/bin/update_flash -D /dev/rfd0 -f filename.img -q
```

**Note:** A system reboot is necessary to update the microcode. The default action of the command is to locate the image file, then ask for confirmation to proceed with the microcode update and required reboot. If the -q flag is set, the command does not ask for confirmation before beginning the microcode update and reboot.

---

## Promoting the Microcode Update

Your S70 server allows a trial period for testing the update before committing to the new version. When this update has been tested thoroughly, refer to the commands you previously entered to install the update. Enter the same commands, this time specifying the filename **promote.img** rather than the filename you selected previously. Be aware that the promotion process requires the server to **shut down** its processes to rewrite IPL Type A and reboot from it.

Your S70 maintains two copies of System and Service Processor microcode. These copies reside in locations referred to as **IPL TYPE A** and **IPL TYPE B**.

Your server normally runs IPL Type A. New microcode updates are stored in IPL Type B until they are promoted. Once promotion takes place, the two IPL Types are identical.

When a microcode update is processed, the server automatically begins using IPL Type B. When promotion is processed, the server automatically begins using IPL Type A.

Between the time of a microcode update and the promotion procedure, the server may be instructed (using operator panel function 02) to use either IPL type for the purpose of microcode testing. When you are ready to promote the new microcode, the server **MUST** be using IPL Type B. Otherwise, the promotion fails. The recovery procedure is:

- Turn off the server power.
- Switch the server's operation to IPL Type B.
- Turn on the server power to IPL from Type B.

Operator panel function 01 may be used to determine which IPL type is in use at any given time. See "Operator Panel Function Descriptions" on page 150 for more information about these operator panel functions.

As the promotion occurs, during the processes shutdown sequence, checkpoint E082 appears during the promotion activity. This checkpoint can last up to a few minutes.

---

## **Archiving the Updates**

In the event it becomes necessary to restore your server to a previous microcode level, it is suggested you identify and archive the materials for each update you install.

If the download process produces diskettes, label and store them in a safe place.

If the download process produces only an update image file, archive and identify the file for convenient retrieval.



---

## Update 11

This section contains updates made to:

- The *S70 User's Guide*, "Appendix F. Modem Configurations."
- The *S70 Installation and Service Guide*, "Appendix E. Modem Configurations."



---

## 7. Modem Configurations

---

### Sample Modem Configuration Files

With hundreds of modems to choose from, and various modem programming standards, configuring a modem for use with the Service Processor can be challenging. The Service Processor is designed to place little demand on an attached modem, thereby increasing the setup and connection success rates. Several sample modem configuration files are supplied that will either work directly with your modem, or provide a good starting point for a custom setup, if required.

The sample modem configuration files can be found in your Service Processor firmware and in the `/usr/share/modems` subdirectory (if your server is using AIX) with the following names. A listing of each file is included at the end of this appendix.

#### *Generic Modem Configuration Files*

AIX File Name	SP Firmware File Name
modem_z_cfg	modem_z_sp
modem_z0_cfg	modem_z0_sp
modem_f_cfg	modem_f_sp
modem_f0_cfg	modem_f0_sp
modem_f1_cfg	modem_f1_sp

#### *Specific Modem Configuration Files*

AIX File Name	SP Firmware File Name
modem_m0.cfg	modem_m0_sp
modem_m1.cfg	modem_m1_sp

With the following selection procedures and your modem manual, one of these configuration files should be suitable for your use.

---

## Configuration File Selection

1. Is your modem an IBM 7852-400?

If yes, use modem configuration file `modem_m0_sp` and go to step 7 on page 225 below.

**Note:** The IBM 7852-400 modem has dip switches on the right hand side of the unit. See “IBM 7852-400 DIP Switch Settings” on page 227 for the correct switch settings.

If no, continue with step 2 below.

2. Is your modem an IBM 7857-017?

If yes, use modem configuration file `modem_m1_sp` and go to step 7 on page 225 below.

**Note:** The IBM 7857-017 modem has two telephone line connections on the back of the unit. One is marked “LL” (for Leased Line), and the other is marked “PTSN” (for Public Telephone Switched Network). The service processor expects to use the modem on the public network, so the telephone line should attach to the PTSN connector. Also, see the note on page 205.

If no, continue with step 3 below.

3. Does your modem respond to the extended command set (prefixed with &)?

If yes, go to step 5 below.

If no, continue with step 4 below.

4. Does your modem respond to:

a. ATZ reset command, or

b. ATZn reset commands, where n can be 0, 1, etc.?

If ATZ, configuration file `modem_z.cfg` is recommended.

If ATZn, configuration file `modem_z0.cfg` is recommended.

Go to step 7 on page 225 below.

5. Does your modem command set include a test for V.42 error correction at the remote modem (often called “Auto-Reliable Mode”)?

If yes, this test must be disabled. Sample configuration files `/usr/share/modem_m0.cfg` or `/usr/share/modem_m1.cfg` can be used as models to help you create a file for your particular modem. See “Customizing the Modem Configuration Files” on page 226. Go to 7 on page 225.

If no, go to 6 below.

6. Does your modem respond to:

- | a. AT&F reset command, or
  - | b. AT&Fn reset commands, where n can be 0, 1, etc.?
- | If AT&F, configuration file modem\_f.cfg is recommended.  
| If AT&Fn, configuration file modem\_f0.cfg or modem\_f1.cfg is recommended,  
| depending on which provides the hardware flow control profile.
- | 7. Selection is complete. If you find it necessary to adjust any of these configura-  
| tion files, do so with reference to the manual that came with your modem.<sup>1</sup> It is  
| recommended you select settings that enable hardware flow control and respond  
| to DTR.
- | **Note:** Some older modems do not respond to the commands X0 or &R1. You  
| should edit out these commands from the modem configuration file if yours is  
| such a modem. See your modem manual for more information.

## Examples For Using the Generic Sample Modem Configuration Files

Modem	Setup Z	Setup Z0 (Rare)	Setup F	Setup F0	Setup F1
AT&T DataPort 2001 **				X	
Bocamodem 1440E			X		
Hayes Smart Modem 300	X				
IBM 5841	X				
IBM 5843	X				
IBM 7851				X	
IBM 7852-10				X	
IBM 7855					X
USRobotics 36.6K Sportster					X
Zoom V.32			X		

**Note:** \*\* Ring interrupt only on first ring.

### Customizing the Modem Configuration Files

You can create your own modem configuration file(s) or modify the samples provided. After you customize your modem configuration files, you **MUST** access them via the Configure Remote Maintenance Policy Service Aid rather than from the SP menus.

**Note:** If you have already set up your serial ports, line speeds, authorizations and telephone numbers from the SP menus, specify your customized modem configuration files from the service aid.

If you have not already set up your serial ports, line speeds, authorizations and telephone numbers from the SP menus, you may set them up with the service aids while you specify your customized modem configuration files.

## IBM 7852-400 DIP Switch Settings

If you are using a 7852-400 modem to enable service processor communications, for proper operation, the DIP switches must be set according to the following table.

Switch	Position	Function
1	Up	Force DTR
2	Up	Flow Control &E4
3	Down	Result Codes Enabled
4	Down	Modem Emulation Disabled
5	Up	Auto Answer Enabled
6	Up	Maximum Throughput Enabled
7	Up	RTS Normal Functions
8	Down	Enable Command Mode
9	Down	Remote Digital Loopback Test Enabled
10	Up	Dial-Up Line Enabled
11	*Up	AT Responses Enabled (Extended Responses Disabled)
12	*Down	Asynchronous Operation
13	UP	28.8KB Line Speed
14	Up	
15	Up	CD and DSR Normal Functions
16	Up	2-Wire Leased Line Enabled

\* Only switches 11 and 12 are changed from the factory default settings.

## Terminal Emulators

The Service Processor is compatible with simple ASCII terminals, and therefore compatible with most emulators. It is for the cases when a remote session is handed off from Service Processor to the operating system that agreeing terminal emulators becomes important.

The server's operating system will have some built-in terminal emulators. Your server may also have a commercially available terminal emulation. It is important that the local and host computers select the same or compatible terminal emulators so the key assignments and responses will match. This will assure successful communications and control.

For best formatting, choose line wrap in your terminal emulator setup.

## Recovery Procedures

Line noises, power surges, etc., can sometimes cause your modem to enter an undefined state. When it is being used for dial in, dial out or Ring Indicate Power-On, your modem is initialized each time one of these actions is expected. If one of these environmental conditions occur after your modem has been initialized, it may be necessary to recover your modem to a known state.

If your modem communicates properly with remote users, it is probably in control. It may be wise to occasionally change some of the functional settings and then change them back, just for the sense of security that the modem is communicating, and to assure it has been initialized recently.

Another strategy, particularly if your system is difficult to access physically, is to protect it with an Uninterruptable Power Source (UPS) and a phone-line surge protector.

In case recovery becomes necessary, your system should be shut down as gracefully as possible. Disconnect and reconnect modem power, and power on the system to allow complete reinitialization of your system.



---

## Seamless Transfer of a Modem Session

There are about as many modem command variations as there are modems. The sample modem configuration files have been written to capture the largest number of workable modem settings.

The modem command `&Dn` (where 'n' is a number) generally sets the modem response to the Data Terminal Ready (DTR) signal from the server's serial port. The desired response is that the modem will hold a connection while DTR is enabled, and drop the connection when DTR is released. This is the mechanism by which the server "hangs up" on a connection under normal conditions.

Usually the command `&D2` will work, but not always. The sample modem configuration files take this high percentage position, see the note on page 230. You should consult your modem's manual for its specific response scheme for the `&Dn` command.

There are two methods for dealing with the modem's response to DTR:

1. Recovery
2. Prevention

Before proceeding with one of these strategies, you need to determine if your server's modem is set up properly to respond to DTR.

With the remote terminal connected to serial port 1 and defined as the **primary** console device, there are two tests you can perform:

1. Will the modem **drop** the connection after the "System initialization complete" message appears at the remote terminal?

If yes, this is the correct response. The modem is set up correctly.

If no, try another `&Dn` setting for your server's modem. See your modem manual for this information. The `&Dn` command appears in three places each in three of the sample modem configuration files, see the note on page 230.

2. Will the server's modem **disconnect** when the power drops? You can make this observation at the remote terminal by commanding your server to shutdown and power off. (The AIX command `shutdown -F` will do this.) Watch for the message `NO CARRIER` on your remote terminal.

If yes, this is the correct response. The modem is set up correctly.

If no, try another `&Dn` setting for your server's modem. See your modem manual for this information. The `&Dn` command appears in three places each in three of the sample modem configuration files, see the note on page 230

**Note:** Only the following sample modem configuration files contain the &Dn command (in three places each):

- modem\_f.cfg
- modem\_f0.cfg
- modem\_f1.cfg

If you are using modem\_z.cfg or modem\_z0.cfg, you cannot control DTR response. If your remote terminal does not disconnect after logging off, you must command the remote terminal emulator to hang up. This then breaks the connection.

## Recovery Strategy

The recovery strategy consists of making **three** calls to establish a remote session. This is the easiest solution to implement, and allows more freedom for configuring your server's serial ports.

To set up a remote terminal session, dial in to the server and start the system. Wait 5 minutes for the initialization period and call again to gain control via the Service Processor menus. Continue booting the system from the System Power control menu. After the operating system is loaded and initialized, the connection is dropped. At this point, when you call the server back the operating system answers and offers you the login prompt.

## Prevention Strategy

The disconnect is caused by the operating system when it initializes the **primary** console. The tests listed above are conducted with the remote terminal selected as the primary console to manifest the modem's response to DTR transitions.

If a local ASCII terminal or a graphics console is to be a permanent part of your server, then make one of them the primary console. Your remote terminal will no longer experience the connection loss.

If a local console is not a permanent part of your server, you can still assign either the unused graphics console or the unused serial port as the primary console. This gives you the desired seamless connection at your remote terminal.

If you choose to use the unused serial port as the primary console, some initialization traffic will be sent to any serial device attached to that port. As a result, that serial device's connection and function could be affected. These impacts may make that port unattractive for devices other than a temporary local ASCII terminal.

---

## Modem Configuration Samples

### Sample File modem\_z.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP Z
#
# FUNCTIONS: Modem configuration file for many early Hayes* compatible modems.
# This example uses the ATZ reset command to choose the factory defaults.
# This setup will work for many modems, but it is required for early vintage
# modems which respond to neither the ATZ0 reset command nor the extended (&)
# commands. Refer to your modem manual.
#
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code , Inserts delay in dialing commands
# Z Reset to factory defaults Q0 Turn on responses
# E0 Turn echo off Q1 Turn off responses
# V0 Use numeric responses S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up T = Tone mode. When used as T\r, it is a
# no op to maintain program synchronization
# when modem may/will echo the commands.
#
# %N Call-Out phone number %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout: send "ATZQ0T\r" # Reset to factory defaults.
         ignore "\r" or "OK\r\n" timeout 2 # Ignore modem response.
         send "ATE0T\r" # Initialize modem: Echo OFF,
         expect "\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
         send "ATQ0V0T\r" # Limit response codes.
         expect "\r" timeout 2 # Confirm commands successful.
         send "ATS0=0\r" # Set AutoAnswer OFF
         expect "\r" timeout 2 # Confirm command successful.
         done

connect: send "ATDT%N\r" # Tone dialing command.
         # %N from Call Home setup.

         # Expect a connection response.
         expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
         timeout 60
         done
```

```

retry:      send "A/"                      # Repeat the previous command.

                                                # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2          # Separate from previous data.
send "+++"      # Assure command mode.
delay 2          # Allow mode switching delay.
send "ATH0T\r"  # Set modem switch-hook down
                                                # (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2 # Ignore modem response.
send "ATE0Q1\r" # Initialize modem: Echo OFF,
                                                # Disable responses.

ignore "0\r" timeout 1
done

condin:  send "ATZQ0T\r"                  # Reset to factory defaults.
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r"                          # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0T\r"                        # Limit response codes.
expect "0\r" timeout 2                  # Confirm commands successful.
send "ATS0=2\r"                          # Set AutoAnswer ON
expect "0\r" timeout 2                  # Confirm command successful.
done

waitcall: ignore "2\r" timeout 1          # Ignore first ring.
expect "2\r" timeout 10                 # Pick up second ring
                                                # or timeout.
                                                # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page:     send "ATDT%N,,,,%R;\r"         # %N = pager call center number
                                                # Add enough commas to wait for
                                                # time to enter paging number.
                                                # %R = paging number

                                                # Confirm successful command.
expect "0\r" timeout 60
delay 2          # Wait before hanging up.
send "ATH0T\r"  # Hang up.
expect "0\r" timeout 2 # Confirm successful command.
done

ripo:     send "ATZQ0T\r"                  # Reset to factory defaults.
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r"                          # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0T\r"                        # Limit response codes.
expect "0\r" timeout 2                  # Confirm commands successful.
send "ATS0=0\r"                          # Set AutoAnswer OFF
expect "0\r" timeout 2                  # Confirm command successful.
done                                         # RI Power On enabled.

error:    # Handle unexpected modem
                                                # responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done

```

## Sample File modem\_z0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP Z0
#
# FUNCTIONS: Modem configuration file for some early Hayes* compatible modems.
# This example uses the ATZ0 reset command to choose the factory defaults.
# This setup is recommended for modems that will respond to the ATZ0 command
# and which do not respond to the extended (&) commands. Refer to your modem
# manual.
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code           , Inserts delay in dialing commands
# Z0 Reset. Restore Profile 0 Q0 Turn on responses
# E0 Turn echo off           Q1 Turn off responses
# V0 Use numeric responses    S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up                 X0=0 Limit modem response codes
#                             T = Tone mode. When used as T\r, it is a
#                             no op to maintain program synchronization
#                             when modem may/will echo the commands.
#
# %N Call-Out phone number    %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:  send "ATZ0Q0T\r"           # Reset modem. Select profile 0
          ignore "\0\r" or "\0K\r\n" timeout 2 # Ignore modem response.
          send "ATE0T\r"             # Initialize modem: Echo OFF,
          expect "\0\r" or "\0K\r\n" timeout 2 # Enable responses (Numeric),
          send "ATQ0V0X0T\r"         # Limit response codes.
          expect "\0\r" timeout 2     # Confirm commands successful.
          send "ATS0=0\r"            # Set AutoAnswer OFF
          expect "\0\r" timeout 2     # Confirm command successful.
          done

connect:  send "ATDT%N\r"            # Tone dialing command.
          # %N from Call Home setup.
          # Expect a connection response.
          expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
          timeout 60
          done

retry:   send "A/"                  # Repeat the previous command.
          # Expect a connection response.
```

```

expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2 # Separate from previous data.
send "+++" # Assure command mode.
delay 2 # Allow mode switching delay.
send "ATH0T\r" # Set modem switch-hook down
# (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2 # Ignore modem response.
send "ATE0Q1\r" # Initialize modem: Echo OFF,
# Disable responses.

ignore "0\r" timeout 1
done

condin: send "ATZ0Q0T\r" # Reset modem. Select profile 0
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r" # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r" # Limit response codes.
expect "0\r" timeout 2 # Confirm commands successful.
send "ATS0=2\r" # Set AutoAnswer ON
expect "0\r" timeout 2 # Confirm command successful.
done

waitcall: ignore "2\r" timeout 1 # Ignore first ring.
expect "2\r" timeout 10 # Pick up second ring
# or timeout.
# Expect a connection response.

expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page: send "ATDT%N,,,,%R;\r" # %N = pager call center number
# Add enough commas to wait for
# time to enter paging number.
# %R = paging number

# Confirm successful command.

expect "0\r" timeout 60
delay 2 # Wait before hanging up.
send "ATH0T\r" # Hang up.
expect "0\r" timeout 2 # Confirm successful command.
done

ripo: send "ATZ0Q0T\r" # Reset modem. Select profile 0
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r" # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r" # Limit response codes.
expect "0\r" timeout 2 # Confirm commands successful.
send "ATS0=0\r" # Set AutoAnswer OFF
expect "0\r" timeout 2 # Confirm command successful.
done # RI Power On enabled.

error: # Handle unexpected modem
# responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done

```

## Sample File modem\_f.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
# This example uses the AT&F reset command to choose the factory defaults.
# This set up is preferred for modems with extended (&) commands. For early
# vintage modems, setup Z or Z0 is recommended. If your modem responds to
# the extended (&) commands and to factory default choices (&Fn), setup file
# F0 or F1 is recommended.
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code           , Inserts delay in dialing commands
# &F Reset to default profile Q0 Turn on responses
# E0 Turn echo off           Q1 Turn off responses
# V0 Use numeric responses   S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up                 X0=0 Limit modem response codes
#
#                               T = Tone mode. When used as T\r, it is a
#                               no op to maintain program synchronization
#                               when modem may/will echo the commands.
#
# &C1 Detect CD               &D2 Respond to DTR (often the default)
#
# %N Call-Out phone number   %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:  send "AT&FQ0T\r"           # Reset to factory defaults.
          ignore "\0\r" or "OK\r\n" timeout 2 # Ignore modem response.
          send "ATE0T\r"           # Initialize modem: Echo OFF,
          expect "\0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
          send "ATQ0V0X0T\r"       # Limit response codes.
          expect "\0\r" timeout 2   # Confirm commands successful.
          send "ATS0=0\r"          # Set AutoAnswer OFF
          expect "\0\r" timeout 2   # Confirm command successful.
          send "AT&C1&D2\r"       # Detect carrier and DTR.
          expect "\0\r" timeout 2   # Confirm command successful.
          done

connect:  send "ATDT%N\r"          # Tone dialing command.
          # %N from Call Home setup.

          # Expect a connection response.
          expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
          timeout 60
```

```

done

retry:    send "A/"                # Repeat the previous command.

                                                # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2                # Separate from previous data.
send "+++"            # Assure command mode.
delay 2                # Allow mode switching delay.
send "ATH0T\r"        # Set modem switch-hook down
                                                # (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2 # Ignore modem response.
send "ATE0Q1\r"       # Initialize modem: Echo OFF,
                                                # Disable responses.

ignore "0\r" timeout 1
done

condin:   send "AT&F00T\r"        # Reset to factory defaults.
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r"                    # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r"                # Limit response codes.
expect "0\r" timeout 2             # Confirm commands successful.
send "ATS0=2\r"                    # Set AutoAnswer ON
expect "0\r" timeout 2             # Confirm command successful.
send "AT&C1&D2\r"                  # Detect carrier and DTR.
expect "0\r" timeout 2             # Confirm command successful.
done

waitcall: ignore "2\r" timeout 1    # Ignore first ring.
expect "2\r" timeout 10            # Pick up second ring
                                                # or timeout.
                                                # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page:     send "ATDT%N,,,%R;\r"    # %N = pager call center number
                                                # Add enough commas to wait for
                                                # time to enter paging number.
                                                # %R = paging number

                                                # Confirm successful command.
expect "0\r" timeout 60
delay 2                # Wait before hanging up.
send "ATH0T\r"        # Hang up.
expect "0\r" timeout 2 # Confirm successful command.
done

ripo:    send "AT&F00T\r"        # Reset to factory defaults.
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r"                    # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r"                # Limit response codes.
expect "0\r" timeout 2             # Confirm commands successful.
send "ATS0=0\r"                    # Set AutoAnswer OFF
expect "0\r" timeout 2             # Confirm command successful.
send "AT&C1&D2\r"                  # Detect carrier and DTR.
expect "0\r" timeout 2             # Confirm command successful.
done                                # RI Power On enabled.

error:   # Handle unexpected modem
         # responses.

```



```
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"  
delay 2  
done
```

## Sample File modem\_f0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F0
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
# This example uses the AT&F0 reset command to choose the factory defaults.
# This set up is preferred for modems with extended (&) commands. For early
# vintage modems, setup Z or Z0 is recommended. If your modem responds to
# the extended (&) commands and to factory default choices (&Fn), but doesn't
# work properly with this setup file, setup F1 is recommended.
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code , Inserts delay in dialing commands
# &F0 Reset. Restore profile 0 Q0 Turn on responses
# E0 Turn echo off Q1 Turn off responses
# V0 Use numeric responses S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up X0=0 Limit modem response codes
#
# T = Tone mode. When used as T\r, it is a
# no op to maintain program synchronization
# when modem may/will echo the commands.
#
# &C1 Detect CD &D2 Respond to DTR (often the default)
# &R1 Ignore RTS (CTS)
#
# %N Call-Out phone number %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout: send "AT&F0Q0T\r" # Reset modem. Select profile 0
         ignore "\r" or "OK\r\n" timeout 2 # Ignore modem response.
         send "ATE0T\r" # Initialize modem: Echo OFF,
         expect "\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
         send "ATQ0V0X0T\r" # Limit response codes.
         expect "\r" timeout 2 # Confirm commands successful.
         send "ATS0=0\r" # Set AutoAnswer OFF
         expect "\r" timeout 2 # Confirm command successful.
         send "AT&C1&D2&R1\r" # Detect carrier and DTR,
         # Ignore RTS.
         expect "\r" timeout 2 # Confirm command successful.
         done

connect: send "ATDT%N\r" # Tone dialing command.
         # %N from Call Home setup.
         # Expect a connection response.
```

```

expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

retry:    send "A/"                                # Repeat the previous command.

                                                # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
    delay 2                                        # Separate from previous data.
    send "+++"                                    # Assure command mode.
    delay 2                                        # Allow mode switching delay.
    send "ATH0T\r"                                # Set modem switch-hook down
                                                # (i.e., hang up).
    ignore "0\r" or "OK\r" timeout 2              # Ignore modem response.
    send "ATE0Q1\r"                               # Initialize modem: Echo OFF,
                                                # Disable responses.

    ignore "0\r" timeout 1
done

conдин:    send "AT&F0Q0T\r"                      # Reset modem. Select profile 0
    ignore "0\r" or "OK\r\n" timeout 2           # Ignore modem response.
    send "ATE0T\r"                               # Initialize modem: Echo OFF,
    expect "0\r" or "OK\r\n" timeout 2           # Enable responses (Numeric),
    send "ATQ0V0X0T\r"                          # Limit response codes.
    expect "0\r" timeout 2                       # Confirm commands successful.
    send "ATS0=2\r"                              # Set AutoAnswer ON
    expect "0\r" timeout 2                       # Confirm command successful.
    send "AT&C1&D2&R1\r"                        # Detect carrier and DTR,
                                                # Ignore RTS.
    expect "0\r" timeout 2                       # Confirm command successful.
done

waitcall: ignore "2\r" timeout 1                 # Ignore first ring.
    expect "2\r" timeout 10                      # Pick up second ring
                                                # or timeout.
                                                # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page:     send "ATDT%N,,,%R;\r"                 # %N = pager call center number
                                                # Add enough commas to wait for
                                                # time to enter paging number.
                                                # %R = paging number

                                                # Confirm successful command.
    expect "0\r" timeout 60
    delay 2                                       # Wait before hanging up.
    send "ATH0T\r"                               # Hang up.
    expect "0\r" timeout 2                       # Confirm successful command.
done

riрo:     send "AT&F0Q0T\r"                      # Reset modem. Select profile 0
    ignore "0\r" or "OK\r\n" timeout 2           # Ignore modem response.
    send "ATE0T\r"                               # Initialize modem: Echo OFF,
    expect "0\r" or "OK\r\n" timeout 2           # Enable responses (Numeric),
    send "ATQ0V0X0T\r"                          # Limit response codes.
    expect "0\r" timeout 2                       # Confirm commands successful.
    send "ATS0=0\r"                              # Set AutoAnswer OFF
    expect "0\r" timeout 2                       # Confirm command successful.
    send "AT&C1&D2&R1\r"                        # Detect carrier and DTR,
                                                # Ignore RTS.
    expect "0\r" timeout 2                       # Confirm command successful.

```

```
done                                # RI Power On enabled.
error:                               # Handle unexpected modem
                                     # responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done
```

## Sample File modem\_f1.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F1
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
# This example uses the AT&F1 reset command to choose the factory defaults.
# This set up is for modems with extended (&) commands and which do not work
# properly with setup F0. For early vintage modems, setup Z or Z0 is
# recommended.
#
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code          , Inserts delay in dialing commands
# &F1 Reset. Restore profile 1 Q0 Turn on responses
# E0 Turn echo off          Q1 Turn off responses
# V0 Use numeric responses   S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up                X0=0 Limit modem response codes
#                             T = Tone mode. When used as T\r, it is a
#                             no op to maintain program synchronization
#                             when modem may/will echo the commands.
#
#
# &C1 Detect CD              &D2 Respond to DTR (often the default)
# &R1 Ignore RTS (CTS)
#
# %N Call-Out phone number  %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:  send "AT&F1Q0T\r"          # Reset modem. Select profile 1
          ignore "\0\r" or "OK\r\n" timeout 2 # Ignore modem response.
          send "ATE0T\r"            # Initialize modem: Echo OFF,
          expect "\0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
          send "ATQ0V0X0T\r"        # Limit response codes.
          expect "\0\r" timeout 2    # Confirm commands successful.
          send "ATS0=0\r"            # Set AutoAnswer OFF
          expect "\0\r" timeout 2    # Confirm command successful.
          send "AT&C1&D2&R1\r"      # Detect carrier and DTR,
          # Ignore RTS.
          expect "\0\r" timeout 2    # Confirm command successful.
          done

connect:  send "ATDT%N\r"           # Tone dialing command.
          # %N from Call Home setup.
          # Expect a connection response.
          expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
```

```

timeout 60
done

retry:    send "A/"                # Repeat the previous command.

# Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2          # Separate from previous data.
send "+++"      # Assure command mode.
delay 2          # Allow mode switching delay.
send "ATH0T\r"  # Set modem switch-hook down
                # (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2 # Ignore modem response.
send "ATE0Q1\r" # Initialize modem: Echo OFF,
                # Disable responses.

ignore "0\r" timeout 1
done

condin:  send "AT&F1Q0T\r"        # Reset modem. Select profile 1
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r"                    # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r"                # Limit response codes.
expect "0\r" timeout 2             # Confirm commands successful.
send "ATS0=2\r"                    # Set AutoAnswer ON
expect "0\r" timeout 2             # Confirm command successful.
send "AT&C1&D2&R1\r"              # Detect carrier and DTR,
# Ignore RTS.
expect "0\r" timeout 2             # Confirm command successful.
done

waitcall: ignore "2\r" timeout 1    # Ignore first ring.
expect "2\r" timeout 10            # Pick up second ring
# or timeout.
# Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page:    send "ATDT%N,,,%R;\r"     # %N = pager call center number
# Add enough commas to wait for
# time to enter paging number.
# %R = paging number

# Confirm successful command.
expect "0\r" timeout 60
delay 2          # Wait before hanging up.
send "ATH0T\r"  # Hang up.
expect "0\r" timeout 2 # Confirm successful command.
done

ripo:    send "AT&F1Q0T\r"        # Reset modem. Select profile 1
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r"                    # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r"                # Limit response codes.
expect "0\r" timeout 2             # Confirm commands successful.
send "ATS0=0\r"                    # Set AutoAnswer OFF
expect "0\r" timeout 2             # Confirm command successful.
send "AT&C1&D2&R1\r"              # Detect carrier and DTR,
# Ignore RTS.
expect "0\r" timeout 2             # Confirm command successful.
done                                # RI Power On enabled.

```

```
error:                                     # Handle unexpected modem
                                           # responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done
```

## Sample File modem\_m0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP: modem_m0
#
# FUNCTIONS: Modem configuration file specifically for IBM 7852-4000
# modem with Auto-Reliable feature. This feature must be turned off
# for Catcher calls. This example uses the AT&F reset command to
# choose the factory defaults.
#
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#
#
# The modem has configuration switches. They should be set to the
# factory default settings, except switches 11 and 12. These must be
# to UP ("AT" responses) and DOWN (Asynchronous operation), respectively.

ICDelay 1
DefaultTO 10
CallDelay 120
#
# %N Call-Out phone number %R Return phone number
#
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout: send "AT&F&E2E0T\r"          # Reset to factory defaults
          # Reliable mode
          # Echo off
          ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
          send "AT&E12&E14\r"          # Disable pacing
          # Disable data compression
          expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful.
          send "AT&SF1&S0S9=1\r"        # DSR independent of CD
          # Force DSR on.
          # CD respond time=100ms
          expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful.
          send "ATV0S0=0\r"            # Numeric response code
          # Auto-Answer off
          expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful.
          done

connect:  send "ATDT%N\r"              # Tone dialing command.
          # %N from Call Home setup.
          # Expect a connection response.
          expect "33\r" or "31\r" or "28\r" or "26\r" or "24\r" or "21\r" or
"19\r" or "13\r" or "12\r" or "1\r" busy "7\r"
          timeout 60
          done

retry:    send "A/"                    # Repeat the previous command.
          # Expect a connection response.
          expect "33\r" or "31\r" or "28\r" or "26\r" or "24\r" or "21\r" or
"19\r" or "13\r" or "12\r" or "1\r" busy "7\r"
          timeout 60
          done

disconnect:
          delay 2                       # Separate from previous data.
          send "+++"                     # Assure command mode.
          delay 2                         # Allow mode switching delay.
          send "ATH0T\r"                 # Set modem switch-hook down
```



```

# (i.e., hang up).
ignore "\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0Q1\r" # Initialize modem: Echo OFF,
# Disable responses.

ignore "\r" timeout 1
done

conдин: send "AT&F&E2E0\r" # Reset to factory defaults.
# Reliable mode
# Echo off
ignore "\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "AT&E12&E14\r" # Disable pacing
# Disable data compression
expect "\r" or "OK\r\n" timeout 2 # Confirm commands successful
send "AT&SF1&S0S9=1\r" # DSR independent of CD.
# Force DSR on.
# CD respond time=100ms
expect "\r" or "OK\r\n" timeout 2 # Confirm commands successful.
send "ATV0S0=2\r" # Numeric response code
# Answer on 2nd ring
expect "\r" timeout 2 # Confirm commands successful.
done

waitcall: ignore "2\r" timeout 1 # Ignore first ring.
expect "2\r" timeout 10 # Pickup 2nd ring or timeout
# Expect a connection response.
expect "33\r" or "31\r" or "28\r" or "26\r" or "24\r" or "21\r" or
"19\r" or "13\r" or "12\r" or "1\r" busy "7\r"
timeout 60
done

page: send "ATDT%N,,,%R;\r" # %N = pager call center number
# Add enough commas to wait for
# time to enter paging number.
# %R = paging number
expect "\r" timeout 60 # Confirm successful command.
delay 2 # Wait before hanging up.
send "ATH0\r" # Hang up.
expect "\r" timeout 2 # Confirm successful command.
done

riпо: send "AT&F&E2E0\r" # Reset to factory defaults.
# Reliable mode
# Echo off
ignore "\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "AT&E12&E14\r" # Disable pacing
# Disable data compression
expect "\r" or "OK\r\n" timeout 2 # Confirm successful command.
send "AT&SF1&S0S9=1\r" # DSR independent of CD.
# Force DSR on.
# CD respond time=100ms
expect "\r" or "OK\r\n" timeout 2 # Confirm commands successful.
send "ATV0S0=0\r" # Numeric response code
# Auto Answer OFF
expect "\r" timeout 2 # Confirm commands successful.
done

error: # Handle unexpected modem
# responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done

```

## Sample File modem\_m1.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP modem_m1
#
# FUNCTIONS: Modem configuration file specifically for IBM 7857-017 modem with
# Auto-Reliable feature. This feature must be turned off for Catcher calls.
# This example uses the AT&F reset command to choose the factory defaults.
#
# To allow dial commands for digital pagers, it is necessary to reduce
# the number of characters in the dial command. Each comma (delay) has
# been set to 6 seconds (S8=6) for that reason.
#
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#

ICDelay 1
DefaultTO 10
CallDelay 120
#
# %N Call-Out phone number %R Return phone number
#
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout: send "AT&F*E0E0\r" # Reset to factory defaults.
# *E0=data compression disabled
# E0=echo disabled
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "AT#F0*Q2S8=6\r" # Trellis modulation disabled
# Retrain with adaptive rate
# Set ,=6second
expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful
send "ATV0XS0=0\r" # Numeric response code
# AT compatible messages
# Auto-Answer disabled
expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful.
done

connect: send "ATDT%N\r" # Tone dialing command.
# %N from Call Home setup.
expect "1\r" busy "7\r" timeout 60 # Expect a connection response.
done

retry: send "A/" # Repeat the previous command.
expect "1\r" busy "7\r" timeout 60 # Expect a connection response.
done

disconnect:
delay 2 # Separate from previous data.
send "+++" # Assure command mode.
delay 2 # Allow mode switching delay.
send "ATH0\r" # Set modem switch-hook down
# (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2 # Ignore modem response.
send "ATE0Q1\r" # Initialize modem: Echo OFF,
# Disable responses.

ignore "0\r" timeout 1
done

condin: send "AT&F*E0E0\r" # Reset to factory defaults.
```

```

# *E0=data compression disabled
# E0=echo disabled
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "AT#F0*Q2\r" # Trellis modulation disabled
# Retrain with adaptive rate
expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful
send "ATV0X0S0=2\r" # Numeric response code
# AT compatible messages
# Answer on 2nd ring
# Confirm commands successful.
expect "0\r" timeout 2
done

waitcall: ignore "2\r" timeout 1 # Ignore first ring.
expect "2\r" timeout 10 # Pick up second ring
# or timeout.
# Expect a connection response.
expect "1\r" timeout 60
done

page: send "ATD%N,%R\r" # %N = pager call center number
# commas=6sec wait time to
# enter paging number.
# %R = return number
# Confirm successful command.
expect "0\r" or "3\r" timeout 30 # Wait before hanging up.
delay 2 # Assure command mode.
send "+++" # Allow mode switching delay.
delay 2 # Hang up.
send "ATH0\r" # Confirm successful command.
expect "0\r" timeout 2
done

ribo: send "AT&F*E0E0\r" # Reset to factory defaults.
# *E0=data compression disabled
# E0=echo disabled
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "AT#F0*Q2\r" # Trellis modulation disabled
# Retrain with adaptive rate
expect "0\r" or "OK\r\n" timeout 2 # Confirm successful command.
send "ATV0X0S0=0\r" # Numeric response code
# AT compatible messages
# Auto-Answer disabled
# Confirm commands successful.
expect "0\r" timeout 2
done

error: # Handle unexpected modem
# responses.
expect "8\r" or "7\r" or "4\r" or "3\r"
delay 2
done

```





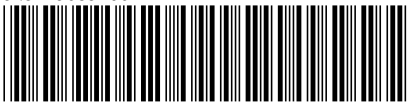


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