Bull ESCALA PL 220T & PL 220R

User’s Guide

ORDER REFERENCE
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Bull ESCALA PL 220T & PL 220R

User's Guide

Hardware

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Safety Notices

A *danger* notice indicates the presence of a hazard that has the potential of causing death or serious personal injury. *Danger* notices appear on the following pages:
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A *caution* notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury. A Caution notice appears on the following pages:
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viii

Rack Safety Instructions

- Do not install this unit in a rack where the internal rack ambient temperatures will exceed 40 degrees C.
- Do not install this unit in a rack where the air flow is compromised. Any side, front or back of the unit used for air flow through the unit must not be in indirect contact with the rack.
- Care should be taken to insure that a hazardous condition is not created due to uneven mechanical loading when installing this unit in a rack. If the rack has a stabilizer it must be firmly attached before installing or removed this unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to the rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement for the supply circuit.
- An electrical outlet that is not correctly wired could place hazardous voltage on the 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.

Electrical Safety

Observe the following safety instructions any time you are connecting or disconnecting devices attached to the workstation.

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 four–wire power cable and plug for the user's safety. Use this power cable with a properly grounded electrical outlet to avoid electrical shock.

DANGER

To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

Laser Safety Information

CAUTION:
This product may contain a CD–ROM which is a class 1 laser product..

Laser Compliance

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with the IEC 825 (first edition 1984) as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:
All laser modules are designed so that there is never any human access to laser radiation above a class 1 level during normal operation, user maintenance, or prescribed service conditions. Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. Only trained service personnel should perform the inspection or repair of optical fiber cable assemblies and receptacles

Environmental Notices

Product Recycling and Disposal

This unit contains materials such as circuit boards and connectors with lead that require special handling and disposal at end of life. Before this unit is disposed, these materials must be removed and recycled or discarded according to applicable regulations. This manual contains specific information on batteries where applicable. Contact your account representative for more information. This product may contain nickel–cadmium and /or lithium batteries. The battery(s) must be recycled or disposed of properly. Recycling facilities may not be available in your area.

For information on reuse, recycling or proper battery disposal procedures, contact your sales representative or local waste disposal facility.

Unit emissions

The unit–related emission value is equal to or lower than 70dB(A).

Der Geräuschpegel der Einheit ist kleiner oder gleich 70 db(A).

About this Book

This book provides information about the ESCALA PL 220T and ESCALA PL 220R, specifically how to use the system, use diagnostics and service aids, and verify system operation. In this book, the ESCALA PL 220T and ESCALA PL 220R are hereafter referred to as the ”server.”

ISO 9000

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

Related Publications

The following publications are available:

- The *System Unit Safety Information*, order number 86 X1 11WD, contains translations of safety information used throughout this book.
- The *Installation Guide*, order number 86 A1 78EF, contains information on how to set up and cable the system, install and remove options, and verify system operation.
- The *Service Guide*, order number 86 A1 79EF, contains reference information, maintenance analysis procedures (MAPs), error codes, removal and replacement procedures, and a parts catalog.
- The *T00 Rack Installation and Service Guide*, order number 86 A1 94KX, contains information regarding the Model T00 Rack, in which the EPC810 may be installed.
- The *Diagnostic Information for Multiple Bus Systems*, order number 86 A1 26HX, contains information and procedures that are common to all systems.
- The *Adapters for Multiple Bus Systems*, order number 86 A1 27HX, contains cabling and technical information about some of the adapters and devices available for your system unit.
- The *Site Preparation for Rack Systems*, order number 86 A1 30PX, provides a step–by–step approach to prepare a customer site dor the installation of single and multiple rack–mounted machines together with their subsystems and peripherals.
- The *Disks and Tapes Configuration Information*, order number 86 A1 88GX, gives the jumper and switch settings to configure disks and tapes peripherals that use the Small Computer System Interface (SCSI).

Chapter 1. Introducing the System

This chapter provides information on the system features of the ESCALA PL 220T and ESCALA PL 220R. The Model PL 220T is a deskside system and the Model PL 220R is a rack mount system.

System Features

Bus Architecture

Five PCI slots are available:

- Two 64–bit PCI full–size slots at 50 MHz (can also run at 33MHz), 3.3 volts
- One 64–bit PCI full–size slots at 33 MHz, 5 volts
- Two 32–bit PCI full–size slots at 33 MHz, 5 volts

Processors

One or two one–way processor cards

333 MHz with 4 MB L2 cache

OR

375 MHz with 4 MB L2 cache

OR

450 MHz with 8 MB L2 cache

Memory

- 256 MB (minimum) – 8 GB (maximum) with 333 MHz processor.
- 512 MB (minimum) – 8 GB (maximum).

Up to sixteen dual inline memory modules, installed in pairs, to support 256 MB or 512 MB (must be installed in matched pairs)

Media Drives

- 3.5–inch, 1.44 MB Diskette Drive (standard)
- Three media bays available
  - Optional disk bay (behind operator panel
  - Optional media bay
  - CD–ROM bay
- Six hot plug disk drives
- 40x speed CD–ROM drive with sliding tray

Other Drives

Media bays can accommodate 5.25–inch or 3.5–inch drives such as CD–ROM drives, tape drives, or other removable media drives.

Power supply

Up to three 250–watt; third power supply is for redundant power.

Keyboard

- Standard: 101–key enhanced keyboard
- 101/102 or 106–key enhanced keyboard

Mouse

- Three–button

Operator Panel

- 32–character LED diagnostics display
- Power and Reset buttons

Input/Output Ports

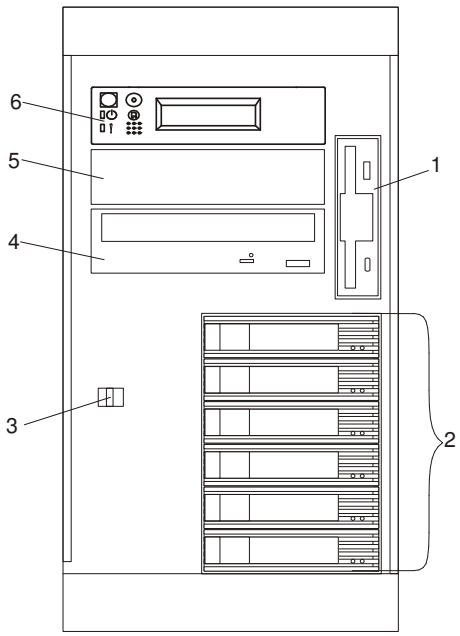
- 25–pin Parallel
- 9–pin Serial (3)
- Keyboard
- Mouse
- Ultra3 160 SCSI
- Integrated Drive Electronics (IDE)
- 10BaseT5 and 100BaseTX Ethernet

Security Features

- Power–on password
- Privileged–access password
- Security bolt (optional)
- Key lock
- Unattended start mode

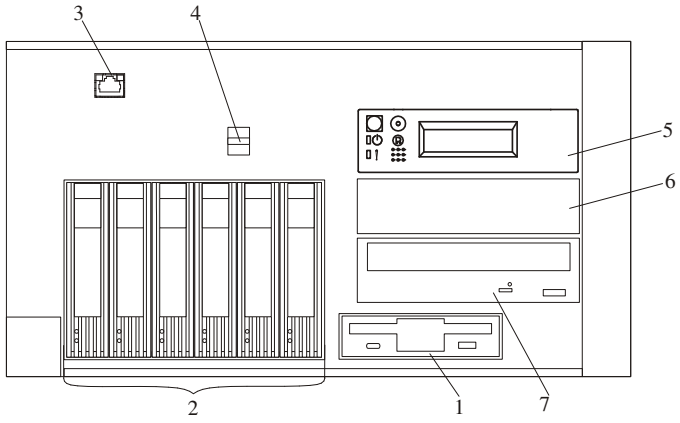
Front View

Model PL 220T



1	Diskette drive	**2**	Hot–swap disk drives
3	Cover release lever	**4**	CD–ROM drive
5	Media bay	**6**	Operator panel

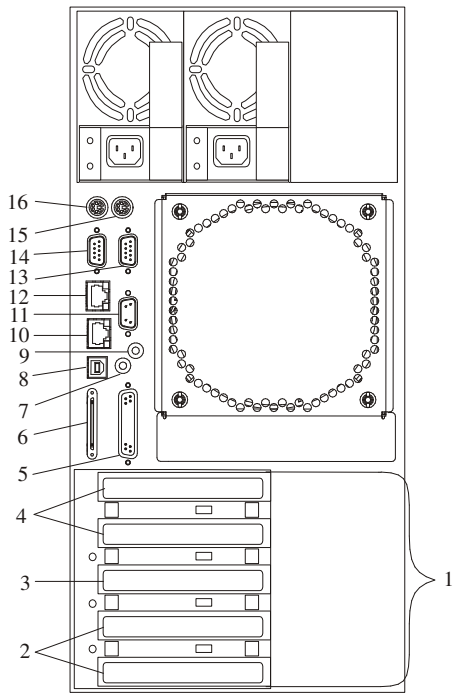
Model PL 220R



1	Diskette drive	**2**	Hot–swap disk drives
3	Serail port connector	**4**	Cover release lever
5	Operator panel	**6**	Media bay
7	CD–ROM drive		

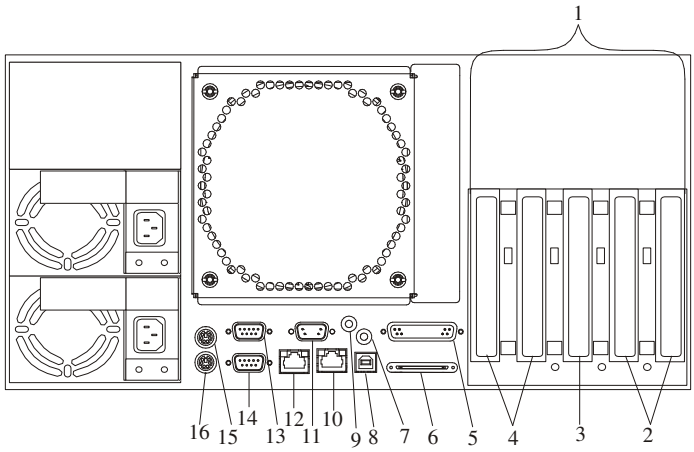
Rear View

Model PL 220T



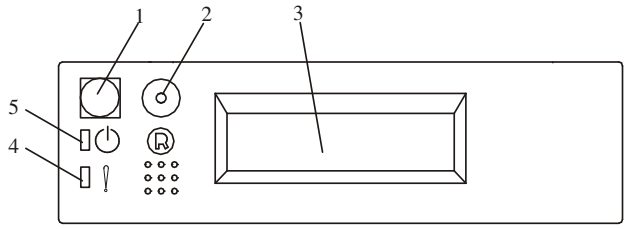
1	PCI slots 1–5	**2**	PCI slots 1–2 64–bit/3.3V
3	PCI slot 3 64–bit/5V	**4**	PCI slots 4–5 32–bit/3.3V
5	Parallel connector	**6**	SCSI connector
7	Attention LED	**8**	Rack indicator connector
9	Power LED	**10**	Ethernet connector 2
11	Serial connector 1	**12**	Ethernet connector 1
13	Serial connector 3	**14**	Serial connector 2
15	Mouse connector	**16**	Keyboard connector

Model PL 220R



1	PCI slots 1–5	**2**	PCI slots 1–2 64–bit/3.3V
3	PCI slot 3 64–bit/5V	**4**	PCI slots 4–5 32–bit/3.3V
5	Parallel connector	**6**	SCSI connector
7	Attention LED	**8**	Rack indicator connector
9	Power LED	**10**	Ethernet connector 2
11	Serial connector 1	**12**	Ethernet connector 1
13	Serial connector 3	**14**	Serial connector 2
15	Mouse connector	**16**	Keyboard connector

Operator Panel



1	Power–on switch	**2**	Reset switch
3	Display	**4**	Attention LED
5	Power–on LED		

Chapter 2. Using the System

This chapter provides information on how to start and use the system.

Starting the System Unit

1. Set the power switches of the attached devices to On.

Note: When the system is plugged in but not powered on, the Power–On LED flashes slowly.

2. If the LED is not flashing and OK is not displayed, ensure that the power cord, located at the back of the system unit, is plugged into a grounded electrical outlet.
3. If this does not solve the problem, go to Chapter 8: “Hardware Problem Determination”.
4. Press the Power–On switch.

   When you press the Power–On switch, the Power–On LED comes on, and the system starts a POST (power–on self–test).

   During POST, progress codes display in the operator panel display.
5. If the Power–On LED does not come on and there is no indication of power when you press the Power–On switch, go to Chapter 8: “Hardware Problem Determination”.

Stopping the System Unit

Attention: When you use the shutdown procedure for your system, follow the correct shutdown procedure before you stop the system. Failure to do so can result in the loss of data. The system is powered down by the shutdown procedure.

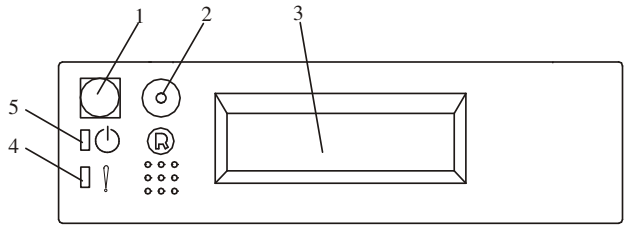
1. At a command line, type `shutdown` to stop the operating system.
2. After you shut down the operating system, set the power switches of any attached devices to Off.
3. If you will be servicing the system, unplug the system–unit power cable from the electrical outlet.

Reading the Operator Panel Display

The operator panel display is used to:

- Track the progress of the system unit self–tests and configuration program
- Display codes when the operating system comes to an abnormal end
- Display system messages

Operator Panel



Number	Component Name	Component Description
1	Power–On Switch	Turns the system drawer's power on and off.
2	Reset Switch	Function depends upon the operating system.
3	Power–On LED	Glows green when the system is powered on and blinks slowly when the system is in stand-by mode.
4	System Attention LED (System Fault/System Identify Indicator)	Glows amber when the system is in the following states: • **Normal State** – LED is off • **Fault State** – LED is on solid • **Identify State** – LED is blinking
5	Operator Panel Display	Displays current status of system drawer start-up, or diagnostic information in the event of a hardware problem.

Attention LED and Lightpath LEDs

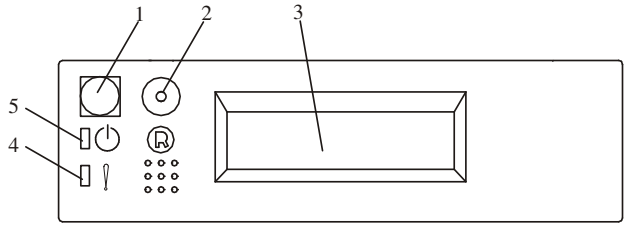
The Attention and Lightpath LEDs provide a means to identify failing components in your server.

Operator Panel Display

When a failing component is detected in your server, the Attention LED is turned on. To further help you identify the failing component, go to the indicator panel (see Indicator Panel) inside the server and check which LEDs are on. If either of the following conditions exist:

- No LEDs lit on the indicator panel
- PCI LED is the only LED lit on the indicator panel

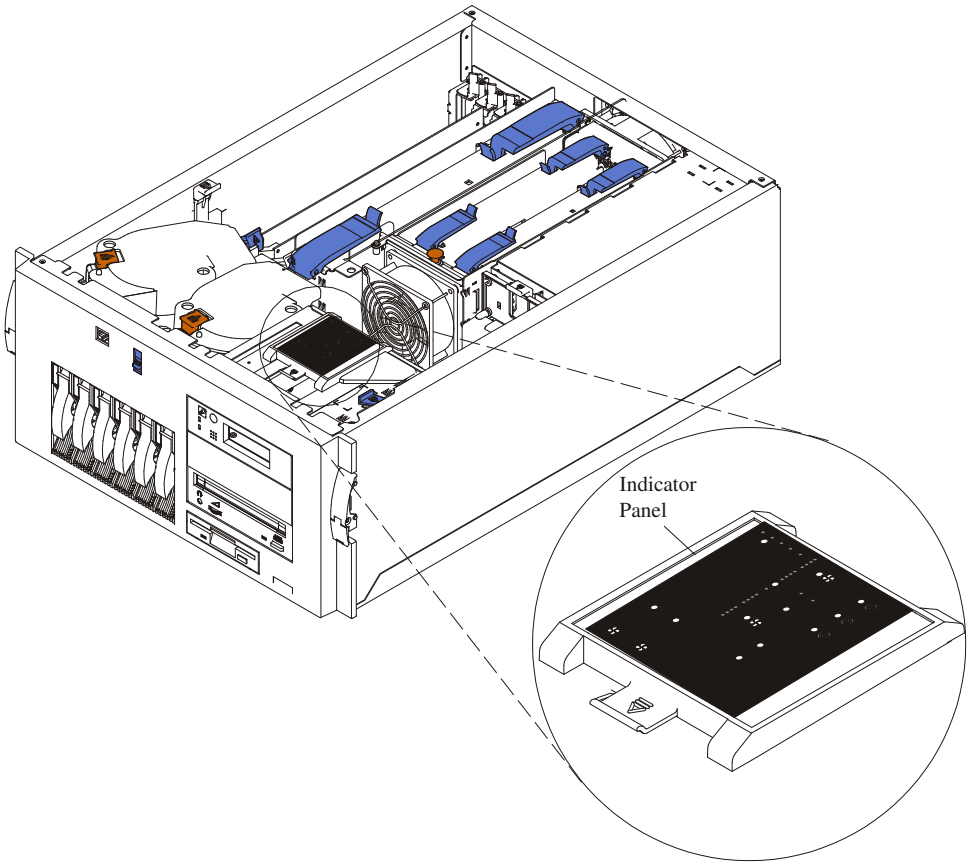
Go to Step 3 in "Problem Determination Using the Standalone or Online Diagnostics" on page 8-1. Otherwise, continue with this procedure.



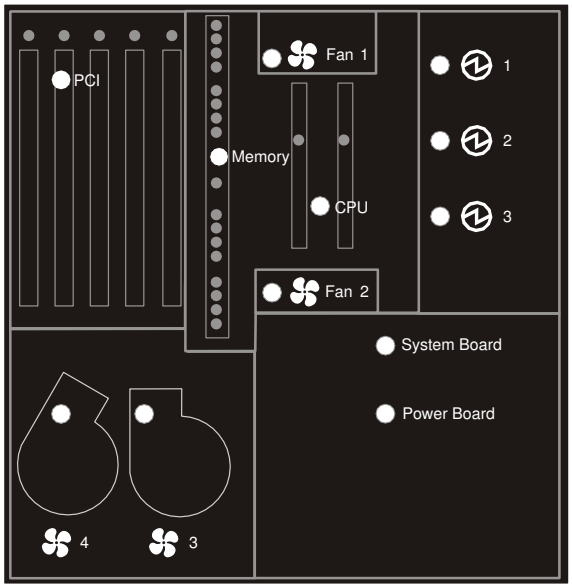
1	Power–on switch	**2**	Reset switch
3	Display	**4**	Attention LED
5	Power–on LED		

Indicator Panel

You can access the indicator panel without any tools. The panel provides enough information to identify the area that needs attention. The panel contains a group of amber LEDs that indicate which functional area of the system is experiencing the fault (such as Power, CPUs, Memory, Fans). If one of these LEDs is on, the user or service representative is directed to the physical area of the server where they will find an additional LED on, indicating that the component is responsible for the current fault.



The following illustration shows the LEDs on the indicator panel, located inside the server.



Component LEDs

In addition to the indicator panel or display, individual LEDs are located on or near the failing components. The LEDs are either on the component itself or on the carrier of the component (memory card, fan, memory module, CPU).

The LEDs are amber, except for the power supplies. For the power supplies, two green LEDs (AC Power Good and DC Power Good) indicate the fault condition for the power supply.

Reporting the Problem

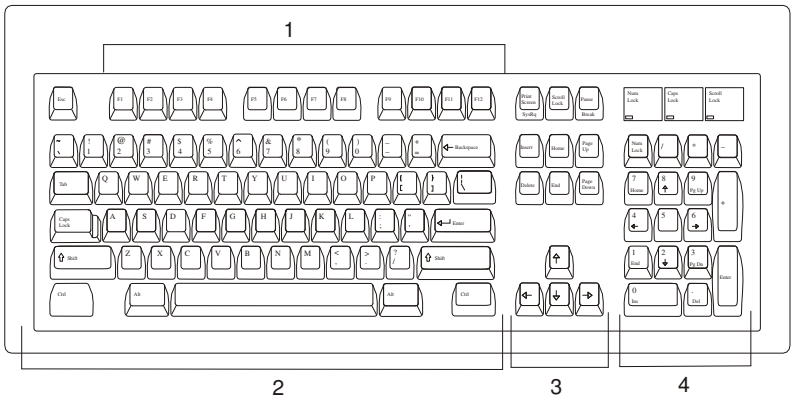
After you have determined which component is failing, report the problem.

1. Record the following information before calling for service:
   - Machine type and model
   - Server serial number
   - Any error codes that appear in the operator panel display or console
   - Any LEDs lit on the indicator panel
2. Call for service. You will be given the choice to replace the failing component yourself or have a service representative replace it. If you are replacing the failing component, go to Chapter 9: Repair Action for instructions.

Using the Keyboards

Several keyboards are available for the system unit. The keyboards have various keys that enter data and control the cursor location. The keyboards can be engraved for the languages of different countries.

The functions of each keyboard depends on the software used. The character sets for the keyboards are contained and explained in the documentation for your operating system.



The keyboard is divided into four sections:

1. Function keys are multipurpose keys, and their function is controlled by the operating system.
2. Typewriter keys are similar to those on a standard typewriter. Their function is controlled by the software.
3. Control keys move the cursor on the screen and do programmed control functions. The movement and functions depend on the application used.
4. Numeric keypad is arranged like a calculator to help when typing numbers.

All of the keyboards adjust for typing comfort. To tilt the keyboard, pull out the keyboard legs. The legs snap into position. To decrease the tilt of the keyboard, rotate the keyboard legs until they snap into the bottom of the keyboard case.

The keyboard cable plugs into the keyboard connector at the rear of the primary I/O drawer.

Using the Three–Button Mouse

The mouse is a hand–operated locating device. A three–button mouse is available for use with the system unit. Consult your application publication for the exact use of the three–button mouse.

You can use the mouse to perform such functions as positioning a cursor, selecting items from a menu, or moving around in your document much easier and faster than if you used only the keyboard. The cursor moves exactly as you move the mouse on a flat surface, such as a desktop.

When you move the mouse around on a flat surface, the cursor moves on the display screen; the movement changes the position of the cursor.

With the mouse buttons, you can perform functions such as selecting and deselecting options, extending your selection, or choosing a command. The precise function of your mouse depends on the software you are using.

The mouse has a cable that plugs into the mouse connector at the rear of the primary I/O drawer.

Handling the Mouse Correctly

For best operation, handle the mouse with care. Incorrect handling can damage the mouse.

Do not:

- Operate the mouse on cloth, unfinished wood, newspaper, or carpet
- Drop or hit the mouse
- Carry the mouse by holding onto the cable
- Expose the mouse to extreme temperatures or direct sunlight
- Place the mouse in liquid spills

Caring for the Mouse

Make sure that the operating surface for the mouse is smooth, clean, and flat. For example, you can operate the mouse on the following surfaces:

- Finished wood
- Glass
- Enamel
- Plastic
- Paper (except newspaper)
- Metal

Rough surfaces collect contaminants that can be transferred to the interior of the mouse by the ball. Rough surfaces can also cause the pads located on the bottom of the mouse to prematurely wear. A deeply pitted surface could cause erratic operation of the mouse. The surface you use should be free from spills, dirt, dust, lint, wax, eraser dust, and other foreign matter.

Additional things to check:

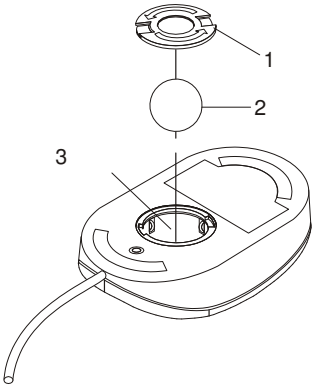
- Inspect the work surface for spills or other contaminants.

- Dust the work surface.
- If you are using a paper pad, inspect it for wear and replace it if necessary.

Cleaning the Mouse

To clean the mouse, do the following:

1. Remove the retaining ring (1) by turning it counterclockwise, in the direction of the arrow as shown in the illustration.



2. Remove the ball (2).
3. Inspect the ball for contaminants. Wipe it clean with a dry, lint–free cloth.
4. If the ball is dirty, wash it in warm, soapy water. Rinse and wipe the ball with a lint–free cloth until dry.
5. Inspect the ball cavity (3) in the mouse for foreign materials. If there are any foreign materials, remove them.
6. Replace the ball.
7. Replace the retaining ring on the mouse and align it with the open slots in the ball cavity.
8. Turn the retaining ring clockwise until the open slots are covered and you hear the ring snap into place.

Using the 3.5–Inch Diskette Drive

The 26M/8 has a 1.44MB diskette drive installed vertically in the front.

The 1.44MB diskette drive can format, read, and write diskettes compatible with the following diskettes:

- 1.0MB diskettes with 720KB formatted data capacity
- 2.0MB diskettes with 1.44MB formatted data capacity (HD)

Format the diskette according to its specified capacity.

Write–Protecting 3.5–Inch Diskettes

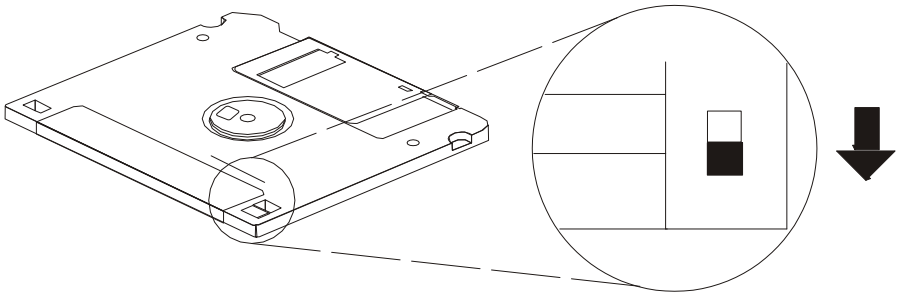
Write–protecting diskettes is necessary so that important information is not accidentally lost.

When diskettes are write–protected, you can read information from the diskettes, but you cannot write information onto them.

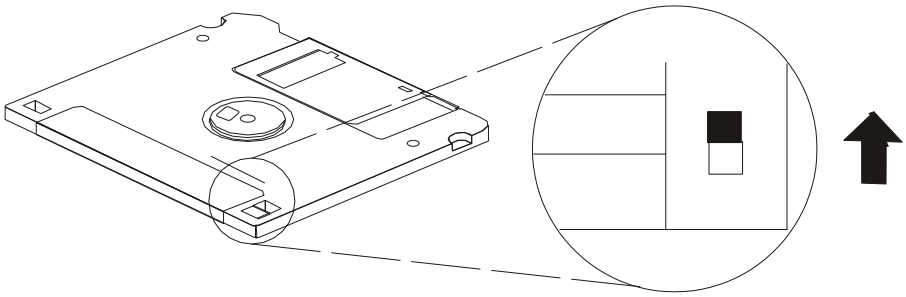
There is a write–protect tab on the 3.5–inch diskette.

To locate the write–protect tab, turn the diskette over with the label facing down.

- To prevent writing onto a diskette, slide the write–protect tab to open the protect slot, as shown in the following illustration.



- To allow writing onto a diskette, slide the write–protect tab to cover the protect slot, as shown in the following illustration.



Loading and Unloading the 3.5–Inch Diskette

To load a diskette into the drive, insert the diskette in the diskette drive with the labeled metal shutter first. Push the diskette into the drive until you hear a click. The click indicates that the diskette is securely in position in the drive.

To unload the diskette, push the diskette–unload button. The diskette unloads partially from the drive. Remove the diskette.

Using the CD–ROM Drive

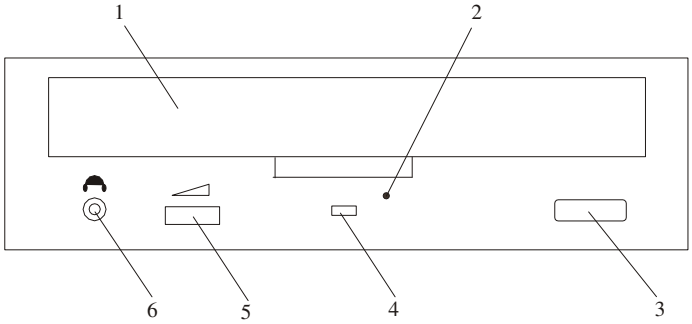
CAUTION:
A Class 1 laser is contained in the device. Do not attempt to operate the drive while it is disassembled. Do not attempt to open the covers of the drive, as it is not serviceable and is to be replaced as a unit.

This section describes the features of the 40X SCSI–2 CD–ROM drive and provides instructions for handling the drive and CD–ROM discs. The CD–ROM is a half–high, 5.25”, 8–bit, single–ended, tray–loading drive. Its features include the following:

- SCSI–2 interface supports both synchronous and asynchronous data transfer
- High–speed data transfer rate of 2100 KB per second (14X) at inner diameter and 4800 KB per second (32X) at outer diameter due to constant RPM spin rate
- High–speed synchronous burst rate of 10 MB per second
- Average random access time of 90 ms
- Loading tray accommodates both 8 cm discs (in the horizontal orientation only) and 12 cm discs
- Reads multi–session discs
- Reads CD–recordable discs
- Reads CD–RW discs
- Supports all major CD–ROM formats: Mode 1, Mode 2, XA, CDDA, and audio

- Headphone output and line output for audio

Front View of CD–ROM Drive



1	Compact disk tray	**4**	Status light
2	Emergency eject hole	**5**	Volume control
3	Load/Unload button	**6**	Headphone jack

Understanding the Status Lights

The status lights indicate the operational status of the drive. The various conditions are as follows:

If light is:	**Condition is:**
Off	Drive is in standby mode with or without a disc loaded.
Blinking (green)	Any of the following: • Drive tray is inserted. The light blinks while the drive completes the initialization checkout. • Drive is reading data. The light blinks while data is being read. • Drive is in Play Audio Mode. The light blinks while the audio is playing.
On (amber)	Hardware error condition found during initialization. **Note:** If this occurs, contact your service representative.

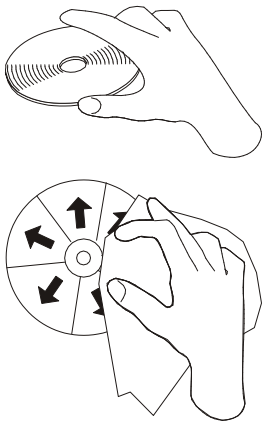
Handling Compact Discs

Compact discs are high–density media that must be handled with care and kept clean to ensure that they remain readable.

Use the following precautions to ensure reliability:

- Hold the compact disc by the edges. Do not touch the surface of the compact disc.

- To remove dust or fingerprints, wipe the compact disc from the center to the outside of the compact disc as shown, using a lint–free cloth.



Attention: Wiping the compact disc in a circular direction can cause loss of data.

- Do not write on the surface.
- Do not store or place the compact disc in direct sunlight.
- Do not use benzene, thinners, or other cleaners to clean the compact disc.
- Do not bend the compact disc.

Other Handling Considerations

Be sure to take the following additional precautions when you use the CD–ROM drive:

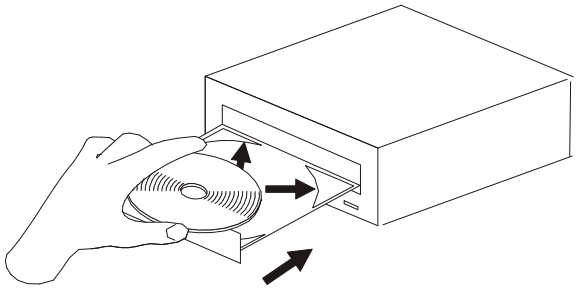
- Remove compact discs from the tray before you move the drive anywhere.
- Do not place the drive where any of the following conditions exist:
  - High temperature
  - High humidity
  - Excessive dust
  - Excessive vibration or sudden shock
  - Inclined surface
  - Direct sunlight
- Do not insert foreign objects into the drive.
- Do not remove the drive covers or attempt to service the drive yourself.

Loading a Compact Disc

To load a compact disc into the drive, do the following:

1. Press the Load/Unload button to open the tray. The tray slides out of the drive.
2. Place the compact disc in the tray with the label facing up.

3. Press the Load/Unload button, or gently push in the tray, to close the tray.



Note: Be sure that none of the vertical retaining tabs are extended when you use the drive in the horizontal position.

Opening the Tray Manually

The compact disc tray automatically opens when you press the Load/Unload button. If it does not automatically open, follow these steps to force it open manually:

1. Shut down and turn off the power to your system.
2. Insert the straightened end of a paper clip into the emergency eject hole until you feel some resistance. See “Front View of CD–ROM Drive” on page 2-8 if you are not sure where the emergency eject hole is located.
3. Continue to push in the paper clip while you pull out the tray with your fingernail.
4. Pull the tray completely open and remove the disc. It is normal for the tray to make a clicking sound while you are pulling it open.

Playing an Audio CD

To play an audio CD, you must have headphones connected to the headphone jack located on the front of the drive, or connected to the line–out connector located on the back of the system. You must also have an audio software application installed.

The headphone jack provides the connection for headphones using a 3.5–mm (1/8”) stereo mini–plug. The volume control adjusts the audio output level for the headphones.

Using the Service Processor Features

The service processor features protects users against unnecessary system downtime by keeping support personnel (both internal and external) aware of any unexpected changes in the system environment. In combination, the feature provides a flexible solution to automated system maintenance.

The service processor runs on its own power boundary and continually monitors hardware attributes, the AIX operating system, and the environmental conditions within the system. Any system failure which prevents the system from returning to an operational state (a fully functional AIX operating system) is reported by the service processor. The service processor is controlled by firmware and does not require the AIX operating system to be operational to perform its tasks. If any system failures are detected, the service processor has the ability to take predetermined corrective actions. The methods of corrective actions are:

- Surveillance
- Call Home
- AIX operating system monitoring

Surveillance is a function in which the service processor monitors the system through heartbeat communication with the system firmware. The heartbeat is a periodic signal that

the firmware can monitor. During system startup, the firmware surveillance monitor is automatically enabled to check for heartbeats from the firmware. If a heartbeat is not detected within a default period, the service processor cycles the system power and attempts to restart until the system either restarts successfully, or a predetermined retry threshold is reached. In the event the service processor is unsuccessful in bringing the system online (or in the event that the user asked to be alerted to any service processor–assisted restarts), the system can call home to report the error.

The call home function can be initialized to call either a service center telephone number, a customer administration center, or a digital pager telephone number. The service processor can be configured to stop at the first successful call to any of the numbers listed, or can be configured to call every number provided. If connected to the service center, the service processor transmits the relevant system information (the system's serial number and model type) and service request number (SRN). If connected to a digital pager service, the service processor inputs a customer voice telephone number defined by the customer. An established sequence of digits or the telephone number to a phone near the failed system could be used to signal a system administrator to a potential system failure.

During normal operations, the service processor can also be configured to monitor the AIX operating system. If AIX does not respond to the service processor heartbeat, the service processor assumes the operating system is hung. The service processor can automatically initiate a restart and, if enabled, initiate the call home function to alert the appropriate parties to the system hang. Enabling operating system surveillance also affords AIX the means to detect any service processor failures.

The service processor cannot be configured in a client/server environment where one system can be used to manage all dial–out functionally for a set of systems.

Chapter 3. Using the Service Processor

The service processor menus make it possible for you to configure service processor options, as well as enable and disable functions.

Service processor menus are available using an ASCII terminal when the server is turned off and the service processor is operating with standby power. Service processor menus are also available when server power is on and the service processor has detected a server problem (such as surveillance failure).

During the first power–on (that is, the power cord is plugged into the outlet), service processor menus are not available for 45 seconds while the service processor is running self–tests and initializing the server. If the server powers off, service processor menus become available after 15 seconds.

The following table contains a summary of the service processor functions and the methods for invoking them.

SP Functions

Service Processor Functions	Service Processor Menus (ASCII terminals)	AIX Service Aids (ASCII or graphics terminals)	SMS (ASCII or graphics terminals)
View System Evironmental Conditions	Y[3]		
Read System POST Errors	Y[3]		
Read Service Processor Error Logs	Y[3]		
View Progress Indicators from last Boot	Y[3]		
Power–on System	Y[3]		
Power–off System	Y[2]		
Read NVRAM	Y[2]		
Reset Service Processor	Y[2]		
Setup Reboot/Restart Policy	Y[2]		
Start Talk Mode	Y[2]		
Enable/Disable Console Mirroring	Y[2]	Y[1]	
Select Modem Line Speed	Y[2]	Y[1]	
Enable/Disable Modem	Y[2]	Y[1]	
Setup Modem Configuration	Y[2]	Y[1]	
Setup Ring Indicate Power–On	Y[2]	Y[1]	
Setup Dial–out Phone Numbers	Y[2]	Y[1]	
Setup Surveillance	Y[2]	Y[1]	
Update Service Processor Flash EPROM	Y[2]	Y[1]	Y[2]
Change General Access Password	Y[2]		Y[2]
Change Privileged Access Password	Y[2]		Y[2]
Select Language	Y[2]		Y[2]
Enable/Disable Unattended Start Mode	Y[2]		Y[2]

Passwords required (if set):

[1] Operating system root password
[2] Privileged access password
[3] General access (power–on) password

Service Processor Menus

The service processor menus are divided into two groups:

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

This section describes these menus, how to access them, and the functions associated with each option within the menus.

If the server is powered off, the service processor menus can be accessed locally or remotely.

Service Processor Menu Inactivity

To prevent loss of control in unstable power environments, the service processor leaves the menu mode after five minutes of inactivity. Return to the menus by pressing any key on the local or remote terminal.

Accessing the Service Processor Menus Locally

Service processor menus can be accessed locally by connecting an ASCII terminal to either serial port 1 (S1) or serial port 2 (S2). The service processor menus cannot be accessed on serial port 3 (S3). Because the presence of the ASCII terminal cannot be confirmed by the service processor, you must press a key on the ASCII terminal to confirm its presence. After `OK` displays on the operator panel the service processor prompts you for a password (if set), and when verified, displays the service processor menus.

Accessing the Service Processor Menus Remotely

Service processor menus can be accessed remotely by connecting a modem to serial port 1 or serial port 2, as follows:

1. Turn off the system, unplug the power cord, and press the Power button to drain capacitance while power is disconnected.
2. Connect the modem to the appropriate serial port and turn on the modem.
3. Plug in the system.

Notes:

1. If your modem has not been configured, go to “Call–In/Call–Out Setup Menu” on page 3-16. With a terminal or terminal emulator, call the system’s modem.
2. The service processor prompts you for a password (if set), and when verified, displays the service processor menus.

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 you use this service aid 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 “Introducing Tasks and Service Aids” section of the “*Diagnostic Information for Multiple Bus Systems*”, order number 86 A1 26HX.

General User Menu

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, to access this menu.

```
+-------------------------------------------------------------------------------+
|                                                                               |
|          GENERAL USER MENU                                                    |
|                                                                               |
|    1. Power-on System                                                         |
|                                                                               |
|    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                                                 |
|                                                                               |
|    6. View System Environmental Conditions                                    |
|                                                                               |
|   99. Exit from Menus                                                         |
|                                                                               |
|   1                                                                           |
+-------------------------------------------------------------------------------+
```

Note: The service processor prompt displays either 1> or 2> to indicate which serial port on the system is being used to communicate with the service processor.

- **Power–on System**

  Allows the user to power on the system.

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

  Displays manufacturer vital product data, such as serial numbers, part numbers, and so on, 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 (checkpoints), up to a maximum of 100, from the system boot prior to the one in progress. This historical information can be useful to help diagnose system faults.

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

  The progress indicator codes are listed from top (latest) to bottom (oldest). The dashed line represents the point where the latest boot started.

  If the <— arrow occurs, use the 4–digit checkpoint or 8–digit error code being pointed to as the starting point for your service actions.

- **Read Service Processor Error Logs**

  Displays the service processor error logs.

  The time stamp in this error log is coordinated universal time (UTC), also known as Greenwich mean time (GMT). AIX error logs have additional information available and are able to time stamp the errors with local time. See ”Service Processor Error Logs” on page 3-28 for an example of the error log.

- **Read System POST Errors**

  This option should only be used by service personnel to display additional error log information.

- **View System Environmental Conditions**

  With this menu option, the service processor reads all environmental sensors and reports the results to the user. This option can be useful when surveillance fails, because it allows the user to determine the environmental conditions that may be related to the failure.

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 (optional)

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

System name, an optional field, is the name that 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 following Main Menu illustration is example information only.

```
+------------------------------------------------------------------------------+
|                                                                              |
|          Service Processor Firmware                                          |
|          VERSION: MM000313                                                   |
|          Copyright 1999 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                                                         |
|                                                                              |
|  1                                                                           |
+------------------------------------------------------------------------------+
```

- **Service Processor Setup Menu**

  See "Service Processor Setup Menu", on page 3-6 for more information.

- **System Power Control Menu**

  See "System Power Control Menu", on page 3-9 for more information

- **System Information Menu**

  See "System Information Menu", on page 3-13 for more information.

- **Language Selection Menu**

  See "Language Selection Menu", on page 3-16 for more information.

- **Call–In/Call–Out Setup Menu**

  See ”Call–In/Call–Out Setup Menu”, on page 3-16 for more information.

- **Set System Name**

  Allows setting of the system name.

Service Processor Setup Menu

The Service Processor Setup menu shown below is accessed from the Main Menu:

```
+-------------------------------------------------------------------------------+
|                                                                               |
|          SERVICE PROCESSOR SETUP MENU                                         |
|                                                                               |
|    1. Change Privileged Access Password                                       |
|                                                                               |
|    2. Change General Access Password                                          |
|                                                                               |
|    3. Enable/Disable Console Mirroring:                                       |
|             Currently Disabled                                                |
|                                                                               |
|    4. Start Talk Mode                                                         |
|                                                                               |
|    5. OS Surveillance Setup Menu                                              |
|                                                                               |
|    6. Reset Service Processor                                                 |
|                                                                               |
|    7. Reprogram Service Processor Flash EPROM                                 |
|                                                                               |
|    8. Serial Port Snoop Setup Menu                                            |
|                                                                               |
|   98. Return to Previous Menu                                                 |
|                                                                               |
|   99. Exit from Menus                                                         |
|                                                                               |
|   1                                                                           |
+-------------------------------------------------------------------------------+
```

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 eight alphanumeric characters. You can enter longer passwords, but the entries are truncated to include only the first eight characters. The Privileged Access Password can be set from Service Processor menus or from System Management Services (SMS) utilities (see Chapter 4, ”Using System Management Services). The General Access Password can be set only from Service Processor menus.

For security purposes, the service processor 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 (through a modem). The error threshold is three attempts.

If the error threshold is reached by someone entering passwords at the system, the Service Processor exits the menus. This action is taken based on the assumption that the system 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, Service Processor disconnects the modem to prevent potential security attacks on the server by unauthorized remote users.

The following table illustrates what you can access with the Privileged Access Password and the General Access Password.

Privileged Access Password	General Access Password	Resulting Menu
None	None	MAIN MENU displays
None	Set	MAIN MENU displays
Set	None	Users with the password see the MAIN MENU
Set	Set	Users see menus associated with the entered password

- **Change Privileged Access Password**

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

- **Change General Access Password**

  Set or change the General Access Password. It provides limited access to service processor menus, and is usually available to all users who are allowed to power on the system.

- **Enable/Disable Console Mirroring**

  When console mirroring is enabled, the service processor sends information to both serial ports. This capability, which can be enabled by local or remote users, provides local users with the capability to monitor remote sessions. Console mirroring can be enabled for the current session only.. For more information, see ”Console Mirroring”, on page 3-27.

- **Start Talk Mode**

  In a console–mirroring session, it is useful for those who 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 menu can be used to set up operating system (OS) surveillance.

```
+------------------------------------------------------------------------------+
|                                                                              |
|         OS Surveillance Setup Menu                                           |
|                                                                              |
|   1. Surveillance:                                                           |
|        Currently Enabled                                                     |
|                                                                              |
|   2. Surveillance Time Interval:                                             |
|        5 minutes                                                             |
|                                                                              |
|   3. Surveillance Delay:                                                     |
|        10 minutes                                                            |
|                                                                              |
|                                                                              |
|  98. Return to Previous Menu                                                 |
|                                                                              |
|  1                                                                           |
+------------------------------------------------------------------------------+
```

  – **Surveillance**

  Can be set to Enabled or Disabled.

  – **Surveillance Time Interval**

  Can be set to any number from 1 through 255 minutes. The default value is 5 minutes.

  – **Surveillance Delay**

  Can be set to any number from 0 through 255 minutes. The default value of 10 minutes is the recommended minimum.

  Surveillance Time Interval and Surveillance Delay can only be changed after surveillance is enabled. Refer to ”Service Processor System Monitoring – Surveillance”, on page 3-25 for more information about surveillance.

- **Reset Service Processor**

  Allows the user to reinitialize the service processor.

- **Reprogram Flash EPROM Menu**

  Attention: Only the service processor firmware can be updated from the service processor menus; the system firmware cannot be updated from the service processor menus. A service processor firmware update always requires a companion system firmware update, which must be applied first. For this reason, updating only the service processor firmware using the service processor menus is not recommended. Contact your service support representative to obtain the latest firmware levels and update instructions.

  The service processor firmware update image must be written onto a DOS–formatted diskette. Contact your service support representative to obtain the latest firmware update image and update instructions.

  After the update diskette has been made, from the service processor main menu, select **Service Processor Setup**. Then select **Reprogram Service Processor Flash EPROM**. The program requests the update diskette(s) as they are needed. The service processor will automatically reboot after the firmware update is complete.

Serial Port Snoop Setup Menu

This menu can be used to set up Serial Port Snooping, in which the user can configure serial port 1 as a ”catch–all” reset device.

From the Service Processor Main Menu, select option 1, Service Processor setup menu, then select option 8 (Serial Port Snoop Setup Menu).

```
+------------------------------------------------------------------------------+
|                                                                              |
|          SERIAL PORT SNOOP SETUP MENU                                        |
|                                                                              |
|    1. System reset string:                                                   |
|         Currently Unassigned                                                 |
|                                                                              |
|    2. Snoop Serial Port:                                                     |
|        Currently Unassigned                                                  |
|                                                                              |
|   98. Return to Previous Menu                                                |
|                                                                              |
|1>                                                                            |
+------------------------------------------------------------------------------+
```

Use the system reset string option to enter the system reset string, which resets the machine when it is detected on the main console on Serial Port 1.

Use the Snoop Serial Port option to select the Serial Port to Snoop.

Note: Only Serial Port 1 is supported.

After serial port snooping is correctly configured, at any point after the system is booted to AIX, whenever the reset string is typed on the main console, the system uses the service processor reboot policy to restart. This action causes an early power off warning (EPOW) to be logged, and also an AIX dump to be created if the machine is at an AIX prompt, with AIX in such a state that it can respond. If AIX cannot respond, the EPOW record is created, rather than the AIX dump.

Pressing Enter after the reset string is not required, so make sure that the string is not common or trivial. A mixed–case string is recommended.

System Power Control Menu

This menu is used to set power control options. Other menus that control boot options are available here:

```
+------------------------------------------------------------------------------+
|                                                                              |
|          SYSTEM POWER CONTROL MENU                                           |
|                                                                              |
|    1. Enable/Disable Unattended Start Mode:                                  |
|          Currently Disabled                                                  |
|                                                                              |
|    2. Ring Indicate Power-On Menu                                            |
|                                                                              |
|    3. Reboot/Restart Policy Setup Menu                                       |
|                                                                              |
|    4. Power-On System                                                        |
|                                                                              |
|    5. Power-Off System                                                       |
|                                                                              |
|    6. Enable/Disable Fast System Boot                                        |
|          Currently Disabled                                                  |
|                                                                              |
|    7. Boot Mode Menu                                                         |
|                                                                              |
|   98. Return to Previous Menu                                                |
|                                                                              |
|   99. Exit from Menus                                                        |
|                                                                              |
|   1                                                                          |
+------------------------------------------------------------------------------+
```

- **Enable/Disable Unattended Start Mode**

  Use this option to instruct the service processor to immediately power–on the server after a power failure, bypassing power–on password verification. Unattended start mode can be used on systems that require automatic power–on after a power failure. Unattended start mode can also be set using SMS menus.

- **Ring Indicate Power–On Menu**

Ring indicate power–on is an alternate method of dialing in without establishing a service processor session. If the system is powered off and ring indicate power–on is enabled, the system is powered on at the predetermined number of rings. If the system is already on, no action is taken. In either case, the telephone call is not answered. The caller receives no feedback that the system is powered on. The **Ring Indicate Power–On Menu** and defaults are as follows:

```
+------------------------------------------------------------------------------+
|                                                                              |
|         RING INDICATE POWER-ON MENU                                          |
|                                                                              |
|   1. Ring indicate power-on :                                                |
|       Currently Disabled                                                     |
|                                                                              |
|   2. Number of rings:                                                        |
|       Currently  6                                                           |
|                                                                              |
|  98. Return to Previous Menu                                                 |
|                                                                              |
+------------------------------------------------------------------------------+
```

The number of rings can be set to any number greater than zero. The default value is six rings..

- **Reboot/Restart Policy Setup Menu**

The following menu controls Reboot/Restart Policy:

```
+------------------------------------------------------------------------------+
|                                                                              |
|         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                                                 |
|                                                                              |
|  1                                                                           |
+------------------------------------------------------------------------------+
```

Reboot describes bringing the system hardware back up from scratch, for example, from a system reset or power–on. The reboot process ends when control passes to the operating system loading (or initialization) process.

Restart describes activating the operating system after the system hardware reinitialized. Restart must follow a successful reboot.

– **Number of reboot attempts** – If the system fails to successfully complete the boot process, it attempts to reboot the number of times specified. 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 to react or not react in 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 can 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 system 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:

. The **Use OS–Defined restart policy** is set to NO.

OR

. The **Use OS–Defined restart policy** is set to YES, and the operating system has NO automatic restart policy.

Refer to ”Service Processor Reboot/Restart Recovery”, on page 3-23.

– **Call–Out before restart** – If a restart is necessary due to a system fault, you can enable the service processor to call out and report the event. This option can be valuable if the number of these events becomes excessive, signalling a bigger problem.

The following table describes the relationship among the operating system and service processor restart controls:

OS AUtomatic Rebbot/Restart After-Crash Setting	Service Processor to Use OS–Defined Restart Policy?	Service Processor Enable Supplemental Restart Policy?	System Response
None	No	No[1]	
None	No	Yes	Restarts
None	Yes[1]	No[1]	
None	Yes[1]	Yes	Restarts
False[2]	No	No[1]	
False[2]	No	Yes	Restarts
False[2]	Yes[1]	No[1]	
False[2]	Yes[1]	Yes	
True	No	No[1]	
True	No	Yes	Restarts
True	Yes[1]	No[1]	Restarts
True	Yes[1]	Yes	Restarts

1 Service processor default

2 AIX default

- **Power–On System**

  Allows immediate power–on of the system. For other power–on methods, see ”System Power–Om Methods”, on page 3-22.

- **Power–Off System**

  Allows the user to power–off the server following a surveillance failure.

- **Enable/Disable Fast System Boot**

  Allows the user to select a fast system boot.

  Attention: Enabling fast system boot results in several diagnostic tests being skipped and a shorter memory test being run.

- **Boot Mode Menu**

  Allows users to set the system to automatically start a specific function on the next system start. This setting applies to the next boot only and is reset to the default state of being disabled following a successful boot attempt.

```
+------------------------------------------------------------------------------+
|                                                                              |
|          Boot Mode Menu                                                      |
|                                                                              |
|    1. Boot to SMS Menu:                                                      |
|         Currently Disabled                                                   |
|                                                                              |
|    2. Service Mode Boot from Saved List:                                     |
|         Currently Disabled                                                   |
|                                                                              |
|    3. Service Mode Boot from Default List:                                   |
|         Currently Disabled                                                   |
|                                                                              |
|    4. Boot to Open Firmware Prompt:                                          |
|         Currently Disabled                                                   |
|                                                                              |
|   98. Return to Previous Menu                                                |
|                                                                              |
|   1                                                                          |
+------------------------------------------------------------------------------+
```

  – Enabling the Boot to SMS Menu option

  Causes the system to automatically stop at the System Management Services menu during the boot process. Enabling this option is equivalent to pressing 1 on the attached ASCII terminal (or F1 on a graphics terminal) while the system initialization indicators display on screen.

  – Enabling the Service Mode Boot from Saved List option

  This selection causes the system to boot from the saved service mode boot list (saved in NVRAM). This is normally used to try to boot Customer Diagnostics from the CD–ROM drive. If the system boots AIX from the disk drive and AIX diagnostics are loaded on the disk drive, AIX boots to the diagnostics menu.

  Using this option to boot the system is the preferred way to run Online diagnostics.

  – Enabling the Service Mode Boot from Default List option

  This selection is similar to ”Service Mode Boot from Saved List”, except the system boots from the default boot list that is stored in the system firmware. This is normally used to try to boot customer diagnostics from the CD–ROM drive.

  Using this option to boot the system is the preferred way to run Standalone diagnostics.

  – Enabling the Boot to Open Firmware Prompt option

  Causes the system to automatically enter open firmware prompt (also called the OK prompt). This option should only be used by service personnel to obtain additional debug information.

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

  The user can also override the choices in the Boot Mode Menu while the system initialization indicators display on the screen. For example, if the user had enabled the system to enter the SMS menus (option 1) but pressed the 8 key while the system initialization indicators displayed on the screen, the system would enter the open firmware prompt and disregards the settings in the Boot Mode Menu.

System Information Menu

This menu provides access to system configuration information, error logs, system resources, and processor configuration.

```
+-------------------------------------------------------------------------------+
|                                                                               |
|          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                                                              |
|                                                                               |
|    6. Read Service Processor Configuration                                    |
|                                                                               |
|    7. View System Environmental Conditions                                    |
|                                                                               |
|    8. Processor Configuration/Deconfiguration Menu                            |
|                                                                               |
|    9. Memory Configuration/Deconfiguration Menu                               |
|                                                                               |
|    10. Enable/Disable CPU Repeat Gard                                         |
|        Currently Enabled                                                      |
|                                                                               |
|    11. Enable/Diable MEM Repeat Gard                                          |
|        Currently Enabled                                                      |
|                                                                               |
|    12. Query/Modify Attention Indicator                                       |
|                                                                               |
|                                                                               |
|                                                                               |
|   98. Return to Previous Menu                                                 |
|                                                                               |
|   99. Exit from Menus                                                         |
|                                                                               |
|   1                                                                           |
+-------------------------------------------------------------------------------+
```

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

  Displays manufacturer's vital product data (VPD), such as serial numbers, part numbers, and so on, 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 (checkpoints), up to a maximum of 100, from the system boot prior to the one in progress. This historical information can help to diagnose system faults.

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

  The progress indicator codes are listed from top (latest) to bottom (oldest). If the <—— arrow occurs, use the 4–digit checkpoint or 8–character error code being pointed to as the beginning of your service actions.

- **Read Service Processor Error Logs**

  Displays error conditions detected by the service processor.

  The time stamp in this error log is coordinated universal time (UTC), also known as Greenwich mean time (GMT). AIX error logs have additional information available and are able to time stamp the errors with the local time.Refer to "Service Processor Error Logs", on page 3-28 for an example of this error log.

- **Read System POST Errors**

  This option should only be used by service personnel to display additional error log information.

- **Read NVRAM**

  Displays 320 bytes of Non Volatile Random Access Memory (NVRAM) content.

- **Read Service Processor Configuration**

  Displays all service processor settings that can be changed by the user.

- **View System Environmental Conditions**

  The service processor reads all environmental sensors and reports the results to the user. Use this option when surveillance fails, because it allows the user to determine the environmental conditions that may be related to the failure.

- **Processor Configuration/Deconfiguration Menu**

  Use this option to view the processor configuration.

  The following is an example of the Processor Configuration/Deconfiguration Menu:

```
+-------------------------------------------------------------------------------+
|                                                                               |
|         PROCESSOR CONFIGURATION/DECONFIGURATION MENU                          |
|                                                                               |
|  Processor Number                                                             |
|                                                                               |
|   0.  Configured by system (0x0)                                              |
|   2.  Configured by system (0x0)                                              |
|                                                                               |
|  98. Return to Previous Menu                                                  |
|                                                                               |
|                                                                               |
|  To change the configuration, select the processor number                     |
|  1                                                                            |
+-------------------------------------------------------------------------------+
```

The processor can be in one of the following states:

- **Configured by system**: The system processor is present, and has not exceeded the failure threshold.
- **Deconfigured by system**: The system processor has been taken offline by the service processor due to an unrecoverable error, or recoverable errors exceeding the failure threshold.

Note: A status of (0x0) indicates that the processor card has not had any errors logged against it by the service processor.

Attention: If the system processor in slot 1 (P1–C1) has been deconfigured by the system, the service processor will prevent the system from booting.

- **Memory Configuration/Deconfiguration Menu**

  Use this menu to view and modify the dual inline memory module (DIMM) configuration. If it is necessary to take one of the memory DIMMs offline, this menu allows you to deconfigure a DIMM and then reconfigure the DIMM at a later time.

  The configuration process takes place during system power–on. Therefore, the configuration displayed by this menu in standby mode reflects the configuration during the last boot.

  The following is an example of the Memory Configuration/Deconfiguration Menu.

```
+-------------------------------------------------------------------------------+
|                                                                               |
|         MEMORY CONFIGURATION/DECONFIGURATION MENU                             |
|                                                                               |
|  DIMMs on memory card number 0:                                               |
|                                                                               |
|   1. Configured by system (0x0            2. Configured by system (0x0        |
|   3. Configured by system (0x0            4. Configured by system (0x0        |
|                                                                               |
|  98. Return to Previous Menu                                                  |
|                                                                               |
|  Enter card number and DIMM number separated by a space                       |
|  1>                                                                           |
|                                                                               |
+-------------------------------------------------------------------------------+
```

In this system, the memory card number is 0 by default.

When the user selects a DIMM, its state toggles between configured and deconfigured. Memory DIMMs that are not present are not shown.

Each memory DIMM can be in one of following states:

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

Note: A status of (0x0) indicates that the memory DIMM has not had any errors logged against it by the service processor.

- **Enable/Disable CPU Repeat Gard Menu**

  Use this option to enable or disable CPU repeat gard.

- **Enable/Disable Memory Repeat Gard Menu**

  Use this option to enable or disable memory repeat gard.

- **Query/Modify Attention IndicatorQuery/Modify Attention Indicator**: (amber colored LED located on the operator panel) This option allows the user to query and modify the system fault/system identify LED. This LED displays the state of the attention indicator sensors.

  If this option is chosen, the following screen is displayed:

```
+------------------------------------------------------------------------------+
|                                                                              |
|  Do you wish to:                                                             |
|                                                                              |
|   1.  MAke the rack/system indicator blink/reset the state                   |
|   2.  Clear all light path LEDs                                              |
|                                                                              |
|  98. Return to Previous Menu                                                 |
|                                                                              |
|                                                                              |
|  1>                                                                          |
+------------------------------------------------------------------------------+
```

  If option 1 is chosen, the rack indicator/system attention LED can be set or reset (turned on or off).

  If option 2 is chosen, the LEDs on the light path LED panel can be cleared (turned off).

  Note: The system fault/system identify LED can also be set and reset using tasks in the AIX Service Aids.

Language Selection Menu

The service processor menus and messages are available in different languages. This menu allows selecting languages in which the service processor and system firmware menus and messages are displayed.

```
+------------------------------------------------------------------------------+
|                                                                              |
|          LANGUAGE SELECTION MENU                                             |
|                                                                              |
|    1. English                                                                |
|                                                                              |
|    2. Francais                                                               |
|                                                                              |
|    3. Deutsch                                                                |
|                                                                              |
|    4. Italiano                                                               |
|                                                                              |
|    5. Espanol                                                                |
|                                                                              |
|    6. Svenska                                                                |
|                                                                              |
|   98. Return to Previous Menu                                                |
|                                                                              |
|   99. Exit from Menus                                                        |
|                                                                              |
|   1                                                                          |
+------------------------------------------------------------------------------+
```

Note: Your ASCII terminal must support the ISO–8859 character set to correctly display languages other than English.

Call–In/Call–Out Setup Menu

This menu is used to configure a modem for the service processor to use to support the system:

```
+------------------------------------------------------------------------------+
|                                                                              |
|          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                                                          |
|                                                                              |
|    8. Ring Indicate Power-on Menu                                            |
|                                                                              |
|   98. Return to Previous Menu                                                |
|                                                                              |
|   99. Exit from Menus                                                        |
|                                                                              |
|   1                                                                          |
+------------------------------------------------------------------------------+
```

- **Modem Configuration Menu**, see ”Modem Configuration Menu” on page 3-17.
- **Serial Port Selection Menu**, see ”Serial Port Selection Menu” on page 3-17.
- **Serial Port Speed Setup Menu**, see ”Serial Port Speed Setup Menu” on page 3-18.
- **Telephone Number Setup Menu**, see ”Telephone Number Setup Menu” on page 3-18.
- **Call–Out Policy Setup Menu**, see ”Call–Out Policy Setup Menu” on page 3-19.
- **Customer Account Setup Menu**, see ”Customer Account Setup Menu” on page 3-20.
- **Call–Out Test Menu**, see “Call–Out Policy Setup Menu” on page 3-19.
- **Ring Indicate Power–On Menu**, see page 3-10.

Modem Configuration Menu

Entries at the top of the Modem Configuration Menu display the status of the current selections. Selections are made in the 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. 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 “Modem Configurations”, on page C-1.

```
+------------------------------------------------------------------------------+
|                                                                              |
|          Modem Configuration Menu                                            |
|                                                                              |
|    Port 1 Modem Configuration File Name:                                     |
|    Port 2 Modem Configuration File Name:                                     |
|                                                                              |
|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                  7. modem_z_sp                                    |
|    4. modem_f_sp            8. modem_z0_sp                                   |
|    5. modem_f0_sp           9. modem_m0_sp                                   |
|    6. modem_f1_sp          10. modem_m1_sp                                   |
|                                                                              |
|   30. Save configuration to NVRAM and Configure modem                        |
|   98. Return to Previous Menu                                                |
|                                                                              |
+------------------------------------------------------------------------------+
```

Serial Port Selection Menu

This menu allows you to enable and/or disable the call–in and call–out functions of each serial port in any combination.

```
+------------------------------------------------------------------------------+
|                                                                              |
|          Serial Port Selection Menu                                          |
|                                                                              |
|    1. Serial Port 1 Call-Out:          3. Serial Port 1 Call-In:             |
|        Currently Disabled                  Currently Disabled                |
|                                                                              |
|    2. Serial Port 2 Call-Out:          4. Serial Port 2 Call-In:             |
|        Currently Disabled                  Currently Disabled                |
|                                                                              |
|   98. Return to Previous Menu                                                |
|                                                                              |
+------------------------------------------------------------------------------+
```

Serial Port Speed Setup Menu

This menu allows you to set serial port speed to enhance terminal performance or to accommodate modem capabilities.

```
+-------------------------------------------------------------------------------+
|                                                                               |
|         Serial Port Speed Setup Menu                                          |
|                                                                               |
|   1. Serial Port 1 Speed:                                                     |
|         Currently 9600                                                        |
|                                                                               |
|   2. Serial Port 2 Speed:                                                     |
|         Currently 9600                                                        |
|                                                                               |
|  98. Return to Previous Menu                                                  |
|                                                                               |
|  1                                                                            |
+-------------------------------------------------------------------------------+
```

A serial port 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

Use this menu to set or change the telephone numbers for reporting a system failure.

```
+-------------------------------------------------------------------------------+
|                                                                               |
|         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                                                  |
|                                                                               |
|  1                                                                            |
+-------------------------------------------------------------------------------+
```

- **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 SP 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.
- **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, use a test number here. You can change it later when testing is complete.

Notes:

a. At least one of the preceding three telephone numbers must be assigned in order for the call–out test to execute successfully.

b. Some modems are not designed for the paging function. Although they can be used for paging, they 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 causes 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.

For digital pagers that require a personal identification number (PIN) for access, include the PIN in this field as shown in the following example:

```
18001234567,,,,87654
```

The commas create pauses for the voice response system, and the 87654 represents the PIN. The length of these pauses is set in modem register S8. The default is usually 1 or 2 seconds each.

- **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

Callout settings can be set using the following 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                                                  |
|                                                                               |
|  1                                                                            |
+-------------------------------------------------------------------------------+
```

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

  a. Service Center

  b. Customer Admin Center

  c. Pager

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

  a. Service Center

  b. Customer Admin Center

c. 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. The default values are as follows:

Remote timeout 120 seconds

Remote latency 2 seconds

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

Customer Account Setup Menu

This menu allows users to enter information that is specific to their account.

```
+-------------------------------------------------------------------------------+
|                                                                               |
|         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                                                  |
|                                                                               |
|  1                                                                            |
+-------------------------------------------------------------------------------+
```

- **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.

Call–Out Test

The call–out test verifies if the call–out function is working properly. Before the test, call–out must be enabled and the system configured properly for call–out.

During the setup, the user should have entered the phone numbers for the digital pager and customer voice for test purposes. These numbers are used to determine whether call–out is working during the call–out test.

The call–out test should cause the user's phone to ring. If the test is successful, call–out is working properly. The user should now change the test digital pager and customers voice number to the correct numbers.

Service Processor Functions

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

The Service Processor supports the following functions:

Built–in Functions	Initialization and Test	SP Basic Instructions Test (BIST)
		JTAG System Chip Initialization
	Error Data Collection	BIST/POST errors and status
		Checkstop FIR data logout
		Machine check logout
	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 (Service Processor)
		Error data (system)
		Environmental data
	Service Processor Setup Utilities	Passwords
		Phone numbers
		Language (NLS) selection
		Call–In/Call–Out enable/disable
		Flash (Gold/Recovery block) Update
		Flash (Composite block) Update
		System Name
		Modem Configuration
Remote User Functions	Call–Out (Call Home) Reporting	Boot failure
		OS Termination
		Surveillance failure
		Critical EPOW reporting
		Checkstop
		Machine check
	Identify System by name	Call–In
		Power–on via ring–indicate
		Password/security check
		Console mirroring/Quick disconnect

System Power–On Methods

This section discusses the following system power–on methods:

- Power–on switch
- Remote power–on by 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 six rings.

  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 by ring indicate signal and the service processor detects a battery failure, the service processor causes the system to power off. See “Service Processor Call–In Security” on page 3-23 for more information

- Unattended start mode – refer to **Enable/Disable Unattended Start Mode** on page 3-9.

  The service processor can be enabled to recover from the loss of ac power (see Enable/Disable Unattended Power–On Mode in the “System Power Control Menu” on page 3-9). When ac power is restored, the system returns to the 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.

- 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 AIX **shutdown –t** command for details on setting the timer.

  Note: If an ac power loss is in progress when the timed power–on attempt occurs, the server cannot power on when ac power is restored.

- Follow–up to a failed boot attempt

  The service processor initiates a power–on sequence if a failed boot attempt is detected (due to a hardware or software failure).

- Fast/Slow Boot (IPL) Capabilities

  Using the service processor menus, you can select the IPL type, mode, and speed of your system. For more information, refer to “System Power Control Menu” on page 3-9.

  Attention: Selecting fast IPL results in several diagnostic tests being skipped, and a shorter memory test being run.

Service Processor Call–In Security

If the service processor detects bad battery–powered storage (indicating that the battery on the system board has failed or has been removed), 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 to AIX.

After 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 service processor menus. See “Serial Port Selection Menu” on page 3-17.

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 started, which gives the POST an opportunity to locate and report any problems.

Failure During Boot Process

During the boot process, either initially after system power–on or upon reboot after a system failure, the Service Processor monitors the boot progress. If progress stops, the Service Processor can reinitiate the boot process (reboot) if enabled to do so. Service Processor can re–attempt this process according to 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 Service Processor can monitor operating system activity (see the SERVICE PROCESSOR SETUP MENU item Set Surveillance Parameters on page 3-5). If OS activity stops due to a hardware or software induced failure, the Service Processor can initiate a reboot/restart process based on the settings in the Service Processor Reboot/Restart Policy Setup Menu and the OS automatic restart settings (see OS documentation).

If the operating system is AIX, the menu item under SMIT for setting the restart policy is Automatically Reboot After Crash (True/False), and the default is False. When the setting is True, and if the Service Processor parameter ”Use OS–Defined Restart Policy” is Yes (the default), 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 Service Processor can be instructed to refer to that policy, or not, by the Use OS–Defined Restart Policy menu item.

Processor Boot–Time Deconfiguration (CPU Repeat Gard)

Processor boot time deconfiguration allows for the removal of processors from the system configuration at boot time. The objective is to minimize system failure or data integrity exposure due to a faulty processor.

This function uses processor hardware built–in self–test (BIST) and firmware power–on self–test (POST) to discover and isolate processor hardware failures during boot time. It also uses the hardware error detection logic in the processor to capture run–time recoverable and irrecoverable error indications. The firmware uses the error signatures in the hardware to analyze and isolate the error to a specific processor.

The processors that are deconfigured remain offline for subsequent reboots until the faulty processor hardware is replaced.

This function allows users to manually deconfigure or re–enable a previously deconfigured processor through the service processor menu. The user can also enable or disable this function through the service processor.

Memory Boot–Time Deconfiguration (Memory Repeat Gard)

Memory boot–time deconfiguration allows for the removal of a memory segment or DIMM from the system configuration at boot time. The objective is to minimize system failures or data integrity exposure due to faulty memory hardware. The hardware resource(s) to be removed are the ones that experienced the following failures:

- A boot–time test failure
- Run–time recoverable errors over the error threshold prior to the current boot phase
- Run–time irrecoverable errors prior to the current boot phase

This function uses firmware power–on self–test (POST) to discover and isolate memory hardware failures during boot time. It also uses the hardware error detection logic in the memory controller to capture run–time recoverable and irrecoverable errors. The firmware uses the error signatures in the hardware to analyze and isolate the error to the specific memory segment or DIMM.

The memory segment or DIMM that is deconfigured remains offline during subsequent reboots until the faulty memory hardware is replaced.

The function allows users to manually deconfigure or re–enable a previously deconfigured memory segment/DIMM through the service processor menu. The user can also enable or disable this function through the service processor menu.

Service Processor System Monitoring – Surveillance

Surveillance is a function in which the Service Processor (SP) monitors the system, and the system monitors the SP. This monitoring is accomplished by periodic samplings called *heartbeats*.

Surveillance is available during two phases:

1. System firmware bringup (automatic)
2. Operating system runtime (optional).

System Firmware Surveillance

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 by the user, and the surveillance interval and surveillance delay cannot be changed by the user.

If the service processor detects no heartbeats during system boot (for a set period of time), it cycles the system power to attempt a reboot. The maximum number of retries is set from the service processor menus. If the failure condition repeats, the service processor leaves the machine powered on, logs an error, and displays 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

Operating system surveillance provides the service processor with a means to detect hang conditions, as well as hardware or software failures, while the operating system is running. It also provides the operating system with a means to detect a service processor failure caused 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 SP option.

You can also use the service processor menus and the AIX diagnostic service aids to enable or disable operating system surveillance.

For operating system surveillance to work correctly, you must set the following parameters:

- Surveillance enable/disable
- Surveillance interval

  The maximum time (in minutes) the SP will wait between heartbeats from the operating system before reporting a surveillance failure.

- Surveillance delay

  The maximum time (in minutes) the SP will wait for the first heartbeat from the operating system after the operating system has been startted, before reporting a surveillance failure.

Surveillance takes effect immediately after the parameters are set from the service processor menus.

If operating system surveillance is enabled (and system firmware has passed control to the operating system), and the service processor does not detect any heartbeats from the operating system within the surveillance delay period, the service processor assumes the system is hung. The machine is left powered on and the service processor enters standby phase, displaying the operating system surveillance failure code on the operator panel. If call–out is enabled, the service processor calls to report the failure.

Call–Out

The SP 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)
- Critical environmental failures
- Restarts

To enable the call–out feature, you need to do the following:

1. Have a modem connected to serial port 1 (S1) or serial port 2 (S2).
2. Set up the following using the Service Processor Menus or Diagnostic Service Aids:
   - Enable call–out for the serial port where the modem is connected.
   - Set the serial port line speed.
   - 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 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 user on a local ASCII terminal to monitor the service processor activities of a remote user. Console mirroring ends when the service processor releases control of the serial ports to the system firmware.

System Configuration for Console Mirroring

The following describes the configuration for console mirroring:

- 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.

Remote console mirroring can be invoked in two ways:

- Remote session first, then local session added:
  a. Remote session already in progress.
  b. Remote user uses SP menus to enable console mirroring, allowing both consoles to be active.
- Local session first, then remote session added:
  a. Local session is already in progress.
  b. The SP receives a call from the remote user.
  c. The local user selects the option to enable console mirroring. SP immediately begins mirroring SP menus.

Note: To disconnect quickly, press Ctrl+D on either console, and both sessions will exit the service processor menus.

Service Processor Firmware Updates

Attention: Only the service processor firmware can be updated from the service processor menus; the system firmware cannot be updated from the service processor menus. A service processor firmware update always requires a companion system firmware update, which must be applied first. For this reason, updating only the service processor firmware using the service processor menus is not recommended. Contact your service support representative to obtain the latest firmware levels and update instructions.

The service processor firmware update image must be written onto a DOS–formatted diskette. Contact your service support representative to obtain the latest firmware update image and update instructions.

After the update diskette has been made, from the service processor main menu, select **Service Processor Setup**. Then select **Reprogram Service Processor Flash EPROM**. The program requests the update diskette(s) as they are needed. The service processor will automatically reboot after the firmware update is complete.

Service Processor Error Log

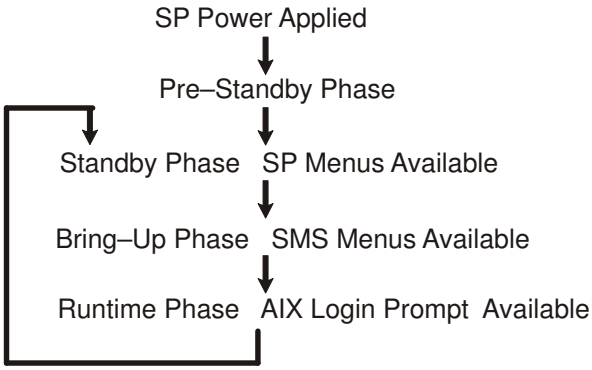
The service processor error log contains information about errors reported by the service processor.

```
+------------------------------------------------------------------------------+
|                                                                              |
|         Error Log                                                            |
|                                                                              |
|   19991118165344  1. 4B276851 CPU BIST fail detected                         |
|   FRUs to replace: P1-C1                                                     |
|                                                                              |
|                                                                              |
|  Press "C" to clear error log, any other key to continue.  >                 |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+
```

The time stamp in this error log is coordinated universal time (UTC), also known as Greenwich mean time (GMT). AIX error logs have more information available and are able to time stamp with local time.

Service Processor Operational Phases

This section provides a high–level flow of the phases of the Service Processor (SP).



Pre–Standby Phase

This phase is entered when the server is connected to a power source. The server may or may not be fully powered on. This phase is exited when the Power–On Self–Tests (POSTs) and configurations tasks are completed.

The Pre–Standby phase components are:

- Service Processor Initialization – Service Processor performs any necessary hardware and software initializations.
- Service Processor POST – Service Processor conducts Power–On Self–Tests on its various work and code areas.
- Service Processor Unattended Start Mode Checks – To assist fault recovery. If unattended start mode is set, the Service Processor automatically reboots the server. Service Processor does not wait for user input or power–on command, but moves through the phase and into the Bring–Up Phase. Access SMS menus or Service Processor menus to reset the unattended start mode.

Standby Phase

The standby phase can be reached in either of two ways:

- With the server off and power connected (the normal path), recognized by `OK` in the LCD display.

  OR

- With the server on after an operating system fault, recognized by an 8–digit code in the LCD display.

In the Standby phase, the SP takes care of some automatic duties and is available for menus operation. The SP remains in the standby phase until a power–on request is detected.

The Standby phase components are as follows:

- Modem Configuration

  Service Processor configures the modem (if installed) so that incoming calls can be received, or outgoing calls can be placed.

- Dial In

  Monitor incoming phone line to answer calls, prompt for a password, verify the password, and remotely display the standby menu. The remote session can be mirrored on the local ASCII console if the server is so equipped and the user enables this function.

- Menus

  The Service Processor menus are password–protected. Before you can access them, you need either General User (Power–On Password or POP) or Privileged User (Privileged Access Password or PAP).

Bring–Up Phase

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

The bring–up phase components are as follows:

- Retry Request Check

  The Service Processor checks to see if the previous boot attempt failed. If the specified number of failures are detected, the SP displays an error code and places an outgoing call to notify an external party if the user has enabled this option.

- Dial Out

  The Service Processor can dial a preprogrammed telephone number in the event of an IPL failure. The Service Processor issues an error report with the last reported IPL status indicated and any other available error information.

- Update Operator Panel

  The Service Processor displays Operator Panel data on the ASCII terminal if a terminal is connected either locally or remotely.

- Environmental Monitoring

  The Service Processor provides expanded error recording and reporting.

- System Firmware Surveillance (Heartbeat Monitoring)

  The SP monitors and times the interval between system firmware heartbeats.

- Responding to System Processor Commands

  The SP responds to any command issued by the system processor.

Runtime Phase

This phase includes the tasks that the SP performs during steady–state execution of the operating system.

- Environmental Monitoring

  The SP monitors voltages, temperatures, and fan speeds (on some servers).

- Responding to System Processor Commands

  The SP responds to any command issued by the system processor.

- Run–Time Surveillance (Heartbeat Monitoring)

  If the device driver is installed and surveillance enabled, the Service Processor monitors the system heartbeat. If the heartbeat times out, the Service Processor places an outgoing call. This is different from the bring–up phase scenario, where the specified number of reboot attempts are made before placing an outgoing call.

Service Processor Procedures in Service Mode

When the system is in service mode, the following service processor parameters are suspended:

- Unattended start mode
- Reboot/restart policy
- Call–Out
- Surveillance

When service mode is exited, the service processor parameters revert to the customer settings.

Chapter 4. Using System Management Services

System Management Services

The System Management Services make it possible for you to view information about your computer and to perform such tasks as setting passwords and changing device configurations.

If you have chosen a graphical display as your system console, you can use the graphical System Management Services described below. If you are using an ASCII display as your system console, see ”Text–Based System Management Services” on page 4-20.

Graphical System Management Services

To start the Open Firmware command line or graphical System Management Services, turn on or restart the computer.

The firmware version installed in your system unit is displayed at the bottom right–handed corner of the initial logo screen. Please note the version number; processor upgrades may require a specified version of firmware to be installed in your system unit. (**Update System Firmware** is an option under the Utilities menu in the System Management Services).

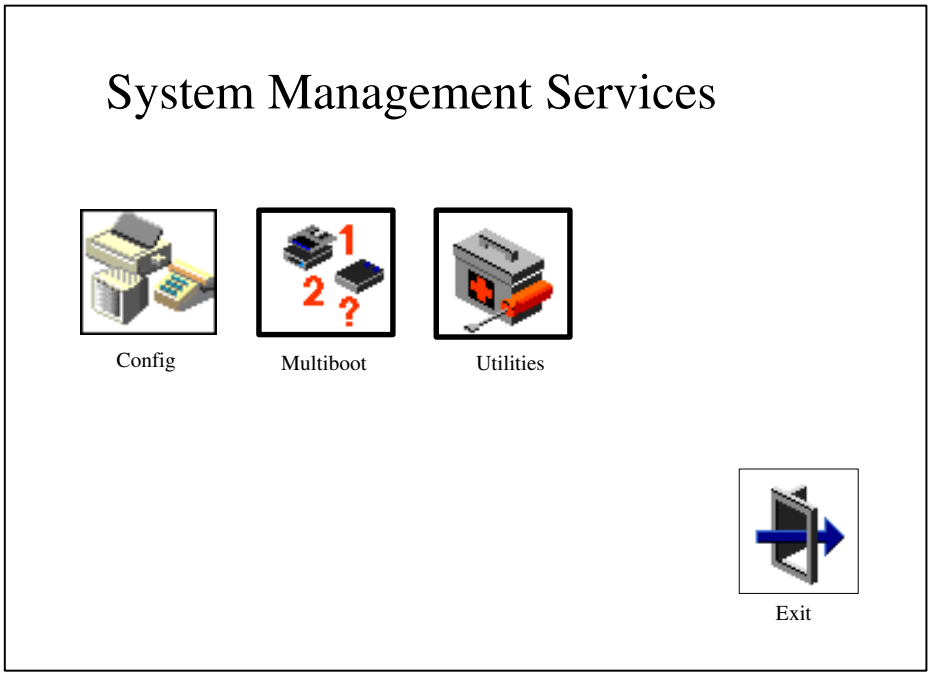
After the logo is displayed, initialization icons appear across the bottom of the screen.

To enter the graphical System Management Services, you must press the **F1** key *after the keyboard icon appears* during startup.

If you have pressed the **F1** key, the System Management Services appears after the initialization and power–on self test (POST) are complete.

Note: If you have installed a privileged–access password, you will be prompted for this password before gaining access to the System Management Services menu.

After the System Management Services starts, the following screen appears.

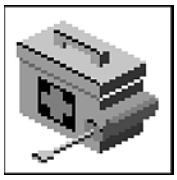


You can also press F8 here to enter the open firmware OK> prompt. This should only be done by service personnel to obtain additional debug information.

The System Management Services screen contains the following choices.

Config: Enables you to view your system setup. Go to “Config” on page 4-4.

MultiBoot: Enables you to set and view the default operating system, modify the boot sequence, access the Open Firmware command prompt, and other options. Go to “Multiboot” on page 4-5.



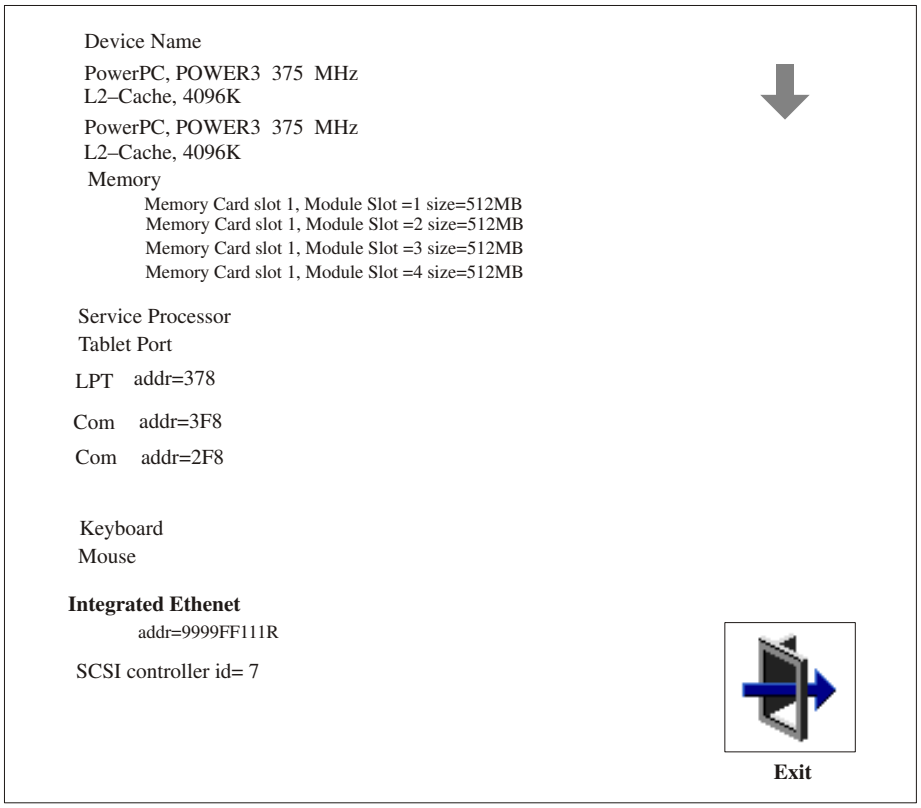
Utilities: Enables you to set and remove passwords, control the playing of system tones, enable the unattended start mode, set and view the addresses of your system’s SCSI controllers, select the active console, view or clear the error log, and update your system unit’s firmware program. Go to “Utilities” on page 4-7.

Exit: Returns you to the previous screen.

To select an icon, move the cursor with the arrow keys to choose which icon is highlighted, then press the **Enter** key. You can also select an icon by clicking on it with your left mouse button. To leave the current screen, elther press the **Esc** key or select the **Exit** icon.

Config

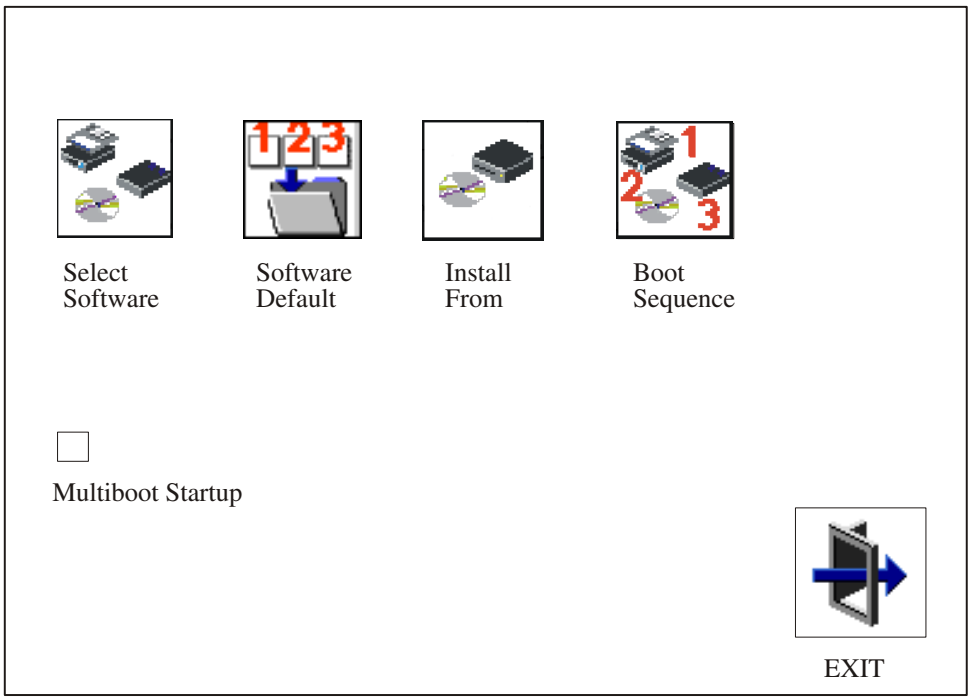
Selecting this icon makes it possible for you to view information about the setup of your system unit. A list similar to the following appears when you select the **Config** icon.



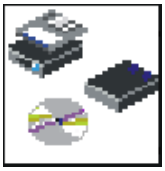
If more than one screen of information is available, a blue arrow in the top right corner of the screen appears. Use the Page Up and Page Down keys to scroll through the pages.

MultiBoot

The options available from this screen allow you to view and set various options regarding the operating system and boot sequence.



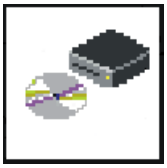
The following describes the choices available on this screen.



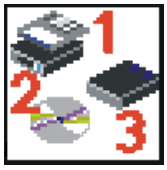
Select Software: This option, if supported by the operating system, allows you to choose which operating system to use. Choosing an operating system causes the system to start.This option is supported by AIX. However, not all operating systems support this option..

If you receive an informational message saying that no operating system is installed, then the system information in non–volatile storage may have been lost. This can happen if the battery has been removed. To correct this situation, refer to the **bootlist** command in your AIX operating system documentation.

Software Default: This option, if supported by the operating system, enables you to select an operating system as the default operating system for your system unit.



Install From: Enables you to select a media drive from which to install an operating system. Selection of a device is done using the spacebar.



Boot Sequence: Enables you to view and change the custom boot list (the sequence in which devices are searched for operating system code). You may choose from 1 to 5 devices for the custom boot list.

The default boot sequence is:

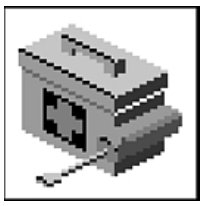
3. Diskette drive.
4. CD-ROM drive.
5. Tape drive.
6. Hard disk drive.
7. Network device.

To change the custom boot list, enter a new order in the **New** column, then click on the Save icon. The list of boot devices is updated to reflect the new order.

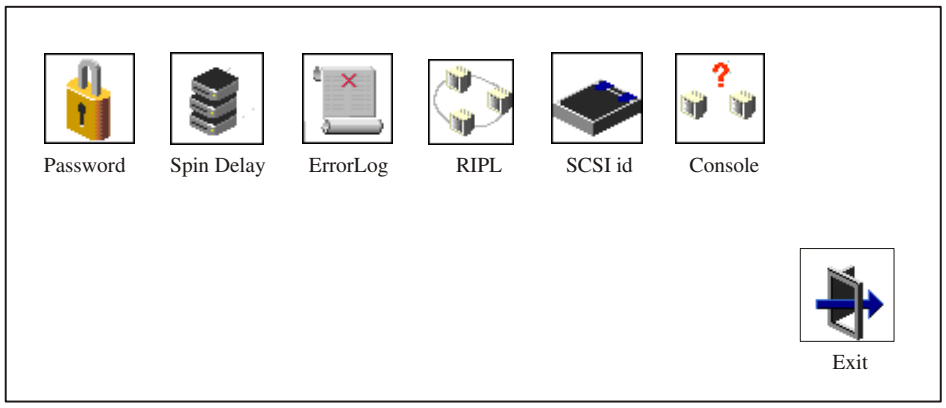
ATTENTION: To change the custom boot list back to the default values, click on Default. If you change your startup sequence, you must be extremely careful when performing write operations (for example, copying, saving, or formatting). You can accidentally overwrite data or programs if you select the wrong drive.

Multiboot Startup: Clicking on this button toggles whether the Multiboot menu appears automatically at startup.

Utilities

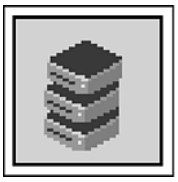


Selecting this icon enables you to perform various tasks and view additional information about your system unit.



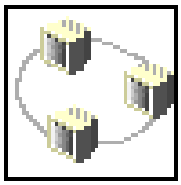
The following describes the choices available on this screen.

Password: Enables you to set password protection for turning on the system unit and for using system administration tools. Go to “Password” on page 4-9.

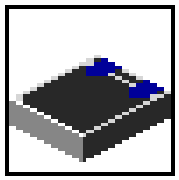


Spin Delay: Enables you to change the spin up delay for SCSI hard disk drives attached to your system. Go to “Spin Delay” on page 4-12.

Error Log: Enables you to view and clear error log information for your system unit. Go to “Error Log” on page 4-13.



RIPL (Remote Initial Program Load): Allows you to select a remote system from which to load programs via a network adapter when your system unit is first turned on. This option also allows you to confiture network adapters which require setup. Go to “RIPL” on page 4-14.

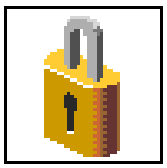


SCSI–ID: Allows you to view and change the addresses (IDs) of the SCSI controllers attached to your system unit. Go to “SCSI ID” on page 4-18.

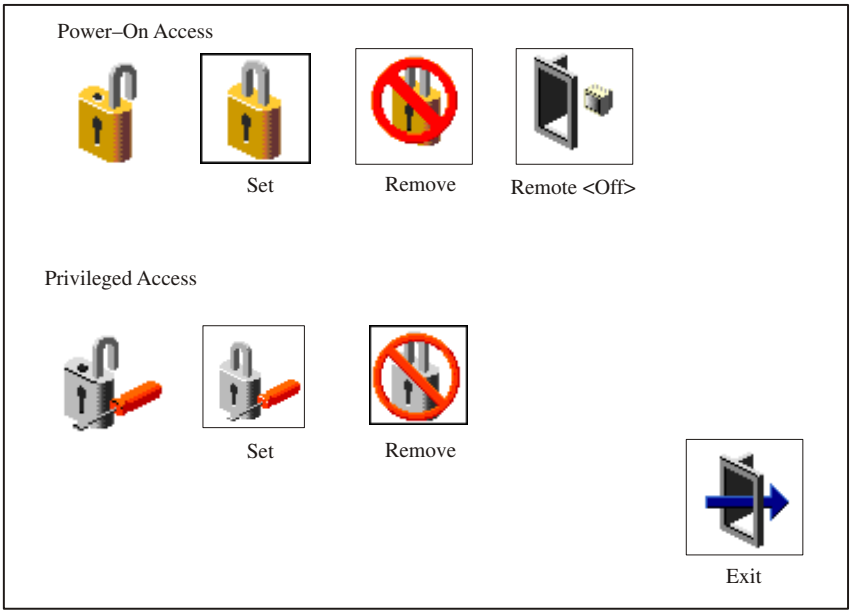
Console: Allows the user to select which console to use to display the SMS menus. The selection is only for the SMS menus. It does not affect the display used by the AIX operating system.

Follow the instructions that display on the screen. Pressing the number 1 key after the keyboard icon appears and before the tone returns you to SMS.

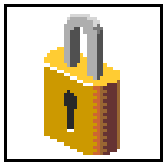
Password



When you select this icon, the following screen is displayed.

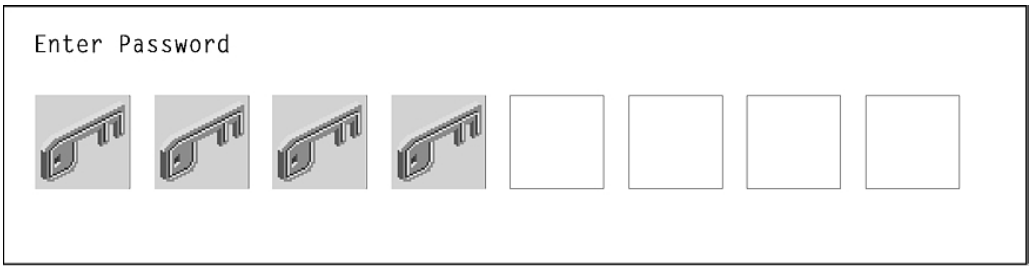


Power–On Access Password

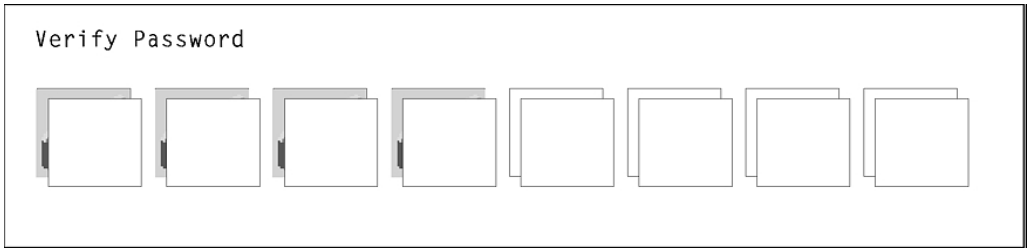


Power–On Password: Setting a **power–on access** password helps protect information stored in your system unit. If a power–on password is set for your system unit, the Power–On status icon is shown in the locked position; if a power–on password is not set, then the Power–On status icon is shown in the unlocked position (as in the screen above).

When you select the **Set** icon, a screen with 8 empty boxes appears. Type your password in these boxes. You can use any combination of up to eight characters (A–Z, a–z, and 0–9) for your password. As you type a character, a key appears in the box.



Press **Enter** when you are finished; you must type the password again for verification.



If you make a mistake, press the **Esc** key and start again.

If the two password entries do not match, an error icon appears with the error code `20E00000`.

Note: After you have entered and verified the password, the power–on password status icon flashes and changes to the locked position to indicate that the power–on password is installed.

If you previously had set a power–on password and want to remove it, select the **Remove** icon.

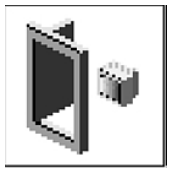
After you have selected the remove icon, the power–on–access status icon flashes and changes to the unlocked position to indicate that the power–on–access password is not set.

Note: If you forget the power–on access password, you can erase the password by shutting down the system unit and removing the battery for at least 30 seconds. The system unit power cable must be disconnected before removing the battery.

A password becomes effective only after the system is turned off and back on again.

Attention: If no user–defined bootlist exists and the power–on–access password has been enabled, you are asked for the power–on–access password at startup every time you boot your system.

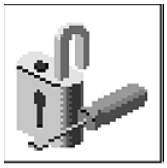
Remote Mode



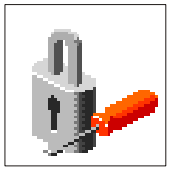
Remote Mode: The remote mode, when enabled, allows the system to start from the defined boot device. This mode is ideal for network servers and other system units that operate unattended. You *must* set a power–on password before you can enable the remote mode. When the remote mode is set, the icon changes to **Remote <On>**.

Note: To use the remote mode feature for booting unattended devices, you must enable the unattended start mode. See the “System Power Control Menu” on a page 3-9 for instructions on enabling the unattended start mode, which allows the system unit to turn on whenever ac power is applied to the system (instead of having the system unit wait for the power button to be pushed).

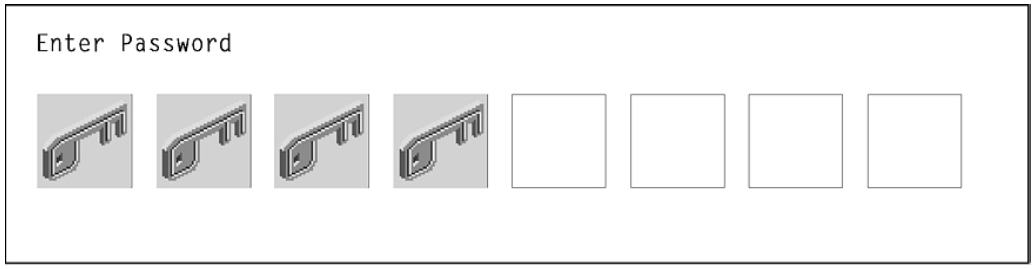
Privileged –Access Password



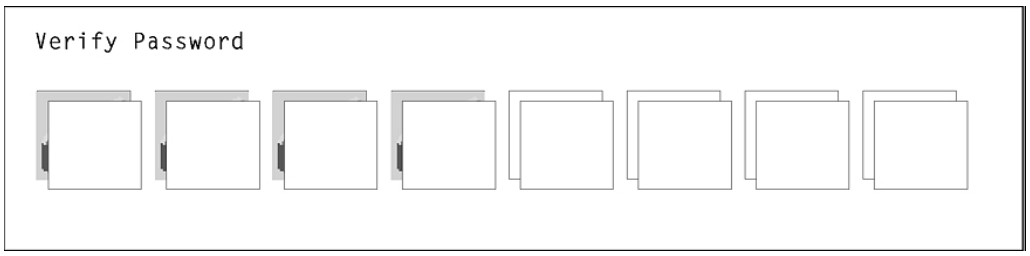
Privileged–Access Password: The privileged–access password protects against the unauthorized starting of the system programs. Select the **Set** icon to set and verify the privileged–access password.



When you select the **Set** icon, a screen with 8 empty boxes appears. Type your password in these boxes. You can use any combination of up to eight characters (A–Z, a–z, and 0–9) for your password. As you type a character, a key appears in the box.



Press **Enter** when you are finished; you must type the password again for verification.

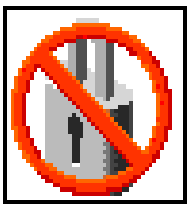


If you make a mistake, press the **Esc** key and start again.

If the two password entries do not match, an error icon appears with the error code `20E00001`.

Note: After you have entered and verified the password, the privileged–access password icon flashes and changes to the locked position to indicate that your system unit now requires the password you just entered before running system programs.

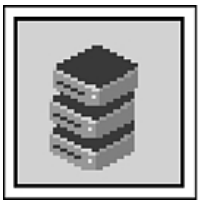
If you previously had set a privileged–access password and want to remove it, select the **Remove** icon.



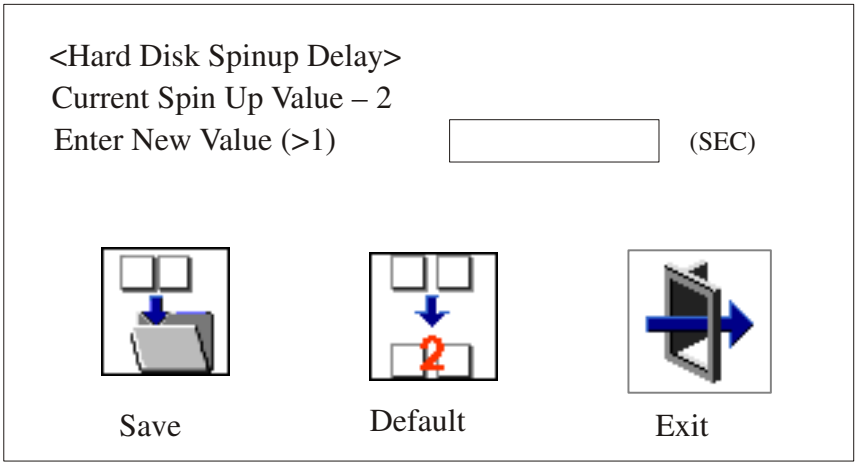
After you have selected the **Remove** icon, the privileged–access status icon flashes and changes to the unlocked position to indicate that the privileged–access password is not set.

Attention: If no user–defined bootlist exists and the privileged–access password has been enabled, you are asked for the privileged–access password at startup every time you boot your system

Spin Delay

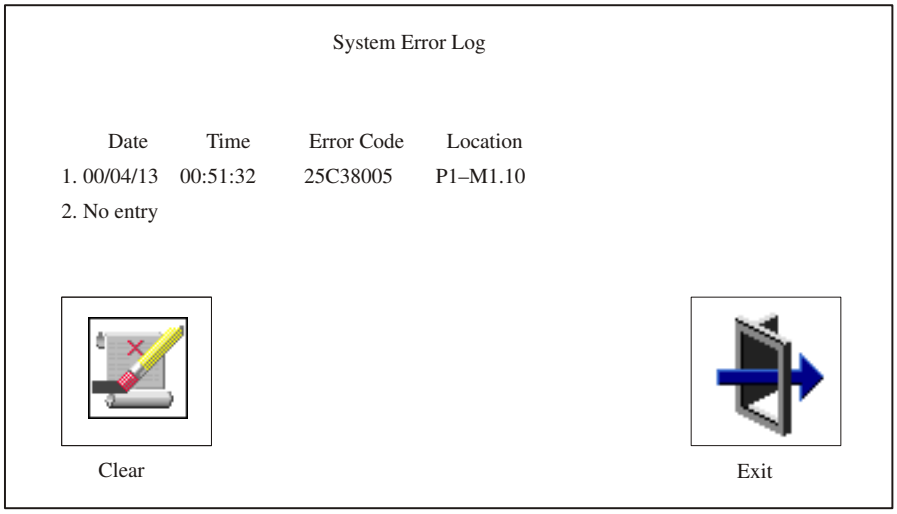


This selection allows you to change the spin up delay for SCSI hard disk drives attached to your system. Spin up delay values can be entered manually or a default setting can be used. All values are measured in seconds. The default is two seconds. After you have entered the new Spin up delay values, use the arrow keys to highlight the **Save** icon and press the Enter key.



Error Log

Selecting this icon displays the log of errors your system unit has encountered during operations.

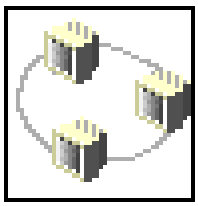


Selecting the **Clear** icon erases the entries in this log.

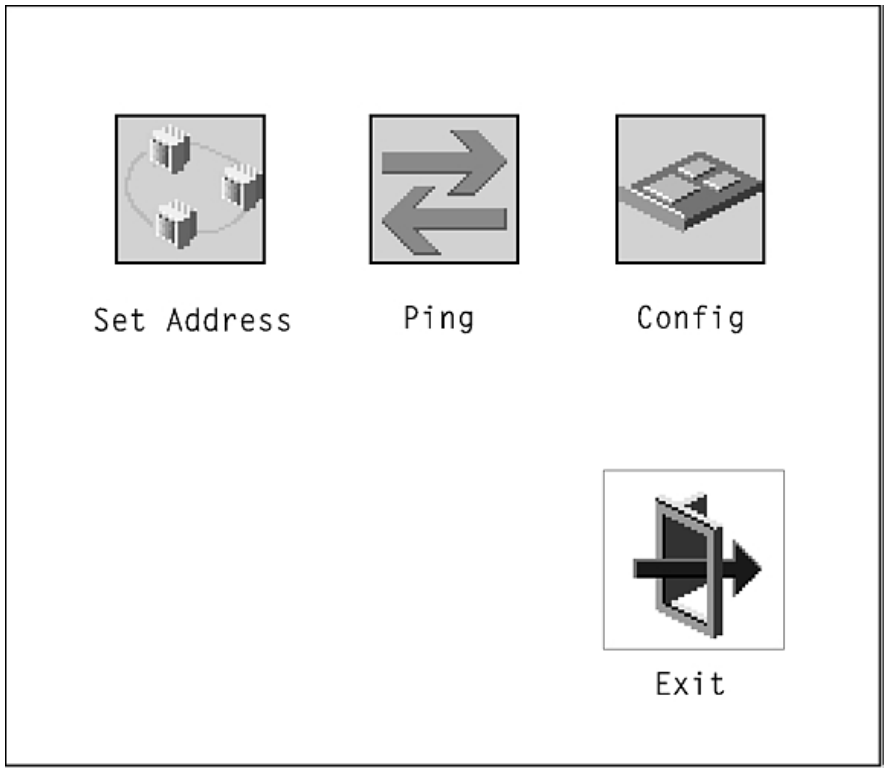
This error log only shows the first and last errors.

Note: The time stamp in this error log is coordinated universal time (UTC), which is also referred to as Greenwich mean time (GMT). AIX error logs have more information available and can time stamp with your local time.

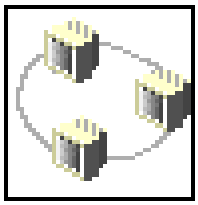
RIPL



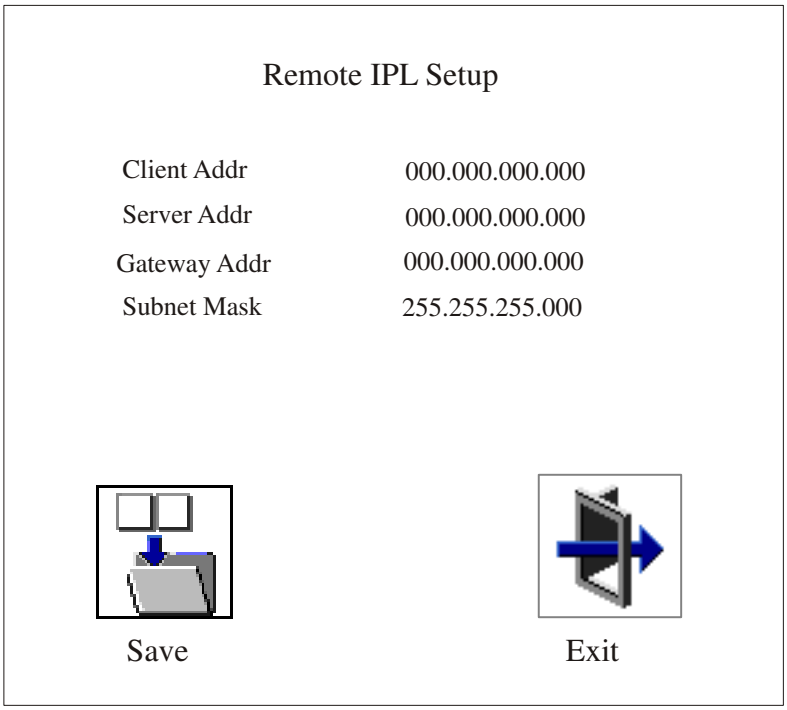
Selecting the **Remote Initial Program Load (RIPL**) icon above gives you access to the following selections.



Set Address



The Set Address icon allows you to define addresses from which your system unit can receive RIPL code.



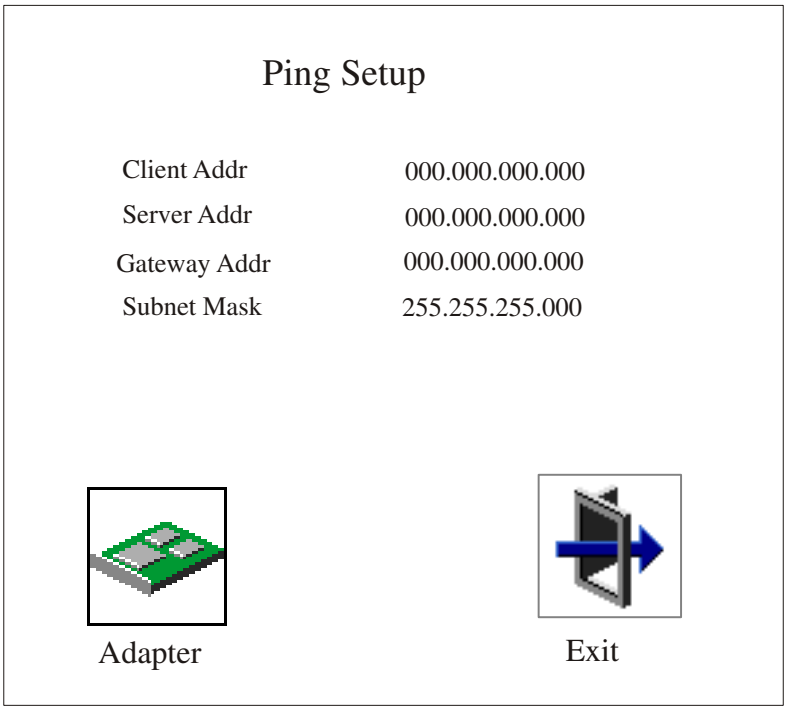
If any of the addresses is incomplete or contains a number other than 0 to 255, an error message displays when you select the **Save** icon. To clear this error, correct the address and select **Save** again.

Attention: If the client system and the server are on the same subnet, set the gateway IP address to [0.0.0.0].

To change an address, press the backspace key on the highlighted address until the old address is completely deleted. Then type the new address.

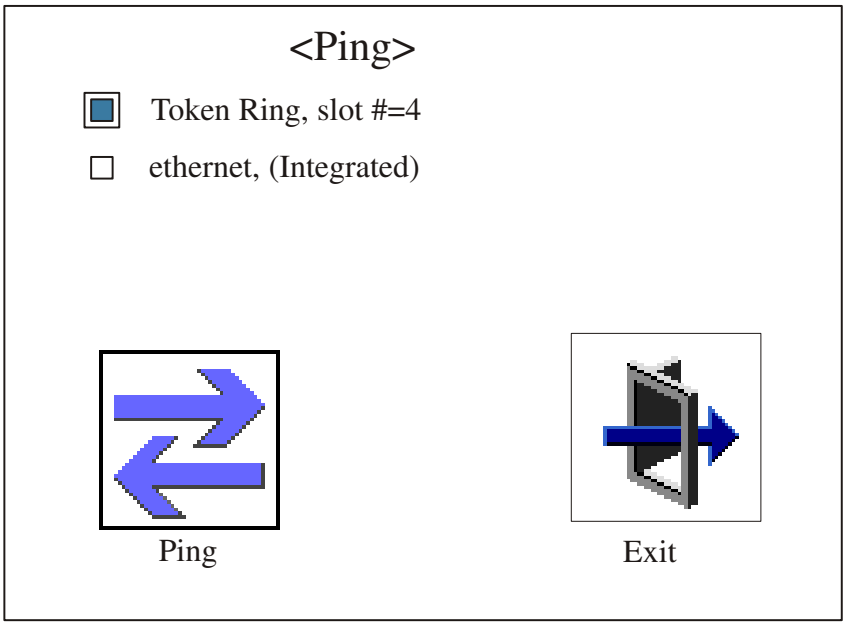
Ping

The **Ping** icon allows you to confirm that a specified address is valid by sending a test transmission to that address.



To change an address, press the backspace key on the highlighted address until the old address is completely deleted. Then type the new address.

Selecting the **Ping** icon displays a screen in which you select the communications (token–ring or Ethernet) to be used to send test transmissions.



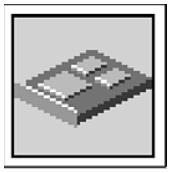
To use this screen, do the following:

1. Use the arrow keys or mouse to highlight an adapter to configure.

   Note: Clicking with the mouse sends the ping. If you use the arrow keys you must press the space bar, then use the **Ping** icon.

2. Press the spacebar to select the adapter.
3. Highlight the **Ping** icon and press Enter to send the test transmission.

Config

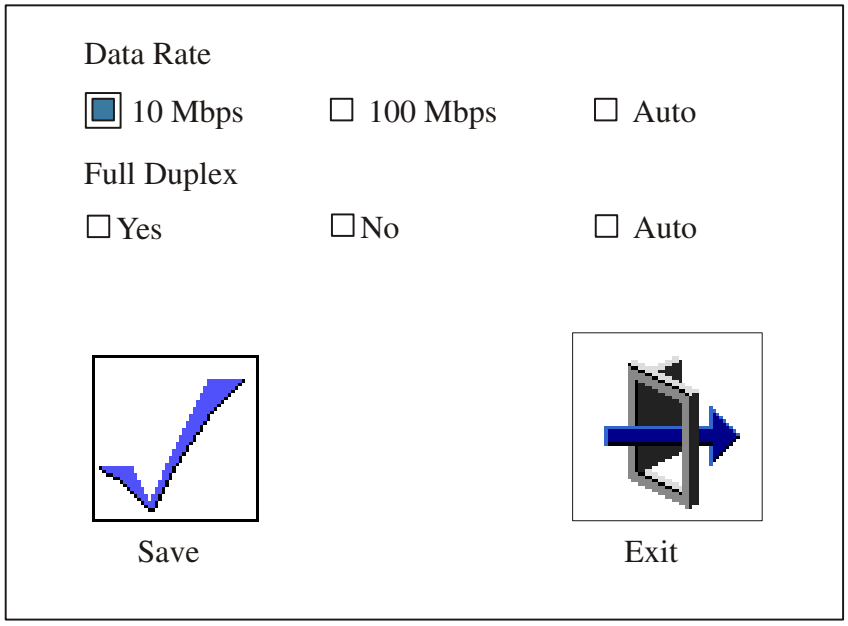


The **Config** icon allows you to configure network adapters which require setup.

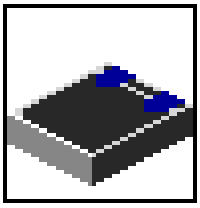
Selecting the **Config** icon causes a list of the adapters requiring configuration to display.

To use this screen, do the following:

1. Use the arrow keys or mouse to highlight an adapter to configure.
2. Press the spacebar to select the adapter.
3. Highlight the **OK** icon and press Enter.

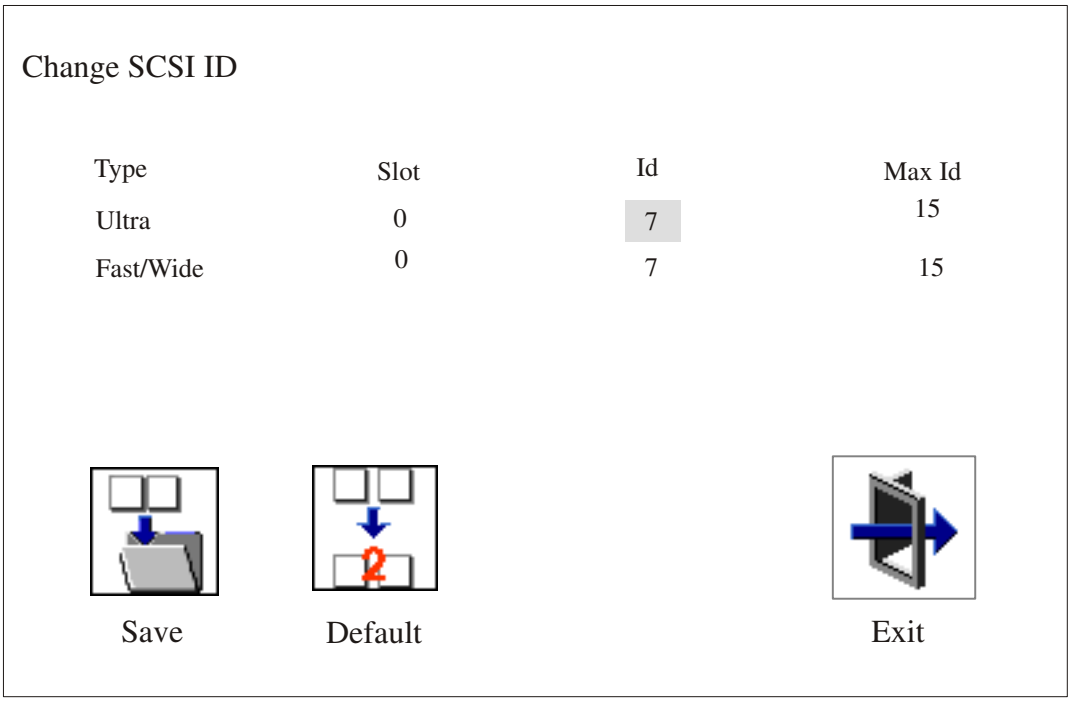


SCSI ID



To change a SCSI controller ID, highlight the entry by moving the up or down arrow keys, then use the spacebar to scroll through available IDs. After you have entered the new address, use the left or right arrow keys or mouse to highlight the **Save** icon and press Enter.

At any time in this process, you can select the **Default** icon to change the SCSI IDs to the default values.



Firmware Update

Attention: The SMS firmware update utility does not support the combined image update process. It is recommended only for those systems that boot AIX. To obtain firmware update images or instructions, contact your service representative.

If the firmware update image is available on your network from another system, see "Appendix A, Firmware Updates" for instructions on updating the system and service processor firmware using a combined image from the AIX command line.

Firmware Recovery

If a troubleshooting procedure has indicated that the system firmware unit has been damaged, it may be possible to recover it. For example, if the system hangs during startup with E1EA displayed on the operator panel, the system firmware has been damaged but may be recovered.

To recover damaged system firmware, do the following:

1. Create a firmware recovery diskette. This must be a 3.5" high–density (1.44 MB) diskette that has been formatted for DOS.
2. Contact your service representative to obtain the system firmware update image file
3. Copy the system firmware update image file to the recovery diskette, naming it PRECOVER.IMG. The file must be written in DOS format.
4. When the system stops booting, for example at `E1EA`, insert the recovery diskette. If the diskette drive LED does not light up, power the system unit off, then back on again.
5. If the recovery procedure is successful, the system will continue starting and will display checkpoints of the form `E1XX`.
6. Enter the System Management Services menu. When the keyboard indicator displays, press the 1 key if the system console is an ASCII terminal. If the system console is a graphics display and directly attached keyboard, press the F1 key.
7. When the main menu displays, choose Utilities, then perform an update of the system firmware by following the prompts that are displayed.

Attention: A companion service processor firmware update may be required. Contact your service representative to get additional information on companion levels, and detailed update instuctions.

Text–Based System Management Services

The text–based System Management Services are available if an ASCII terminal is attached to your system. The text–based System Management Services make it possible for you to view information about your system and to perform such tasks as setting passwords and changing device configurations.

To start the text–based System Management Services, press the number **1** key on the ASCII terminal after the word ”keyboard” appears and before the word ”speaker” appears. After the text–based System Management Services starts, the following screen displays.

Note: The version of firmware currently installed in your system is displayed at the top of each screen in the text–based System Management Services. Note the version number. Processor and other device upgrades may require a specific version of firmware to be installed in your system. Update System Firmware is an option under the Main Menu.

On all menus except the Main Menu, there are several navigator keys:

M Return to the main menu.

ESC Return to the previous menu.

X Exit the System Management Services and start the operating system. If X is entered, you are asked to confirm your choice to exit the SMS menus and start the operating system.

When there is more than one page of information to display, there are two additional navigator keys:

N Display the next page of the list.

P Display the next page of the list.

Note: The lower–case navigator key has the same effect as the upper–case key that is shown on the screen. For example, ”m” or ”M” takes you back to the main menu.

On each menu screen, you are given the option of choosing a menu item and pressing enter (if applicable), or selecting a navigator key.

```
+------------------------------------------------------------------------------+
|Main Menu                                                                     |
|                                                                              |
| 1   Select Language                                                          |
| 2   Change Password Options                                                  |
| 3   View Error Log                                                           |
| 4   Setup Remote IPL (Initial Program Load)                                  |
| 5   Change SCSI Settings                                                     |
| 6   Select Console                                                           |
| 7   Select Boot Options                                                      |
| 8   View System Configuration Components                                     |
| 9   System/Service Processor Firmware Update                                 |
|                                                                              |
|                                                                              |
|------------------------------------------------------------------------------|
|Navigator keys:                                                               |
|                                                                              |
|                                                          X = eXit System M|
|------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _ |
|                                                                              |
+------------------------------------------------------------------------------+
```

Select Language

Note: Your TTY must support the ISO–8859 character set to properly display languages other than English.

This option allows you to change the language used by the text–based System Management Services screens.

```
+------------------------------------------------------------------------------+
| SELECT LANGUAGE                                                              |
|                                                                              |
|  1.  English                                                                 |
|  2.  Francais                                                                |
|  3.  Deutsch                                                                 |
|  4.  Italiano                                                                |
|  5.  Espanol                                                                 |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|------------------------------------------------------------------------------|
|Navigator keys:                                                               |
|M = return to main menu                                                       |
|ESC key = return to previous screen                          X = eXit System M|
|------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _ |
+------------------------------------------------------------------------------+
```

Change Password Options

The Change Password Options screen enables you to select from password utilities.

```
+------------------------------------------------------------------------------+
|                                                                              |
|                                                                              |
|Password Utilities                                                            |
|                                                                              |
| 1 Set Privileged-Access Password                                             |
| 2 Remove Privileged-Access Password                                          |
| 3 Unattended Start Mode <OFF>                                                |
|                                                                              |
|                                                                              |
|                                                                              |
|------------------------------------------------------------------------------|
|Navigator keys:                                                               |
|M = return to main menu                                                       |
|ESC key = return to previous screen                          X = eXit System M|
|------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _ |
+------------------------------------------------------------------------------+
```

Set Privileged–Access Password

The privileged–access password protects against the unauthorized starting of the system programs.

Attention: If the privileged–access password has been enabled, you are asked for the privileged–access password at startup every time you boot your system.

If you previously had set a privileged–access password and want to remove it, select **Remove Privileged–Access Password** .

Unattended Start Mode

Use this option to instruct the service processor to immediately power–on the server after a power failure, bypassing power–on password verification. Unattended start mode can also be enabled or disabled using service processor menus. Unattended start mode can be used on servers that require automatic power–on after a power failure.

Note: Unlike other systems, unattended start mode is not automatically disabled when the power–on access password is removed.

View Error Log

Use this option to view or clear your system's error log. A screen similar to the following displays when you select this option.

```
+------------------------------------------------------------------------------+
| Error Log                                                                    |
|                                                                              |
|          Date       Time       Error Code      Location                      |
| Entry 1. 01/04/96   12:13:22   25A80011        00-00                         |
| Entry 2. no error logged                                                     |
|                                                                              |
|1. Clear error log                                                            |
|                                                                              |
|                                                                              |
|                                                                              |
|------------------------------------------------------------------------------|
|Navigator keys:                                                               |
|M = return to main menu                                                       |
|ESC key = return to previous screen                          X = eXit System M|
|------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _ |
+------------------------------------------------------------------------------+
```

Note: The time stamp in his error log is coordinated universal time (UTC), which is also referred to as Greenwich mean time (GMT). AIX error logs have more information available and can time stamp with your local time.

Setup Remote IPL (Initial Program Load)

This option allows you to enable and set up the remote startup capability of your system unit. You must first specify the network parameters.

```
+------------------------------------------------------------------------------+
|                                                                              |
|Network Parameters                                                            |
|                                                                              |
| 1. IP Parameters                                                             |
| 2. Adapter Parameters                                                        |
| 3. Ping                                                                      |
|                                                                              |
|                                                                              |
|                                                                              |
|------------------------------------------------------------------------------|
|Navigator keys:                                                               |
|M = return to main menu                                                       |
|ESC key = return to previous screen                          X = eXit System M|
|------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _ |
+------------------------------------------------------------------------------+
```

Selecting the IP (Internet Protocol) Parameters option displays the following screen.

```
+------------------------------------------------------------------------------+
|IP Parameters                                                                 |
|                                                                              |
| 1. Client IP Address    [000.000.000.000]                                    |
| 2. Server IP Address    [000.000.000.000]                                    |
| 3. Gateway IP Address   [000.000.000.000]                                    |
| 4. Subnet Mask          [255.255.255.000]                                    |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|------------------------------------------------------------------------------|
|Navigator keys:                                                               |
|M = return to main menu                                                       |
|ESC key = return to previous screen                          X = eXit System M|
|------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _ |
+------------------------------------------------------------------------------+
```

To change IP parameters, type the number of the parameters for which you want to change the value.

Attention: If the client system and the server are on the same subnet, set the gateway IP address to [0.0.0.0].

Selecting the **Adapter Parameters** option allows you to view an adapter's hardware address, as well as configure network adapters that require setup. A screen similar to the following displays.

```
+------------------------------------------------------------------------------+
|                                                                              |
|                                                                              |
|                                                                              |
| Device                    Slot              Hardware Address                 |
|                                                                              |
| 1. ethernet                 3                 0004AC5E08D2                   |
| 2. token-ring               5                 0020357A0530                   |
| 3. ethernet             Integrated            0004ACE4020B                   |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|------------------------------------------------------------------------------|
|Navigator keys:                                                               |
|M = return to main menu                                                       |
|ESC key = return to previous screen                          X = eXit System M|
|------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _ |
+------------------------------------------------------------------------------+
```

Selecting an adapter on this screen displays configuration menus for that adapter:

```
+------------------------------------------------------------------------------+
|                                                                              |
|10/100 Ethernet TP PCI Adapter                                                |
|                                                                              |
|                                                                              |
|1. Data Rate           (Currently Auto)                                       |
|2. Full Duplex         (Currently Yes)                                        |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|------------------------------------------------------------------------------|
|Navigator keys:                                                               |
|M = return to main menu                                                       |
|ESC key = return to previous screen                          X = eXit System M|
|------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _ |
+------------------------------------------------------------------------------+
```

Selecting the **Data Rate** option allows you the change the media employed by the Ethernet adapter:

```
+------------------------------------------------------------------------------+
|                                                                              |
|Select Data Rate                                                              |
|                                                                              |
|  1. 10 Mbps                                                                  |
|  2. 100 Mbps                                                                 |
|  3. Auto                                                                     |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|------------------------------------------------------------------------------|
|Navigator keys:                                                               |
|M = return to main menu                                                       |
|ESC key = return to previous screen                          X = eXit System M|
|------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _ |
+------------------------------------------------------------------------------+
```

Selecting the **Full Duplex** option allows you to change how the Ethernet adapter communicates with the network:

```
+------------------------------------------------------------------------------+
|Select Full Duplex Mode                                                       |
|                                                                              |
|  1. Yes                                                                      |
|  2. No                                                                       |
|  3. Auto                                                                     |
|                                                                              |
|                                                                              |
|                                                                              |
|------------------------------------------------------------------------------|
|Navigator keys:                                                               |
|M = return to main menu                                                       |
|ESC key = return to previous screen                          X = eXit System M|
|------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _ |
+------------------------------------------------------------------------------+
```

Select **Ping** , from the Network Parameters Menu, to test a connection to a remote system unit. After selecting the **Ping** option, you must choose which adapter communicates with the remote system.

```
+------------------------------------------------------------------------------+
| Adapter Parameters                                                           |
|                                                                              |
|Device                    Slot              Hardware Address                |
|                                                                              |
| 1. 100/10 Ethernet       5:P1-I5/E1         0060940d5151                    |
| 2. fddi                  4:P1-I4/Q1         00005a4263cd                    |
| 3. 100/10 Ethernet       Integrated: P1/E1  000000000000                    |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|------------------------------------------------------------------------------|
|Navigator keys:                                                               |
|M = return to main menu                                                       |
|ESC key = return to previous screen                          X = eXit System M|
|------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _ |
+------------------------------------------------------------------------------+
```

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

```
+-------------------------------------------------------------------------------+
|Ping IP Address                                                                |
|                                                                               |
| 1. Client IP Address    [129.132.4.20]                                        |
| 2. Server IP Address    [129.132.4.10]                                        |
| 3. Gateway IP Address   [129.132.4.30]                                        |
| 4. Subnet Mask          [255.255.255.0]                                       |
| 5. Execute Ping                                                               |
|                                                                               |
|                                                                               |
|                                                                               |
|                                                                               |
|                                                                               |
|                                                                               |
|-------------------------------------------------------------------------------|
|Navigator keys:                                                                |
|M = return to main menu                                                        |
|ESC key = return to previous screen                          X = eXit System M|
|-------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _  |
+-------------------------------------------------------------------------------+
```

Change SCSI Settings

This option allow you to view and change the addresses of the SCSI controllers attached to your system.

```
+-------------------------------------------------------------------------------+
|SCSI Utilities                                                                 |
|                                                                               |
|  1. Change Hardware Spin Up Delay                                             |
|  2. Change SCSI Id                                                            |
|                                                                               |
|                                                                               |
|                                                                               |
|                                                                               |
|-------------------------------------------------------------------------------|
|Navigator keys:                                                                |
|M = return to main menu                                                        |
|ESC key = return to previous screen                          X = eXit System M|
|-------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _  |
+-------------------------------------------------------------------------------+
```

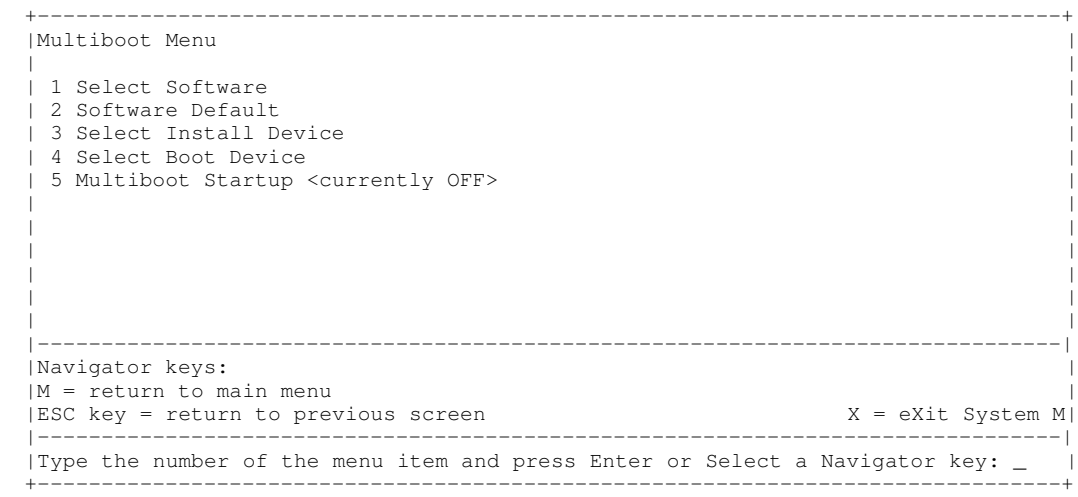
Select Console

The Select Console Utility allows the user to select which console the user would like to use to display the SMS menus. This selection is only for the SMS menus and does not affect the display used by the AIX operating system.

Follow the instructions that display on the screen. To return to the SMS menu, press the number **1** key after the word **keyboard** displays and before the tone sounds.

Select Boot Options

Use this screen to view and set various options regarding the operating system and boot sequence.



Select Software : If this option is supported by the operating system, it shows the name of the operating system installed. This option may not be supported by all operating systems.

If you are running on AIX and you receive the following message:

```
No Operating System Installed
```

this indicates that information in nonvolatile storage could have been lost, as would happen if the battery had been removed. To re–create this value, run the **bootlist** command under AIX with the appropriate parameters as to the location of the operating system in a particular hard disk. See the **bootlist** command in your AIX documentation. The AIX Documentation library is available at the following Web address: http://www.ibm.com/servers/aix/library/. Select **Technical Publications** . AIX documentation is also contained on the AIX Documentation CD. The documentation is made accessible by loading the BKSYM.DOCCD1 onto the hard disk or by mounting the CD in the CD–ROM drive.

Software Default : If supported by the operating system, lets you select the default operating system to start the system. This option may not be supported by all operating systems.

Select Install Device : Produces a list of devices, for example the CD–ROM, from which the operating system is installed. Select a device and the system searches the device for an operating system to install and if supported by the operating system in that device, the name of the operating system displays.

Select Boot Device : Provides a list of devices that can be selected to be stored in the boot list. Up to five devices are supported.

OK Prompt : Provides access to the open firmware command prompt. This option should only be used by service personnel to obtain additional debug information.

Multiboot Startup : Toggles between OFF and ON and selects whether the Multiboot menu invokes automatically on startup.

Select Boot Device

Select this option to view and change the custom boot list, which is the sequence of devices read at startup.

```
+-------------------------------------------------------------------------------+
|Select Boot Devices                                                            |
|                                                                               |
| 1 Display Current Settings                                                    |
| 2 Restore Default Settings                                                    |
| 3 Configure 1st Boot Device                                                   |
| 4 Configure 2nd Boot Device                                                   |
| 5 Configure 3rd Boot Device                                                   |
| 6 Configure 4th Boot Device                                                   |
| 7 Configure 5th Boot Device                                                   |
|                                                                               |
|                                                                               |
|-------------------------------------------------------------------------------|
|Navigator keys:                                                                |
|M = return to main menu                                                        |
|ESC key = return to previous screen                          X = eXit System M|
|-------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _  |
+-------------------------------------------------------------------------------+
```

Display Current Settings : Lists the current order of devices in the boot list. The following screen shows an example of this display.

```
+-------------------------------------------------------------------------------+
|Current Boot Device                                                            |
|                                                                               |
| 1. SCSI 9100 MB Harddisk (loc = P1-I6/Z1-A8                                   |
| 2. SCSI CD-ROM (loc = P1/Z1-A1)                                               |
| 3. SCSI Tape (loc = P1/Z1-A0)                                                 |
| 4. Ethernet (loc = P1-I5/E10)                                                 |
| 5. None                                                                       |
|                                                                               |
|                                                                               |
|                                                                               |
|                                                                               |
|                                                                               |
|-------------------------------------------------------------------------------|
|Navigator keys:                                                                |
|M = return to main menu                                                        |
|ESC key = return to previous screen                          X = eXit System M|
|-------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _  |
+-------------------------------------------------------------------------------+
```

Restore Default Settings : Restores the boot list to the default device of:

1. Primary diskette drive
2. CD–ROM drive
3. Tape drive (if installed)
4. Hard disk drive
5. Network adapter

Attention: To change the custom boot list back to the default values, select the **Default** . If you change your startup sequence, you must be extremely careful when performing *write* operations (for example, copying, saving, or formatting). You can accidentally overwrite data or programs if you select the wrong drive.

Configure Nth Boot Device

In the description below, **Nth** can be **1st, 2nd, 3rd,** and so on, depending on your choice on the previous menu.

Options display a screen similar to the following:

```
+------------------------------------------------------------------------------+
|                                                                              |
|     Configure Nth Boot Device                                                |
|                                                                              |
|        Device              Current             Device                        |
|        Number              Position             Name                         |
|                                                                              |
|           1                    1               Diskette                      |
|           2                    2               Port E2 - 100/10 Ethernet Adapt|
|           3                                    Port E1 - 100/10 Ethernet Adapt|
|           4                    3               IDE CD-ROM                    |
|           5                    4               SCSI 36.4 MB Hard Disk id=@0,0 |
|           6                    -                                             |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|------------------------------------------------------------------------------|
|Navigator keys:                                                               |
|M = return to main menu                                                       |
|ESC key = return to previous screen                        X = eXit System M|
|------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _ |
+------------------------------------------------------------------------------+
```

Type the device number of the device name that you want to select as the **Nth** boot device. For example, if you entered this menu by selecting 4 on the previous menu (configure 2nd Boot Device), then enter the number 3 based on the list shown above. You are thus selecting the SCSI CD–ROM device to be the 2nd **(Nth)** device in the boot sequence.

View System Configuration Components

This option provides information about the setup of your system unit. A screen similar to the following displays.

```
+-------------------------------------------------------------------------------+
|  Device Name                                                                  |
|                                                                               |
|  Power PC, POWER3  375 MHz                                                    |
|  L2-Cache 4096K                                                               |
|  Power PC, POWER3  375 MHz                                                    |
|  L2-Cache 4096K                                                               |
|  Memory                                                                       |
|     Memory card slot=1, module slot=1 size=512MB                              |
|     Memory card slot=1, module slot=2 size=512MB                              |
|     Memory card slot=1, module slot=3 size=512MB                              |
|     Memory card slot=1, module slot=4 size=512MB                              |
|                                                                               |
|Service Processor                                                              |
|Tablet Port                                                                    |
|                                                                               |
|  LPT     addr=378                                                             |
|                                                                               |
|  COM     addr=3F8                                                             |
|                                                                               |
|  COM     addr=2F8                                                             |
|                                                                               |
|  Keyboard                                                                     |
|  Mouse                                                                        |
|  Diskette addr=3F0                                                            |
|                                                                               |
|  SCSI controller id=7 (P1/Z1)                                                 |
|                                                                               |
|                                                                               |
|                                                                               |
|-------------------------------------------------------------------------------|
|Navigator keys:                                                                |
|M = return to main menu            N = next page of list              P = previ|
|ESC key = return to previous screen                            X = eXit System M|
|-------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _  |
+-------------------------------------------------------------------------------+
```

System/Service Processor Firmware Update

```
+-------------------------------------------------------------------------------+
|                                                                               |
| Firmware Update Menu                                                          |
|                                                                               |
| 1. System Firmware                                                            |
| 2. Service Processor Firmware                                                 |
|                                                                               |
|                                                                               |
|                                                                               |
|                                                                               |
|-------------------------------------------------------------------------------|
|Navigator keys:                                                                |
|M = return to main menu                                                        |
|ESC key = return to previous screen                            X = eXit System M|
|-------------------------------------------------------------------------------|
|Type the number of the menu item and press Enter or Select a Navigator key: _  |
+-------------------------------------------------------------------------------+
```

Attention: The SMS firmware update utility does not support the combined image update process. It is recommended only for those systems that cannot boot AIX. To obtain firmware update images or instructions, contact your service representative.

If the firmware update image is available on your network from another system, see “Appendix A, Firmware Updates” for instructions on updating the system and service processor firmware using a combined image from the AIX command line.

Firmware Recovery

For instructions on firmware recovery, go to Firmware Recovery on page 4-19 .

Chapter 5. Using the Online and Standalone Diagnostics

The diagnostics consist of Standalone Diagnostics and Online Diagnostics. The Standalone Diagnostics must be booted before they are run. If booted, they have no access to the AIX Error Log or the AIX Configuration Data.

Online Diagnostics, when installed, are resident with AIX on the disk or server. They can be booted in single user mode (called service mode), run in maintenance mode (called maintenance mode), or run concurrently (called concurrent mode) with other applications. They have access to the AIX Error Log and the AIX Configuration Data.

Attention: If this system unit is attached to another system, be sure you isolate this system unit before stopping the operating system or running diagnostic programs. Some system–cabling changes (such as installing wrap plugs or removing a device from the configuration) may require action by the operator of the attached system before making the cabling changes on this system.

Online and Standalone Diagnostics Operating Considerations

Consider the following before using the diagnostics:

- Run Online Diagnostics in Service Mode when possible, unless otherwise directed. The Online Diagnostics perform additional functions, compared to Standalone Diagnostics. The AIX error log and certain SMIT functions are only available when diagnostics are run from the disk drive.
- When running Online Diagnostics, device support for some devices may not have been installed. If this is the case, that device does not appear in the resource list.
- When running Standalone Diagnostics, device support for some devices may be contained on supplemental diagnostic media. If this is the case, the device does not appear in the resource list when running diagnostics unless the supplemental media has been processed.
- Support for some TTY terminals is optionally installed. If you attach a TTY terminal to a system to run diagnostics, it might not work correctly because the AIX support for the terminal might not be installed.

Selecting a Console Display

When you run Standalone Diagnostics and under some conditions Online Diagnostics, you need to select the console display. The diagnostics display instructions on any graphics display and the terminal attached to the S1 serial port.

Identifying the Terminal Type to Diagnostics

Note: This is not the same as selecting a console display.

When you run diagnostics, the diagnostics must know what type of terminal you are using. If the terminal type is not known when the FUNCTION SELECTION menu is displayed, the diagnostics do not allow you to continue until a terminal is selected from the DEFINE TERMINAL option menu. Select **lft** for graphical displays.

Undefined Terminal Types

If an undefined terminal type from the DEFINE TERMINAL option menu is entered, the menu prompts the user to enter a valid terminal type, and the menu is redisplayed until either a valid type is entered or the user exits the DEFINE TERMINAL option.

Resetting the Terminal

If the user enters a terminal type that is valid (according to the DEFINE TERMINAL option menu) but is not the correct type for the ASCII terminal being used, difficulty may be encountered in reading the screen, using the function keys or the Enter key. These difficulties can be bypassed by pressing Ctrl–C to reset the terminal. The screen display which results from this resetting action varies with the mode in which the system is being run:

- Online Normal or Maintenance Mode – The command prompt appears.
- Standalone Mode or Online Service Mode –The terminal type is reset to ”dumb”, the Diagnostic Operating Instruction panel is displayed, and the user is required to go through the DEFINE TERMINAL process again.

Running Online Diagnostics from CD–ROM

Consider the following when you run the Online Diagnostics from a server or a disk:

- The diagnostic CD–ROM disc must remain in the CD–ROM drive for the entire time that diagnostics are running.
- The diagnostic CD–ROM disc cannot be ejected from the CD–ROM drive once the diagnostic programs load. The diagnostic CD–ROM disc can only be ejected after the system has been powered off and then powered on (Standalone mode), or after the diagnostics program has terminated (Online concurrent mode). The diagnostic CD–ROM disc must be ejected before attempts to load the diagnostic programs again.
- The CD–ROM drive from which diagnostics were loaded cannot be tested.
- The SCSI adapter (or circuitry) controlling the CD–ROM drive from which diagnostics were loaded cannot be tested.

Running Standalone Diagnostics from a Network Management (NIM)

A client system connected to a network with a Network Installation Management (NIM) server, is capable of booting Standalone Diagnostics from the NIM server if the client system is registered on the NIM server, and the NIM boot settings on both the NIM server and the client system are correct.

Notes:

1. For NIM clients that have adapters which would normally require that supplemental media be loaded when standalone diagnostics are run from CD–ROM, the support code for these adapters needs to be loaded into the directory pointed to by the NIM SPOT from which you wish to boot that client. Before running standalone diagnostics on these clients from the NIM server, the NIM server system administrator must ensure that any needed support for these devices is loaded on the server.
2. The amount of system memory required to run Standalone Diagnostics from a NIM server using the bos.diag.rte fileset at level 4.3.3.25, is 64 MB.

   To determine the fileset level, run the following AIX command at the NIM server (you must have root authority):

```
nim –o showres SPOTNAME | grep bos.diag.rte
```

   (Where SPOTNAME is the name of the SPOT from which you want to do a NIM boot (example, SPOT433).

   Use one of the following methods to determine the amount of available system memory:

   – Run the Display Resource Attributes task for resource.

   – Use the Config option under System Management Services (see the system unit service guide).

– Use the following AIX command:

```
lsattr -E -l mem0
```

3. All operations to configure the NIM server require root authority.
4. If you replace the network adapter in the client, the network adapter hardware address for the client must be updated on the NIM server.
5. The Control state (Cstate) for standalone clients on the NIM server should be kept in the Diagnostic Boot has been Enabled state.
6. On the client system, the NIM server network adapter should be put in the bootlist after the boot disk drive. This allows the system to boot up in Standalone Diagnostics from the NIM server should there be a problem booting from the disk drive. Refer to the ”Multiboot” section under SMS chapter in the service guide for the client system to obtain information about setting the bootlist.

NIM Server Configuration

Refer to the *Network Installation Management Guide and Reference* for information on doing the following:

- Register a client on the NIM server.
- Enable a client to run diagnostics from the NIM server.

To verify that the client system is registered on the NIM server and diagnostic boot is enabled; from the command line on the NIM server, run the following command:

```
lsnim -a Cstate -Z ClientName
```

Refer to the following table for system responses.

Note: The ClientName is the name of the system on which you are wanting to run the Standalone Diagnostics.

System Response	Client Status
`#name:Cstate:` `ClientName: diagnostic boot has been enabled:`	The client system is registered on the NIM server and enabled to run diagnostics from the NIM server.

`#name:Cstate:`
`ClientName:ready for a NIM operation:`
`or`
`#name:Cstate:`
`ClientName:BOS installation has been enabled:`
	The client system is registered on the NIM server but not enabled to run standalone diagnostics from the NIM server.
	Note: client system is registered on the NIM server but Cstate has not been enabled, no data will be returned.

`0042-053 lsnim: there is no NIM object named ”ClientName”`	The client is not registered on the NIM server.

Client Configuration and Booting Standalone Diagnostics from the NIM Server

To run Standalone Diagnostics on a client system from the NIM server, do the following:

1. Remove all removable media (tape or CD–ROM disc).
2. Stop all programs, including the AIX operating system (get help if needed).
3. Turn off the system unit power.
4. Turn on the system unit power.
5. When the keyboard indicator displays (the word **keyboard** on an ASCII terminal or the Keyboard icon on a graphical display), press the number 1 key on the keyboard to display the SMS menu.

6. Enter any requested passwords.
7. Select **Utilities**.
8. Depending on the console type, select **RIPL** or **Remote Initial Program Load Setup**.
9. Depending on the console type, select **Set Address** or **IP Parameters**.
10. Enter the client address, server address, gateway address (if applicable), and subnet mask into the Remote Initial Program Load (RIPL). If there is no gateway between the NIM server and the client, set the gateway address to 0.0.0.0. To determine if there is a gateway, either ask the system network administrator or compare the first 3 octets of the NIM server address and the client address. If they are the same, (for example, if the NIM server address is 9.3.126.16 and the client address is 9.3.126.42, the first 3 octets (9.3.126) are the same), then set the gateway address in the RIPL field to 0.0.0.0.

    Note: RIPL is located under the Utility menu in System Management Services (SMS) and should be referred to for information on setting these parameters.

11. If the NIM server is setup to allow the pinging of the client system, use the ping option in the RIPL utility to verify that the client system can ping the NIM server. Under the Ping utility, choose the network adapter that provides the attachment to the NIM server to do the ping operation. If the ping comes back with an OK prompt, the client is prepared to boot from the NIM server. If ping returns with a *FAILED* prompt, the client does not proceed with the boot.

    Note: If the ping fails, refer to ”Boot Problems/Concerns” in the service guide for the system unit. Then follow the steps for network boot problems.

Use the following procedure to temporarily changes the system bootlist so that the network adapter attached to the NIM server network, is first in the bootlist:

1. Exit to the SMS Main screen.
2. Depending on the console type, select **Multiboot** or **Select Boot Devices**.
3. Depending on the console type, select **Boot Sequence** or **Select Boot Devices**.
4. Record the current bootlist settings. (You will have to set the bootlist back to the original settings after running diagnostics from the NIM server.)
5. Change the bootlist so the network adapter attached to the NIM server is first in the bootlist.
6. Exit completely from SMS. The system should start loading packets while doing a bootp from the network.

Follow the instructions on the screen to select the system console.

If Diagnostics Operating Instructions Version x.x.x is displays, Standalone Diagnostics has loaded successfully. If the AIX login prompt displays, Standalone Diagnostics did not load. Check the following items:

- The bootlist on the client might be incorrect.
- Cstate on the NIM server might be incorrect.
- There might be network problems preventing you from connecting to the NIM server.

Verify the settings and the status of the network. If you continue to have problems, refer to ”Boot Problems/Concerns” in the service guide for the system unit. Then follow the steps for network boot problems.

After running diagnostics, reboot the system and use SMS to change the bootlist sequence back to the original settings.

Locking and Unlocking the Electronic Service Agent

If the system is setup with a Electronic Service Agent, you must lock out the Electronic Service Agent before running diagnostics. This prevents the Electronic Service Agent from using the diagnostics while you are running them. Use the following commands to lock out the Electronic Service Agent:

```
cd /usr/lpp/servdir
ls /usr/lpp/servdir/servdir.lck
```

If a file named **servdir.lck** is listed, the Electronic Service Agent is already locked out. If it is not listed, use the following command to create the file:

```
 /usr/lpp/servdir/servdir.lck
```

Use the following command to check that the servdir.lck file was created (if the file is present the Electronic Service Agent is locked out):

```
/usr/lpp/servdir/servdir.lck
```

Use the following commands to unlock the Electronic Service Agent:

```
/usr/lpp/servdir/servdir.analyze reset
rm /usr/lpp/servdir/servdir.lck
```

Use the following command to check that the servdir.lck file was deleted (the file should not be present):

```
ls /usr/lpp/servdir/servdir.lck
```

If the file is listed, the Electronic Service Agent is still locked out.

Locking and Unlocking the Service Agent

If the system is setup with a service agent, you must lock out the service agent before running diagnostics.

Note: The system does not report problems while the service agent is locked out. When you complete your service action, be sure to unlock the service agent to allow it to report problems.

Use the following procedure to lock out the service agent:

1. Click the **Administration** folder.
2. Select the **Lockout Machines** option.
3. In the Detail screen, select the system you want to lock out, then click **Lock**.
4. To verify that the system is locked out, click the **Network** folder.
5. Click the Padlock icon to display the lockout status. The system you locked out should have a red X displayed, indicating it is locked out.

Use the following procedure to unlock the service agent:

1. Click the **Administration** folder.
2. Select the **Lockout Machines** option.
3. In the Detail screen, select the system you want to unlock, and click **Unlock**.
4. To verify that the system is unlocked, click the **Network** folder.
5. Click the Padlock icon to display the lockout status. The system you unlocked should not have a red X displayed.

Running Online Diagnostics

Consider the following when you run the Online Diagnostics from a server or a disk:

- The diagnostics cannot be loaded and run from a disk until the AIX operating system has been installed and configured. After the installation of the AIX operating system, all three modes of operation are available.
- The diagnostics cannot be loaded on a system (client) from a server if that system is not set up to IPL from a server over a network, or the server has not been setup to send a service mode IPL of the diagnostics. When the system is set up to IPL from a server, the diagnostics are executed in the same manner as they are from disk.
- If the diagnostics were loaded from disk or a server, you must shut down the AIX operating system before powering off the system unit to prevent possible damage to disk data. This is done in one of two ways:
  - If the diagnostic programs were loaded in Standalone mode, press the F3 key until DIAGNOSTIC OPERATING INSTRUCTIONS displays; then follow the displayed instructions to shut down the AIX operating system.
  - If the diagnostic programs were loaded in maintenance or concurrent mode, enter the **shutdown –F** command.
- Under some conditions the system may stop, with instructions displayed on attached displays and terminals. Follow the instructions to select a console display.

Running the Diagnostics from a TTY Terminal

Consider the following when you run diagnostics using a TTY–type terminal as the console display:

- See the operator manual for your type of tty terminal to find the key sequences you need to respond to the diagnostics.

Refer to *Terminals and Printers Configuration Guide*, order number 86 A1 22WE, for more information about terminals settings.

Online Diagnostics Modes of Operation

The Online Diagnostics can be run in three modes:

- *Service Mode* allows checking of most system resources.
- *Concurrent Mode* allows the normal system functions to continue while selected resources are being checked.
- *Maintenance Mode* allows checking of most system resources.

Running the Online Diagnostics in Service Mode (Service Mode IPL)

Service mode provides the most complete checkout of the system resources. This mode also requires that no other programs be running on the system. All supported system resources except the SCSI adapter, and the disk drives used for paging can be tested. However, the system memory and the processor are only tested during power–on self–test (POST).

Error log analysis is done in service mode when you select the **Problem Determination** option on the DIAGNOSTIC MODE SELECTION menu.

To run Online Diagnostics in service mode, take the following steps:

1. Stop all programs including the AIX operating system (get help if needed).

2. Remove all tapes, diskettes, and CD–ROM discs.
3. Turn off the system unit power.
4. Turn on the system unit power.
5. After the first POST indicator appears on the system unit's console, press F6 on the directly–attached keyboard or 6 on the TTY keyboard to indicate that diagnostics are to load.

   Note: The term *POST indicator* refers to the icons (graphic display) or device mnemonics (ASCII terminal) that are displayed while the POST is running.
6. Enter any requested password.
7. Follow any instructions to select a console.
8. After the diagnostic controller loads, DIAGNOSTIC OPERATING INSTRUCTIONS appear on the console display.
9. Follow the displayed instructions to test the desired resources.
10. When testing is complete; use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS.
11. Press the F3 key (from a defined terminal) or press 99 (for an undefined terminal) to shut down the diagnostics before turning off the system unit.

    Note: Pressing the F3 key (from a defined terminal) produces a Confirm Exit menu which offers two options: continuing with the shut down by pressing F3; or returning to diagnostics by pressing Enter.

    For undefined terminals, pressing 99 produces a full screen menu which offers two options: continuing with the shutdown by pressing 99 and then Enter; or returning to diagnostics by pressing Enter.

Running the Online Diagnostics in Concurrent Mode

Use Concurrent mode to run Online diagnostics on some of the system resources while the system is running normal system activity.

Because the system is running in normal operation, the following resources cannot be tested in concurrent mode:

- SCSI adapters connected to paging devices
- Disk drive used for paging
- Any graphics–related device running X, CDE, or windowing environment
- Memory
- Processor.

There are three levels of testing in concurrent mode:

- The **share–test level** tests a resource while the resource is being shared by programs running in the normal operation. This testing is mostly limited to normal commands that test for the presence of a device or adapter.
- The **sub–test level** tests a portion of a resource while the remaining part of the resource is being used in normal operation. For example, this test could test one port of a multiport device while the other ports are being used in normal operation.
- The **full–test level** requires the device not be assigned to or used by any other operation. This level of testing on a disk drive may require the use of the varyoff command. The diagnostics display menus to allow you to vary off the needed resource.

Error log analysis is done in concurrent mode when you select the Problem Determination option on the DIAGNOSTIC MODE SELECTION menu.

To run the Online Diagnostics in concurrent mode you must be logged onto the AIX operating system and have proper authority to issue the commands (if needed, get help).

The `diag` command loads the diagnostic controller and displays the Online Diagnostic menus.

To run Online Diagnostics in concurrent mode, take the following steps:

- Log on to the AIX operating system as root or superuser.
- Enter the `diag` command.
- When the DIAGNOSTIC OPERATING INSTRUCTIONS are displayed, follow the instructions to check out the desired resources.
- When testing is complete; use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS. Then press the F3 key again to return to the AIX operating system prompt. Be sure to vary on any resource you had varied to off.
- Press the Ctrl–D key sequence to log off from root or superuser.

Running the Online Diagnostics in Maintenance Mode

Maintenance mode runs the Online Diagnostics using the customer's version of the AIX operating system. This mode requires that all activity on the AIX operating system be stopped so the Online Diagnostics have most of the resources available to check. All of the system resources except the SCSI adapters, memory, processor, and the disk drive used for paging can be checked.

Error log analysis is done in maintenance mode when you select the Problem Determination option on the DIAGNOSTIC MODE SELECTION menu.

The `shutdown -m` command is used to stop all activity on the AIX operating system and put the AIX operating system into maintenance mode. Then the diag command is used to invoke the diagnostic controller so you can run the diagnostics. After the diagnostic controller is loaded, follow the normal diagnostic instructions.

To run the Online Diagnostics in maintenance mode you must be logged on to the customer's version of the AIX operating system as *root* or *superuser* (su). Use the following steps to run the Online Diagnostics in maintenance mode:

1. Stop all programs except the AIX operating system (if help is needed see the system operator).
2. Log onto the AIX operating system as *root* or *superuser*.
3. Enter the `shutdown -m` command.
4. When a message indicates the system is in maintenance mode, enter the `diag` command.
   Note: It may be necessary to set *TERM* type again.
5. When DIAGNOSTIC OPERATING INSTRUCTIONS is displayed, follow the displayed instructions to checkout the desired resources.
6. When testing is complete; use the F3 key to return to DIAGNOSTIC OPERATING INSTRUCTIONS. Then press the F3 key again to return to the AIX operating system prompt.
7. Press Ctrl–D to log off from *root* or *superuser*.

Standalone Diagnostic Operation

Standalone Diagnostics provide a method to test the system when the Online Diagnostics are not installed and a method of testing the disk drives that cannot be tested by the Online Diagnostics.

Note: Error Log Analysis is not done by the Standalone Diagnostics. If running from the diagnostic CD–ROM disc, the CD–ROM drive and the SCSI controller that controls it cannot be tested by the Standalone Diagnostics.

Running the Standalone Diagnostics

To run Standalone Diagnostics in service mode, use the following steps:

1. Stop all programs including the AIX operating system (get help if needed).
2. Remove all tapes, diskettes, and CD–ROMs.
3. Turn off the system unit power.
4. Turn on the system unit power.
5. Insert the diagnostic media.
6. When the keyboard POST indicator appears, press the F5 key on the directly attached keyboard, or the number 5 key on the TTY keyboard.
7. Enter any requested passwords.
8. Follow any instructions to select the console.
9. After the diagnostic controller loads, DIAGNOSTIC OPERATING INSTRUCTIONS appear on the console display.
10. Follow the displayed instructions to test the desired resources.
11. When testing is complete, use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS.

Chapter 6. Introducing to Tasks and Service Aids

The AIX Diagnostic Package contains programs that are called Tasks. Tasks can be thought of as ”performing a specific function on a resource”; for example, running diagnostics, or performing a service aid on a resource. This chapter refers to the Tasks available in AIX Diagnostics Version 4.2 and later.

Note: Many of these programs work on all system model architectures. Some programs are only accessible from Online Diagnostics in Service or Concurrent mode, others may be accessible only from Standalone Diagnostics. While still other programs may only be supported on a particular system architecture, such as CHRP (Common Hardware Reference Platform). The ESCALA PL 200 is a CHRP architecture.

Use the FUNCTION SELECTION menu to perform tasks.

After a task is selected, a resource menu may be presented showing all resources supported by the task.

You can use a fast path method to perform a task by using the **diag** command and the **–T** flag. The fast path tasks are as follows:

- Certify – certifies media
- Chkspares – checks for the availability of spare sectors
- Download – downloads microcode to an adapter or device
- Disp_mcode – displays current level of microcode
- Format – formats media
- Identify – identifies the PCI RAID physical disks

To run these tasks directly from the command line, specify the resource and other task unique flags. Use the descriptions in ”*Diagnostic Information for Multiple Bus Systems*”, order number 86 A1 26HX, to understand which flags are needed for a given task.

Tasks:

- Add Resource to Resource List
- AIX Shell Prompt
- Analyze Adapter Internal Log
- Backup and Restore Media
- Certify Media
- Change Hardware Vital Product Data
- Configure Dials and LPFKeys
- Configure Reboot Policy
- Configure Remote Maintenance Policy
- Configure Ring Indicate Power On Policy
- Configure Surveillance Policy
- Create Customized Configuration Diskette
- Delete Resource from Resource List
- Disk Maintenance
- Display Configuration and Resource List

- Display Firmware Device Node Information
- Display Hardware Error Report
- Display Hardware Vital Product Data
- Display Machine Check Error Log
- Display Microcode Level
- Display or Change Bootlist
- Display or Change Diagnostic Run Time Options
- Display Previous Diagnostic Results
- Display Resource Attributes
- Display Service Hints
- Display Software Product Data
- Display System Environmental Sensors
- Display Test Patterns
- Download Microcode
- Fibre Channel RAID Service Aids
- Flash SK–NET FDDI Firmware
- Format Media
- Generic Microcode Download
- Hot Plug Task
- Local Area Network Analyzer
- Log Repair Action
- Periodic Diagnostics
- PCI RAID Physical Disk Identify
- Process Supplemental Media
- Run Diagnostics
- Run Error Log Analysis
- Run Exercisers
- Save or Restore Hardware Management Policies
- SCSI Bus Analyzer
- SCSD Tape Drive Service Aid
- Spare Sector Availability
- SSA Service Aid
- Update Disk Based Diagnostics
- Update System or Service Processor Flash
- 7135 RAIDiant Array Service Aids
- 7318 Serial Communication Network Server

Chapter 7. Using the System Verification Procedure

The system verification procedure is used to check the system for correct operation.

When you are analyzing a hardware problem, you should use Chapter 8. ”Hardware Problem Determination”.

Step 1. Considerations before Running This Procedure

Notes:

1. If this system unit is directly attached to another system unit or attached to a network, be sure communications with the other system unit is stopped.
2. This procedure requires use of all of the system resources. No other activity can be running on the system while you are doing this procedure.

Read the following before using this procedure:

- This procedure requires a display connected to the video port or an ASCII terminal attached to the S1 port.
- Before starting this procedure, you should stop all programs and the operating system.
- This procedure runs the Online Diagnostics in Service mode or Standalone Diagnostics. If the Online Diagnostics are installed, they should be run. See the operator manual for your type of ASCII terminal to find the key sequences you need in order to respond to the diagnostics.
- If you need more information about diagnostics see Chapter 5. ”Using the Online and Standalone Diagnostics”.
- If a console display is not selected, the diagnostics stop. The instructions for selecting a console display are displayed on all of the graphic displays and any terminal attached to the S1 port. Follow the displayed instructions to select a console display.
- Go to Step 2.

Step 2. Loading the Diagnostics

1. Stop all application programs running on the operating system.
2. Stop the operating system.
3. Turn the power off.
4. If you are loading the Standalone Diagnostics and running them from an ASCII terminal:
   - The attributes for the terminal must be set to match the defaults of the diagnostics.
   - If you need to change any settings, record the normal settings, and be sure the terminal attributes are set to work with the diagnostics. If needed, see ”Running the Diagnostics from a TTY Terminal” on page 5-6.
   - Return to substep 5 when you finish checking the attributes.
5. Turn the power on.
   a. When the **keyboard** indicator appears, press the numeric 5 key on the keyboard to load the Standalone Diagnostics or the numeric 6 key on the keyboard to load the Online Diagnostics.
   b. Enter any requested passwords.

c. Follow any instructions to select a console.

6. When the Diagnostic Operating Instructions display, go to Step 3. If you are unable to load the diagnostics, go to ”Problem Determination When Unable to Load Diagnostics” on page 8-7.

Step 3. Running System Verification

The Diagnostic Operating Instructions should be displayed.

1. Press the Enter key.
2. If the terminal type has not been defined, you must use the Initialize Terminal option on the Function Selection menu to initialize the operating system environment before you can continue with the diagnostics.
3. If you want to do a general checkout without much operator action, Select the Diagnostic Routines option on the Function Selection menu.

   If you want to do a more complete checkout including the use of wrap plugs, select the Advanced Diagnostics option on the Function Selection menu. The advanced diagnostics are primarily for the service representative; they may instruct you to install wrap plugs to better isolate a problem.
4. Select the System Verification option on the Diagnostic Mode Selection menu.
5. If you want to run a general checkout of all installed resources, Select the All Resource option on the Diagnostic Selection menu.

   If you want to check one particular resource, select that resource on the Diagnostic Selection menu.
6. Go to Step 4.

Step 4. Additional System Verification

The checkout programs end with either the Testing Complete menu and a message stating No trouble was found or the A Problem Was Detected On (Time Stamp) menu with an SRN.

1. Press Enter to return to the Diagnostic Selection menu.
2. If you want to check other resources, select the resource. When you have checked all of the resources you need to check, go to Step 5.

Step 5. Stopping the Diagnostics

1. If running Online diagnostics, the system first should be shut down using the following procedure:

   a. Press F3 repeatedly until you get to the Diagnostic Operating Instructions, then follow the displayed instructions.

   b. Press F3 once, and then follow the displayed instructions to shut down system.
2. If you changed any attributes on your ASCII terminal to run the diagnostics, change the settings back to normal.
3. This completes the system verification. Report the SRN to the service organization if you received one. To do a normal boot, turn off the system unit and wait 30 seconds, and then set the power switch of the system unit to On.

Chapter 8. Hardware Problem Determination

This chapter provides information on using Standalone or Online Diagnostics.

Problem Determination Using the Standalone or Online Diagnostics

Use this procedure to obtain a service request number (SRN) when you are able to load the Standalone or Online Diagnostics. If you are unable to load the Standalone or Online Diagnostics, go to ”Problem Determination When Unable to Load Diagnostics” on page 8-7. The service organization uses the SRN to determine which field replaceable units (FRUs) are needed to restore the system to correct operation.

Step 1. Considerations before Running This Procedure

Note: See the operator manual for your ASCII terminal to find the key sequences you need to respond to the diagnostic programs.

- The diagnostics can use a display connected to the video port or an ASCII terminal attached to a serial port.
- This procedure asks you to select the type of diagnostics you want to run. If you need more information about the types, see ”Standalone and Online Diagnostics Operating Considerations” on page 5-1.
- Go to ”Step 2”.

Step 2

Is the Attention LED on?

NO	Go to ”Step 3.
YES	Go to ”Attention LED and Lightpath LED” on page 2-2.

Step 3

Are the Online Diagnostics installed on this system?

NO	Go to “Step 16”.
YES	Go to ”Step 4”.

Step 4

Determine if the operating system is accepting commands.

Is the operating system accepting commands?

NO	The system must be turned off in order to run diagnostics. Verify with the system administrator and users that the system may be turned off. If so, then turn off the system unit and go to Step 7.
YES	Go to ”Step 5”.

Step 5

Diagnostic tests can be run on many resources while the operating system is running. However, more extensive problem isolation is obtained by running Online Diagnostics in Service mode.

Do you want to run the Online Diagnostics in Service mode?

NO	Go to ”Step 6”.
YES	Do the following to shut down your system:

1. At the system prompt, stop the operating system using the proper command for your operating system. For AIX systems, use the `shutdown -F` command.
2. After the operating system is stopped, turn off the system unit.
3. Go to ”Step 7”.

Step 6

This step starts the Online Diagnostics in concurrent mode.

1. Log on as `root` user.
2. Enter the `diag` command.
3. Wait until the Diagnostic Operating Instructions are displayed, or wait for three minutes.

Are the Diagnostic Operating Instructions displayed without any obvious console display problems?

NO	Do the following to shut down your system:

1. At the system prompt, stop the operating system using the proper command for your operating system. For AIX systems, use the `shutdown -F` command.
2. After the operating system is stopped, turn off the system unit.
3. Go to ”Step 7”.

YES	Go to ”Step 10”.

Step 7

This step loads Online Diagnostics in service mode. If you are unable to load the diagnostics, go to ”Step 8”.

1. Turn the power on.
2. When the keyboard indicator (icon or text) appears, press the numeric 6 key on the keyboard to indicate that diagnostics are to be loaded.
3. Enter any requested passwords.
4. Follow any instructions to select a console.

Did the Diagnostics Operating Instructions display without any obvious display problem?

NO	Go to ”Step 8”.
YES	Go to ”Step 10”.

Step 8

Starting at the top of the following table, find your symptom and follow the instructions given in the Action column.

Symptom	Action
Display problem.	Go to ”Step 9”.
All other symptoms.	Go to ”Problem Determination When Unable to Load Diagnostics” on page 8-7

Step 9

The following steps analyze a console display problem.

Find your type of console display in the following table, then follow the instructions given in the Action column.

Console Display	Action
Display Device	Go to the display documentation for problem determination.
ASCII terminal	Go to the documentation for problem determination for this type of terminal.

Step 10

The diagnostics loaded correctly.

Press the Enter key.

Is the Function Selection menu displayed?

NO	Go to ”Step 11”.
YES	Go to ”Step 12”.

Step 11

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
101–key keyboard. Identify by the type of Enter key used. The Enter key is within one horizontal row of keys.	Record error code M0KBD001 and report the problem to the service organization.
102–key keyboard. Identify by the type of Enter key used. The Enter key extends into two horizontal rows of keys.	Record error code M0KBD002 and report the problem to the service organization.
Kanji keyboard. Identify by the Japanese characters.	Record error code M0KBD003 and report the problem to the service organization.
ASCII–terminal keyboard. This applies to all attached terminals.	Go to the documentation for problem determination for this type terminal.

Step 12

1. If the terminal type has not been defined, you must use the `Initialize Terminal` option on the Function Selection menu to initialize the operating system environment before you can continue with the diagnostics. This is a separate and different operation than selecting the console display.
2. Select `Diagnostic Routines`.
3. Press the Enter key.
4. In the following table, find the menu or system response you received when you selected `Diagnostics`. Follow the instructions given in the Action column.

System Response	Action
The Diagnostic Mode Selection menu is displayed.	Select Problem Determination and go to ”Step 13”.
The Missing Resource menu is displayed.	Follow the displayed instructions until either the Diagnostic Mode Selection menu or an SRN is displayed. If the Diagnostic Mode Selection menu is displayed, select Problem Determination and go to ”Step 13”. If you get an SRN, record it, and go to ”Step 15”.

The New Resource menu is displayed.	Follow the displayed instructions. Note: Devices attached to serial ports S1 or S2 will not appear on the New Resource menu. Also, ISA adapters do not appear unless they have been identified and configured. If the Diagnostic Mode Selection menu is displayed, select Problem Determination and go to ”Step 13”. If you get an SRN, record it, and go to ”Step 15”. If you do not get an SRN, go to ”Step 18”.
The system does not respond to selecting diagnostics	Go to ”Step 11”.

Step 13

Did the Diagnostic Selection Menu display?

NO	If Problem Determination was selected from the Diagnostic Mode Selection menu, and if a recent error has been logged in the error log, the diagnostics automatically begin testing the resource. Follow the displayed instructions. If the No Trouble Found screen is displayed, press Enter. If another resource is tested, repeat this step. If the Diagnostic Selection menu is displayed, go to ”Step 14”. If an SRN is displayed, record it, and go to ”Step 15”.
YES	Go to ”Step 14”.

Step 14

The All Resources option checks most of the configured adapters and devices.

Select and run the diagnostic tests on the resources you are having problems with or select the All Resources option check all of the configured resources. Find the response in the following table and take the Action for it.

Diagnostic Response	Action
An SRN is displayed.	Go to ”Step 15”.
The system hangs.	Report SRN 109–200.
The Testing Complete menu and the No trouble was found message is displayed, and you have not tested all of the resources.	Press Enter and continue with the testing.
The Testing Complete menu and the No trouble was found message displayed and you have tested all of the resources.	Go to ”Step 18”.

Step 15

The diagnostics produced an SRN for this problem.

1. Record the SRN and other numbers read out.
2. Report the SRN to the service organization.
3. **STOP**. You have completed these procedures.

Step 16

When you are loading the Standalone Diagnostics, the attributes for the terminal must be set to match the defaults of the diagnostic programs. The ASCII terminal must be attached to serial port 1 on the system unit.

Are you going to load Standalone Diagnostics and run them from a ASCII terminal?

NO	Go to ”Step 17”.
YES	Go to ”Running the Diagnostics from a TTY Terminal” on page 5-6 and be sure your terminal attributes are set to work with the diagnostic programs. Return to ”Step 17” when you finish checking the attributes. Record any settings that are changed.

Step 17

This step loads the Standalone Diagnostics. If you are unable to load the diagnostics, go to ”Step 8”.

1. Turn the power on.
2. Insert the diagnostic CD–ROM into the CD–ROM drive.
3. When the keyboard indicator appears, press the numeric 5 key on the keyboard to indicate that diagnostics are to be loaded.
4. Enter any requested passwords.
5. Follow any instructions to select a console.

Did the Diagnostics Operating Instructions display without any obvious display problem?

NO	Go to ”Step 8”.
YES	Go to ”Step 10”.

Step 18

The diagnostics did not find a hardware problem. If you still have a problem, contact your software support center.

Problem Determination When Unable to Load Diagnostics

Use this procedure to obtain an error code. The service organization uses the error code to determine which field replaceable units (FRUs) are needed to restore the system to correct operation.

Step 1. Considerations before Running This Procedure

- The diagnostics can use a display connected to the video port or an ASCII terminal attached to a serial port.
- Go to ”Step 2”.

Step 2

Are the Online Diagnostics installed on this system?

NO	Go to ”Step 4”.
YES	Go to ”Step 3”.

Step 3

This step attempts to load Online Diagnostics in service mode.

1. Turn the power off.
2. Turn the power on.
3. If the keyboard indicator appears, press the numeric 6 key on keyboard to indicate that diagnostics are to be loaded.
4. Enter any requested passwords.
5. Follow any instructions to select a console.
6. Wait until the diagnostics load or the system appears to stop.

Did the diagnostics load?

NO	Go to ”Step 5”.
YES	Go to ”Step 6”.

Step 4

This step attempts to load the Standalone diagnostics.

1. Turn the power off.
2. Turn the power on.
3. Insert the diagnostic CD–ROM into the CD–ROM drive.
4. If the keyboard indicator appears, press the numeric 5 key on the keyboard to indicate that diagnostics are to be loaded.
5. Enter any requested passwords.
6. Follow any instructions to select a console.
7. Wait until the diagnostics load or the system appears to stop.

Did the diagnostics load?

NO	Go to ”Step 5”.
YES	Go to ”Step 6”.

Step 5

Starting at the top of the following table, find your symptom and follow the instructions given in the Action column.

Symptom	Action
The power LED does not come on, or comes on and does not stay on.	Check the power cable to the outlet. Check the circuit breakers and check for power at the outlet. Assure the room temperature is within 60 – 90°F. If you do not find a problem, record error code M0PS0000 and report the problem to the service organization.
The system appears to be stopped and NO beep was heard from the system unit.	Processor POST failure. Report error code M0CPU000.
The system appears to be stopped and NO beep was heard from the system unit. E122, E123, or E124 is displayed on the operator panel display.	No good memory could be found. Report error code M0MEM000.
The system appears to be stopped. A beep was heard from the system unit.	No good memory could be found. Report error code M0MEM001.
The diagnostics are loaded and there was NO beep heard from the system unit during the IPL sequence.	Record error code M0SPK001.
The system stops with the Diagnostic Operating Instructions displayed.	Go to Step 6.
The diskette LED is blinking rapidly, or E1EA or E1EB is displayed on the operator panel.	The flash EPROM data is corrupted. Run the recovery procedure for the flash EPROM.

Symptom	Action
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, wait for one of the other conditions to occur.
The system stops with an eight–digit error code(s) displayed on the console.	Record the error code(s) and report the problem to the service organization.
The system login prompt is displayed.	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 boot of diagnostic programs. If this was the case, start over at the beginning of this step. If you are sure that you pressed the correct key in a timely manner, go to Step 7.
The system does not respond when the password is entered.	Go to Step 7.
The system stopped and an indicator is displayed on the system console and an eight–digit error code is not displayed.	If the indicator (text or icon) represents: A keyboard, record error code M0KBD000 and report the problem to the service organization. • Memory, record error code M0MEM002 and report the problem to the service organization. • SCSI, record error code M0CON000 and report the problem to the service organization. • Network, record error code M0NET000 and report the problem to the service organization. • Speaker/Audio, record error code M0BT0000 and report the problem to the service organization.
The System Management Services menu is displayed.	The device or media that you are attempting to boot from might be faulty. 1 Check the SMS error log for any errors. To check the error log: – Select **tools** – Select **error log** – If an error is logged, check the time stamp. – If the error was logged during the current boot attempt, record it and report it to your service representative. – If no recent error is logged in the error log, continue to the next step below. 2 If you are attempting to load the Online Diagnostics, try loading the Standalone Diagnostics. Otherwise, record error code M0SCSI01 and report the problem to the service organization.

Symptom	Action
The system appears to be stopped, the disk activity light is on continuously, and a beep was heard from the system unit	Record error code M0MEM001 and report the problem to the service organization.
The system stops with the message `STARTING SOFTWARE PLEASE WAIT` displayed	Report error code M0BT0000.
The message `The system will continue the boot process` is displayed continuously on the system unit's console.	Report error code M0SCSI01.

Step 6

The diagnostics loaded correctly.

Go to "Problem Determination Using the Standalone or Online Diagnostics" on page 8-1.

Step 7

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
101–key keyboard. Identify by the type of Enter key used. The Enter key is within one horizontal row of keys.	Record error code M0KBD001 and report the problem to the service organization.
102–key keyboard. Identify by the type of Enter key used. The Enter key extends into two horizontal rows of keys.	Record error code M0KBD002 and report the problem to the service organization.
Kanji keyboard. Identify by the Japanese characters.	Record error code M0KBD003 and report the problem to the service organization.
ASCII–terminal keyboard. This applies to all attached terminals.	Go to the documentation for problem determination for this type terminal.

Chapter 9. Repair Action

This chapter describes the steps to replace a failing component and reset the LEDs on the indicator panel..

1. 1.Replace the failing component with the new component. Refer to Chapter 3 of the *Installation Guide* for instructions.
2. Log in as root user.
3. At the command line, type `diag`.
4. Select **Task Selection**.
5. Select **Log Repair Action**.
6. Select the device that was repaired. (If the device is not listed, select sysplanar0).

If the Attention LED remains on after you have completed the repair action and reset the LEDs, call for service.

Appendix A. Firmware Updates

This section provides information and instruction for updating firmware. You may need to perform these steps if you are installing an option or if your support representative has instructed you to update your firmware.

Check the Current Firmware Levels

To verify the current levels that are installed on the system, use the following steps:

1. Log in as root user.
2. Type the following at the command line:

```
lscfg -vp | grep -p alterable
```

3. Press Enter. This command produces a report similar to the following:

```
ROM Level . (alterable) .ct010507 <===service processor F/W level
ROM Level . (alterable) .CLT01198 <===system firmware level
```

Notes:

1. In the preceding example, if the current version of service processor firmware is ct010507, the last six characters of the ROM level represent a date in a `yymmdd` format, where `yy` is the last two digits of the year, `mm` is the month and `dd` is the day of the firmware (Julian date).
2. Also in the preceding example, if the current version of system firmware is CLT01198, the last five characters of the ROM level represent a date in a `yyddd` format, where `yy` is the last two digits of the year and `ddd` is the Gregorian date of the firmware.

Contact your service support representative for the latest level of downloadable firmware. If the version of system firmware installed on your system is older than (has an earlier date than) the system firmware shown on the web site, you should consider downloading and applying the update. If the version of service processor firmware installed on your system is older than (has an earlier date than) the service processor firmware shown on the Web site, consider downloading and applying the update.

System Firmware Updates

To update the system firmware, perform the following steps:

1. Log in as root user.
2. If the directory /**tmp**/**fwupdate** does not exist, create it by issuing the following command: `mkdir /tmp/fwupdate`
3. The firmware update file must be written into the /**tmp**/**fwupdate** directory on the . This can be done by using the **ftp** command to get the image from an ftp server, NFS–mounting the directory on the host serverContact your sales or service representative for assistance.

   After the firmware update file has been written into the /**tmp**/**fwupdate** directory, verify its existence by entering the following command:

```
ls /tmp/fwupdate/cc*.img
```

   The update file name will have the format *yydddcc.img*. The *cc* indicates that this is a combined image for a server, *yy* is the last two digits of the year, and *ddd* is the Julian date of the update file.

4. After the update file has been written to the /tmp/fwupdate directory, enter the following commands:

```
cd /usr/lpp/diagnostics/bin
```

   then

```
./update_flash -f /tmp/fwupdate/yydddcc.img
```

Notes:

   a. `yydddcc.img` is the file you identified in the previous step.

   b. Make sure that you include the periods (.) in the commands shown above.

   c. AIX commands are case–sensitive. Type them exactly as shown.

   You are asked by the system for confirmation to proceed with the firmware update and the required reboot. If you confirm, the system applies the new firmware, reboots, and returns to the AIX prompt. This may take up to ten minutes, depending on the configuration of the system.

   Attention: On some systems, the message `Wait for rebooting before stopping` may appear on the system display. *Do not* turn off the system unit until the system has fully rebooted to the AIX login prompt. If a shutdown is necessary at that time, log in as root user and issue the **shutdown** command. While the update is in progress, you will see `Rebooting...` on the display for as long as three minutes.

The firmware update is complete.

Appendix B. Service Processor Setup and Test

For your convenience, a sample SP 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. Unplug the power cord from the server.
2. Attach a local terminal for this setup procedure.
3. Plug in the server and power on the local terminal.

   ATTENTION: Make sure that server power remains off
4. Bring up the Service Processor Menus, see ”Using the Service Processor” on page 3-1.
5. Set the System Name, see ”Privileged User Menus” on page 3-5.
6. Enable Surveillance. See ”Service Processor Functions”, on page 3-21
7. Configure Call–In/Call–Out, see ”Call–In/Call–Out Setup Menu” on page 3-16.
8. Exit the Service Processor menus
9. Unplug the power cord from the server.
10. Attach modems (if needed). See page 3-3.
11. Plug in the server

    ATTENTION: Make sure that server power remains off
12. Test both of the following:
    - Call–In, on page B-2.
    - Call–Out, on page B-2.

Your Service Processor is ready for use.

Testing the Service Processor Setup

The following is a sample testing procedure to ensure your setup is working.

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 B-3.

The server should still be powered off as a result of the setup checklist steps on page B-1.

Testing Call–In

1. Go to your remote terminal and call in to your server. Your server answers and offers you the Service Processor Main Menu after requesting your privileged access password.
2. Select System Power Control.
3. Select Power–On System.

   When you are asked if you wish to continue powering on the system, type Y.
4. After the system firmware and operating system have initialized the server, the login prompt displays at your remote terminal if you set up Seamless Modem Transfer (refer to page "Transfer of a Modem Session", on page C-5 for more information). This may take several minutes. When the login prompt displays, you have successfully called the Service Processor.
5. Type `logout` to disconnect from the operating system. The message `No Carrier` displays on your remote terminal.
6. Call your server again. The operating system answers and offers you the login prompt.

   If these tests are successful, call–in is working.
7. Login in and type `shutdown -F` to shut down your server.
8. The message `No Carrier` displays on your remote terminal.

Testing Call–Out

During the setup, you entered **your** phone number for the Pager (on page 3-18) and Customer Voice (on page 3-19) phone numbers. These numbers are used for this test.

1. Your remote terminal is disconnected as a result of the Call–In test.
2. Call your server again.
3. At the Service Processor Main Menu, select Call–In/Call–Out Setup menu, then select Call–Out test. This action causes a simulated error condition for the purposes of this test.
4. After a few moments, a message displays, regarding an illegal entry. Press Enter to clear the message and return to the main menu.
5. 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.

Return to the "Telephone Number Setup Menu" on page 3-18 to enter the **actual** telephone numbers your server will use 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.

Appendix C. Modem Configurations

The SP is designed to place little demand on an attached modem, thereby increasing the setup and connection success rates.

Sample Modem Configuration Files

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 system 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

Use the following steps to select a configuration file:

1. Does your modem respond to the extended command set (prefixed with &)?

   If yes, go to step 3 below.
   If no, continue with step 2 below.

2. 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 5 below.

3. 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 C-3. Go to step 5.

   If no, go to step 4 below.

4. 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.

5. You have completed selection of the configuration file.

   If your modem configuration selection is not available in the Service Processor Modem Configuration Menu, you must access it through the Configure Remote Maintenance Policy Service Aid.

   If you find it necessary to adjust any of these configuration files, do so with reference to the manual that came with your modem. 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.

Some modems are not designed for the paging function. Although they can be used for paging, they 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 causes 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.

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				
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.

To disable Auto–Reliable Mode testing of the remote modem, use the sample modem configuration file **/usr/share/modems/modem_f.cfg** as a model that you can modify, as follows:

1. Find the necessary command in your modem manual.
2. Copy the **/usr/share/modems/modem_f.cfg** file to a new file with a different name (for example, **modem_fx.cfg**).
3. In the new file (**modem_fx.cfg**), change the line `Send "ATE0T\r"` to `Send "ATcccE0T\r"` where ccc is the added command as specified in your modem manual, as follows.

   Change the third line of each of the following stanzas:

   - `condout`
   - `condin`
   - `ripo`

4. Save the changes.

Xon/Xoff Modems

Some early modems assume software flow control (Xon/Xoff) between the computer and the modem. Modems with this design send extra characters during and after the transmitted data. The Service Processor cannot accept these extra characters. If your configuration includes such a modem, your functional results may be unpredictable.

The sample modem configuration files included in this appendix do not support these modems, so custom configuration files are necessary. Anchor Automation 2400E is an example of such a modem.

If you experience unexplainable performance problems that may be due to Xon/Xoff characters, it is recommended that you upgrade your modem.

Ring Detection

Most modems produce an interrupt request each time they detect a ring signal. Some modems generate an interrupt only on the first ring signal that they receive. AT&T DataPort 2001 is an example of such a modem.

The Service Processor uses the ring interrupt request to count the number of rings when Ring Indicate Power–On (RIPO) is enabled. If your modem produces an interrupt on only the first ring, set Ring Indicate Power–On to start on the first ring. Otherwise, you can choose to start Ring Indicate Power–On on any ring count.

Terminal Emulators

The SP 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 SP 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

Situations such as 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, 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, shut down your system using established procedures. Disconnect the power cable and press the power button to drain capacitance while power is disconnected. Disconnect and reconnect modem power, and then reconnect system power to completely reinitialize your system.

Transfer of a Modem Session

Because many modem command variations exist, the sample modem configuration files that follow 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.

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, as follows:

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.

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 **two** 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 into the Service Processor and start the system. After the operating system is loaded and initialized, the connection will be dropped. At this

point, call the server back and the operating system will answer and offer 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_m0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP: modem_m0
#
# FUNCTIONS: Modem configuration file specifically for IBM 7852–400
#  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 "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&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=2\r"                   # Numberic response code
                                            # Answer on 2nd ring
        expect "0\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 "0\r" timeout 60             # Confirm successful command.
        delay 2                             # Wait before hanging up.
        send "ATH0\r"                       # Hang up.
        expect "0\r" timeout 2              # Confirm successful command.
        done

ripo:       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 successful command.
        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" 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_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
DefaultTO 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 ”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

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
DefaultTO 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&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=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&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                                    # 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
DefaultTO 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 ”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&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

ripo:     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
DefaultTO 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_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 ”ATV0X0S0=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
            expect "0\r" timeout 2          # Confirm commands 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 "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
            expect "0\r" or "3\r" timeout 30    # Confirm successful command.
            delay 2                         # Wait before hanging up.
            send "+++"                      # Assure command mode.
            delay 2                         # Allow mode switching delay.
            send "ATH0\r"                   # Hang up.
            expect "0\r" timeout 2          # Confirm successful command.
            done

ripo:       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
            expect "0\r" timeout 2          # Confirm commands successful.
            done                            #

error:                                      # Handle unexpected modem
                                            #  responses.
            expect "8\r" or "7\r" or "4\r" or "3\r"
            delay 2
            done
```

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
DefaultTO 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 "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

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
DefaultTO 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 ”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
```

```
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
DefaultTO 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&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=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&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                            # 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
DefaultTO 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 ”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&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

ripo:    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
DefaultTO 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
```

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