



7043 Model 260

SA38-0553-00

User's Guide

First Edition (October 1998)

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Thank You!

Dear RS/6000 Customer:

Thank you for selecting a member of the IBM RS/6000 product family. In the selection of computing solutions, we know you have many choices. We are delighted you decided to join the RS/6000 team.

We worked with professionals like you from the beginning of the development of this product to understand your computing needs today and in the future. Many of our design decisions, from packaging containers to subtle features of the architecture, were based on these personal conversations and feedback sessions. Our goal is to deliver high performance, flexible solutions with superior reliability. We hope this system delivers on all of these objectives and exceeds your personal expectations.

We value your suggestions and comments as we work to continually improve the IBM product family. Please feel free to contact your IBM representative or IBM Business Partner or to send an e-mail message to askibm@info.ibm.com.

Sincerely,

RS/6000 Team

The RS/6000 Development Team

Contents

Communications Statements	ix
Federal Communications Commission (FCC) Statement	ix
European Union (EU) Statement	x
International Electrotechnical Commission (IEC) Statement	x
United Kingdom Telecommunications Safety Requirements	x
Avis de conformité aux normes du ministère des Communications du Canada	xi
Canadian Department of Communications Compliance Statement	xi
VCCI Statement	xi
Radio Protection for Germany	xi
Safety Notices	xiii
Electrical Safety	xiii
Unit Emissions	xiv
Laser Safety Information	xv
Environmental Notices	xvii
Product Recycling and Disposal	xvii
Battery Return Program	xvii
Environmental Design	xvii
About This Book	xix
ISO 9000	xix
Related Publications	xix
Trademarks	xix
Chapter 1. System Startup	1-1
Before You Begin	1-2
Unpacking Your System Unit	1-3
Preinstallation Checklist	1-3
Installing Options	1-4
Setting up your System Unit	1-4
Record your System Unit Identification Numbers	1-5
Finishing the Installation	1-6
System Features	1-7
Chapter 2. Using the System Unit	2-1
Starting the System Unit	2-1
Stopping the System Unit	2-1
Reading the Operator Panel Display	2-2
Using the Keyboards	2-3
Using the Three-Button Mouse	2-5

Using the 3.5-Inch Diskette Drive	2-9
Using the CD-ROM Drive	2-11
General Information for the 8mm Tape Drive	2-16
Using the 8mm Tape Drive	2-21
General information for the 12/24GB 4mm Tape Drive	2-27
Using the 12/24GB 4mm Tape Drive	2-28
Using the Service Processor and Service Director Features	2-39
Chapter 3. System Management Services	3-1
Graphical System Management Services	3-1
Config	3-4
MultiBoot	3-5
Utilities	3-8
Password	3-10
Error Log	3-15
R IPL	3-16
SCSI ID	3-20
Firmware Update	3-21
Text-Based System Management Services	3-23
Display Configuration	3-25
MultiBoot Menu	3-26
Utilities	3-29
Select Language	3-38
Chapter 4. Installing Options	4-1
Safety Considerations	4-1
Handling Static-Sensitive Devices	4-2
Stopping the System Unit	4-3
Removal of Covers	4-4
Removal of Processor and Memory Card Cover	4-9
Replacement of Processor and Memory Card Cover	4-9
Option List	4-10
Removing Memory Cards	4-13
Installing Memory Modules	4-16
Removing Memory Modules	4-18
Removing Processor Card	4-22
Installing Adapter Cards	4-24
Removing Adapter Cards	4-25
Internal Drives	4-26
Installing Disk Drives	4-27
Removing Disk Drives	4-29
Configuration of Media Drives	4-31
Removing a CD-ROM Drive, Tape Drive, Diskette Drive	4-34
Replacement of Covers	4-36

Chapter 5. Using the Stand-alone and Online Diagnostics	5-1
Sources for the Diagnostic Programs	5-1
Stand-alone and Online Diagnostics Operating Considerations	5-1
Online Diagnostics Mode of Operation	5-4
Running the Online Diagnostics in Service Mode (Service Mode IPL)	5-4
Stand-alone Diagnostic Operation	5-7
Location Codes	5-9
Chapter 6. Introduction to Diagnostic Tasks and Service Aids	6-1
Chapter 7. Using the System Verification Procedure	7-1
Chapter 8. Hardware Problem Determination	8-1
Problem Determination Using the Stand-alone or Online Diagnostics	8-1
Problem Determination When Unable to Load Diagnostics	8-10
Appendix A. System Records	A-1
Record the Identification Numbers	A-1
Device Records	A-2
Appendix B. General Attributes Required When Using a TTY Terminal	B-1
Appendix C. Service Processor Information	C-1
Service Processor Menus	C-3
General User Menus	C-4
Privileged User Menus	C-6
Service Processor Functions and Features	C-26
Service Processor Operational Phases	C-39
Service Processor Procedures in Service Mode	C-41
Modem Configurations	C-42
Appendix D. Replacing the Battery	D-1
Removal of Battery	D-1
Replacement of Battery	D-3
Index	X-1
Reader's Comments — We'd Like to Hear From You	X-3

Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

Federal Communications Commission (FCC) Statement

Note: The 7043 Model 260 been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from authorized dealers. Neither the provider nor the manufacturer are responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

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

Responsible Party:

International Business Machines Corporation
New Orchard Road
Armonk, New York 10504
Telephone: (919) 543-2193

European Union (EU) Statement

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

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

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

Avis de conformité aux normes du ministère des Communications du Canada

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

Canadian Department of Communications Compliance Statement

This Class B digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

VCCI Statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

The following is a summary of the VCCI Japanese statement in the box above.

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

When used near a radio or TV receiver, it may become the cause of radio interference.

Read the instructions for correct handling.

Radio Protection for Germany

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

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.

Safety Notices

A *danger* notice indicates the presence of a hazard that has the potential of causing death or serious personal injury.

A *caution* notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury.

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

DANGER

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

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).

Laser Safety Information

The optical drive in this system unit is a laser product. The optical drive has a label that identifies its classification. The label, located on the drive, is shown below.

CLASS 1 LASER PRODUCT LASER KLASSE 1 LUOKAN 1 LASERLAITE APPAREIL À LASER DE CLASSE 1 IEC 825:1984 CENELEC EN 60 825:1991

The optical drive in this system unit is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, the drive is certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 (1st edition 1984) and CENELEC EN 60 825:1991 for Class 1 laser products.



CAUTION:

A class 3 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.

Class 1 laser products are not considered to be hazardous. The optical drive contains internally a Class 3B gallium-arsenide laser that is nominally 30 milliwatts at 830 nanometers. The design incorporates a combination of enclosures, electronics, and redundant interlocks such that there is no exposure to laser radiation above a Class 1 level during normal operation, user maintenance, or servicing conditions.

Environmental Notices

Product Recycling and Disposal

Components of the system unit, such as structural parts and circuit cards, can be recycled where recycling facilities exist. Companies are available to disassemble, reuse, recycle, or dispose of electronic products. Contact your account representative for more information. This system unit contains batteries and circuit boards with lead solder. Before you dispose of this unit, these batteries and circuit boards must be removed and discarded according to local regulations or recycled where facilities exist. This book contains specific information on each battery type where applicable.

Battery Return Program

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

Environmental Design

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

About This Book

This book provides information on how to install and remove options, use the system, use diagnostics, use service aids, and verify system operation. This book also provides information to help you solve some of the simpler problems that might occur.

ISO 9000

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

Related Publications

The following publications provide additional information about your system unit:

- The *7043 Model 260 Service Guide* contains reference information, maintenance analysis procedures (MAPs), error codes, removal and replacement procedures, and a parts catalog.
- The *Diagnostic Information for Multiple Bus Systems* contains diagnostic information, service request numbers (SRNs), and failing function codes (FFCs).
- The *Adapter, Device, and Cable Information for Multiple Bus Systems* contains information about adapters, devices, and cables for your system. This manual is intended to supplement the service information found in the *Diagnostic Information for Multiple Bus Systems*.
- The *Site and Hardware Planning Guide* contains information to help you plan your installation.

Trademarks

- AIX is a registered trademark of the International Business Machines Corporation.
- PowerPC is a trademark of the International Business Machines Corporation.

Chapter 1. System Startup

Thank you for selecting a 7043 Model 260 system!

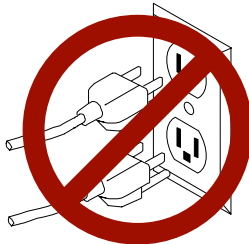
The 7043 Model 260 provides an affordable 64-bit symmetric multi-processing (SMP) solution with true multi-threaded application support, extended floating point capabilities, and the function and performance to do both design and analysis on one platform.

This book helps you set up and use the system, install and remove options, configure the system, and use the system programs that are provided. This book also provides information to help you solve some of the simpler problems that might occur, and how to obtain assistance and service. Appendix A, "System Records" on page A-1 provides a section for you to record all the important information about your system.

Before You Begin

- Make sure you have an adequate number of properly grounded electrical outlets for your system, display, and any other options you intend to install.
- Place your system in a location that is dry. This system, with its tape and disk drive components, operates in a environment having a non-condensing humidity range between 8% and 80%, with the wet-bulb temperature of 23 degrees C (73 degrees F).
- Operating temperature range is from 16 degrees C to 32 degrees C (60 degrees F to 90 degrees F).
- The smaller the variation of temperature and humidity within their operating ranges, the longer life of the system and its components. The room in which your system is installed should be tuned for optimum human and system comfort levels to promote reliability (25 degrees C, 45% relative humidity). If these levels are exceeded, you may experience system failures or emergency power-off warnings.
- Always operate your system in the upright position and do not place any heavy objects on top of your system.
- Collect the following tools, and keep them handy:
 - Small flat-blade screwdriver
 - Medium flat-blade screwdriver
 - Trays to hold screws
 - Optional tools:
 - 4.0 mm nutdriver
 - 5.0 mm nutdriver
 - 5.5 mm nutdriver
 - screw starter
- Before continuing, refer to the *System Unit Safety Information* book for Danger and Caution notices. Do not plug any cables into system unit, adapters, or electrical outlets until you have reviewed this information.

Make sure none of the power cords are connected before continuing.



Unpacking Your System Unit

CAUTION:

Because this system's weight ranges from 37 kg to 45 kg (80 lb to 97 lb), to avoid possible injury, three people or more are required to move the system. Any lifting of the system must be done with some means of mechanical assist.

1. Remove the top cover of the system unit carton.
2. Slide the system unit off of the carton base.

Preinstallation Checklist

After you unpack your system unit and optional devices, make sure you have the following items:





- System unit
- System unit power cord
- ASCII terminal (optional)
- Keyboard and keyboard cable (optional)
- Display, display cable, and display power cord (optional)
- Mouse (optional)
- System unit manuals and media (for example, CD-ROM)
- Any options you want to install (adapter cards, media drives, etc.)
- Adequate power outlets
- Adequate networking outlets and cables

Contact your authorized reseller or marketing representative if any items are missing or damaged.

Installing Options

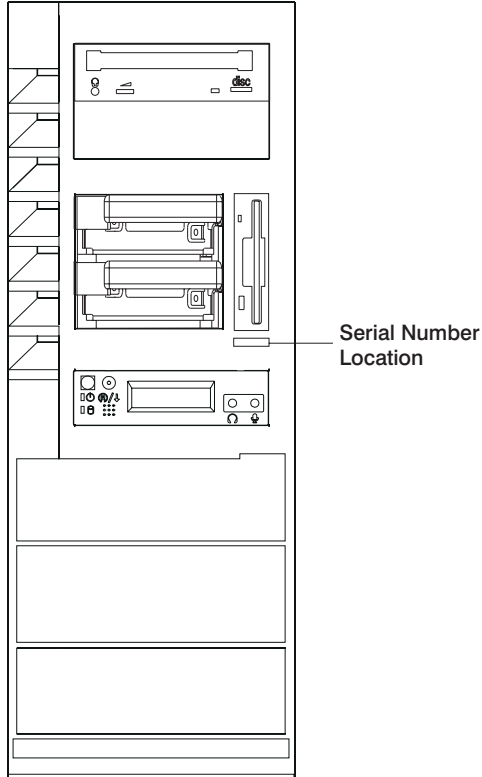
If you have any options that you want to install in your system unit (adapter cards, media drives, etc.) you should do so at this time. Refer to Chapter 4, "Installing Options" on page 4-1 for more information on installing options.

Setting up your System Unit

1. If you are using a keyboard, attach the keyboard cable to the keyboard connector ().
2. If you are installing a mouse, connect that cable to the mouse connector ().
3. If you are installing a tablet, connect that cable to the tablet connector ().
4. If you are using a display, attach the display to the display connector on the back of the display adapter in one of the expansion slots. See the *About Your Machine* document for information on preinstalled adapters.
5. If you are using an ASCII terminal, connect the terminal to serial port 1 ().
6. If you are connecting your system unit to a network, attach the network cable to the appropriate connector at the back of the system unit. Confirm that the network cable is properly connected to your network.
7. Connect the display or ASCII terminal power cord to the display or ASCII terminal.
8. Attach adapter cables to any adapters installed in the expansion slots. See the *About Your Machine* document for information on preinstalled adapters. For more instructions on adapter cabling, see the documentation that came with your adapter, or see the & adc..
9. Connect the system power cord to the power connector. Secure all these connections, then plug the display power cord and the system power cord into properly grounded electrical outlets.

Record your System Unit Identification Numbers

You should retain your system unit serial number for your records. Your system unit serial number is located on the front of the system unit as shown in the picture below. Appendix A, "System Records" on page A-1 provides space to record this and other system unit information.



Finishing the Installation

Important

Be sure to maintain at least 51 mm (2 inches) of space for the left and right sides, 76 mm (3 inches) for the front, and 152 mm (6 inches) for the rear of the system, to allow the cooling system to work properly. Blocking the air vents can cause overheating, which might result in a malfunction or permanent damage.

Your system unit is now set up, and you are ready to start up your system unit and configure or install system software. Use the following checklist as a guide.

1. Install the Operating System

If you plan to install AIX on your system unit yourself, refer to the AIX Quick Installation and Startup Guide for instructions.

2. Configure AIX

If AIX is preinstalled in your system unit, you may start up your system unit now by pressing the power button on the operator panel. Refer to the AIX Quick Installation and Startup Guide for instructions on configuring and starting AIX on your system unit.

3. Install Device Drivers

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

4. Install application programs

To install application programs on your system unit, follow the instructions supplied with each application program.

Congratulations! Your system unit is now set up and ready to use.

System Features

Bus Architecture

Five PCI slots are available:

- Two - 64-bit PCI full size slots at 50 Mhz (Can also run at 33Mhz), 5 volts, one of which is double wide.
- Three - 32-bit PCI full size slots at 33 Mhz, 5 volts.

Microprocessor

- Up to two 200MHz {pertPc 630 microprocessors with 32KB instruction, 64KB data and 4MB in-line L2 cache.

Memory

- 128MB (minimum) - 4GB (maximum).¹

Media Drives

- Standard 3.5-inch, 1.44MB Diskette Drive.
- Internal Hard Disk Drives:
 - 9.1 GB Ultra SCSI Drive.
 - 18 GB Ultra SCSI Drive.
- 32x speed CD-ROM drive with sliding tray (no caddy required).

Other Drives

- Drive bays can accommodate 5.25-inch or 3.5-inch drives such as hard disk drives, CD-ROM drives, tape drives or other removable media drives.

Power Supply

- 640-watt, usable with 100-127 Vac (low voltage) or 200-240 Vac (high voltage). (high voltage).

¹

- Up to two memory cards with 16 memory-modules sockets per each, for 32MB or 128MB dual inline memory-modules, (must be installed in matched pairs).

Keyboard

- Standard: 101-key Enhanced Keyboard
- 101/102 or 106 Enhanced Keyboard

Mouse

- 3-button

Operator Panel

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

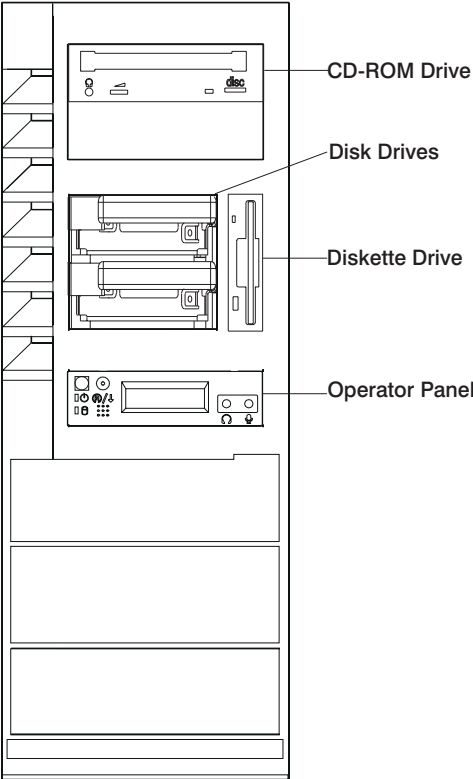
Input/Output Ports

- 25-pin Parallel
- 9-pin Serial (2)
- 8-pin Tablet
- Keyboard
- Mouse
- Ultra SCSI
- 10Base5 Ethernet
- 100BaseTX Ethernet
- Audio Line-in
- Audio Line-out
- Microphone
- Headphone

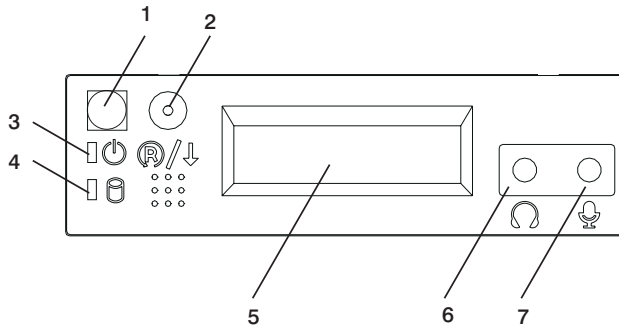
Security Features

- Power-on password
- Privileged-access password

Front View



Operator Panel



1 Power On Switch: Turns computer power on and off.

2 Reset Switch: Function depends upon the operating system.

3 Power-On LED: Glows when computer is on.

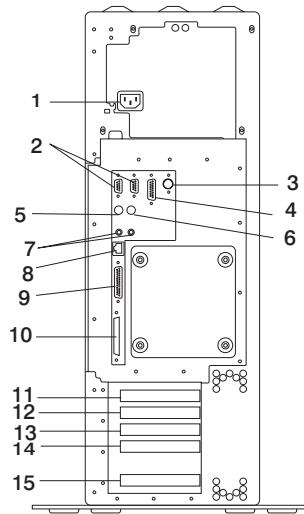
4 Hard Disk Drive Status LED: Glows when computer is reading from or writing to the disk drive.

5 Operator Panel Display: Displays current status of system unit startup, or diagnostic information in the event of a hardware problem.



6 Headset Receptacle: For connecting audio headphones.


7 Microphone Receptacle: For connecting audio microphone.


Rear View




1 Power Connector: For connecting the power cable.

2 9-Pin Serial Ports (1 and 2): For a TTY terminal, modem, or other serial devices.



3 Tablet Port (): For attaching a digitizing tablet to your computer.


4 10Base5 Ethernet Port (): For attaching your computer to an Ethernet thick connection (or Ethernet thin connection, using an optional transceiver) through a 10base5 connector.


5 Keyboard Port (): For keyboard connection.

6 Mouse Port (): For mouse connection.

7 Audio Ports:

 Audio line out
 Audio line in

8 10BaseT Ethernet Port (): For attaching your computer to an Ethernet/Twisted pair connection through a 10baseT connector.

9 Parallel Port (): For connecting a parallel printer or other parallel devices.

10 External SCSI Port (): For connecting external SCSI devices.

11-15 Expansion Slots: For adding PCI adapters.

11 Expansion Slot 5

12 Expansion Slot 4

13 Expansion Slot 3

14 Expansion Slot 2

15 Expansion Slot 1

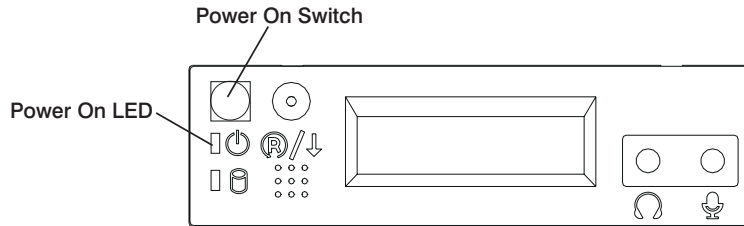
Chapter 2. Using the System Unit

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. 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.

3. If the Power On light does not come on and there is no indication of power when you press the Power On switch, ensure that the power cord, located at the back of the system unit, is plugged into a grounded electrical outlet. If this does not solve the problem, go to Chapter 8, “Hardware Problem Determination” on page 8-1. If the LED is not flashing and 0K is not displayed in the display, go to the Chapter 5, “Using the Stand-alone and Online Diagnostics” on page 5-1.

Stopping the System Unit

Attention: When using the shutdown procedure for your system, follow the correct shutdown procedure before you stop the system unit. Failure to do so may result in the loss of data.

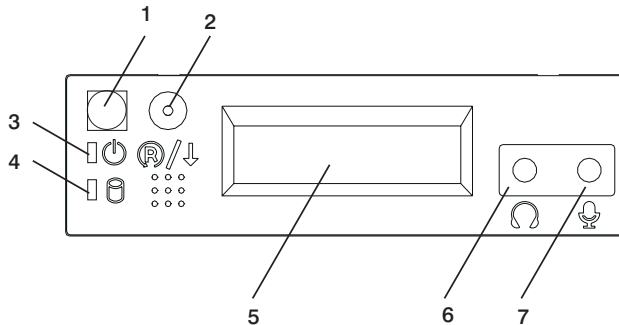
1. At a command line, enter `shutdown -F` to stop the operating system.
2. After you shut down the operating system, set the power switches of any attached devices to Off.
3. The system unit is powered down by the shut down procedure.
4. If you will be servicing the system unit, unplug the system unit 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



1 Power On Switch: Turns system unit power on and off.

2 Reset Switch: Function depends upon the operating system.

3 Power-On LED: Glows when computer is on.

4 Hard Disk Drive Status LED: Glows when computer is reading from or writing to the disk drive.

5 Operator Panel Display: Displays current status of system unit startup, or diagnostic information in the event of a hardware problem.

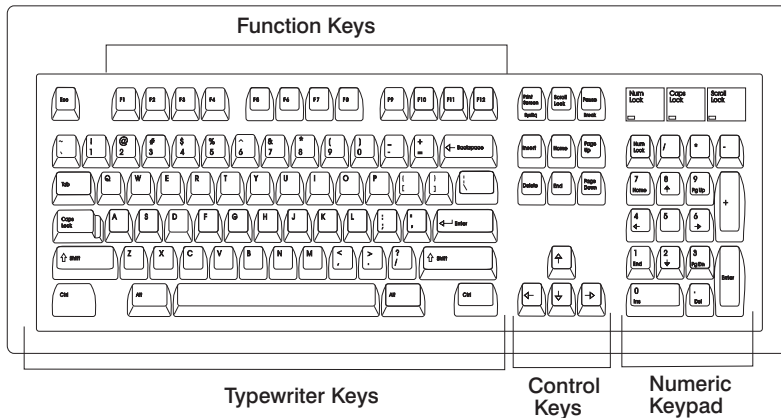
6 Headset Receptacle: For connecting audio headphones.

7 Microphone Receptacle: For connecting audio microphone.

Using the Keyboards

There are several keyboards 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 depend on the software used. The character sets for the keyboards are contained and explained in the information for your operating system.

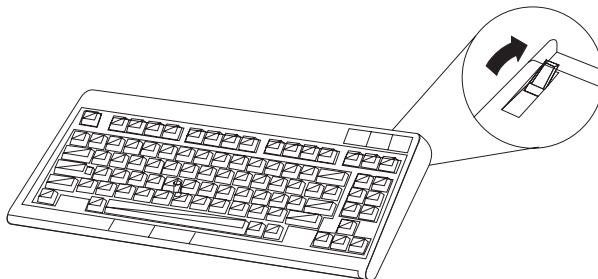


The keyboard is divided into four sections:

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

On all of the keyboards, you can adjust the tilt position for typing comfort. To tilt the keyboard, pull out on 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.

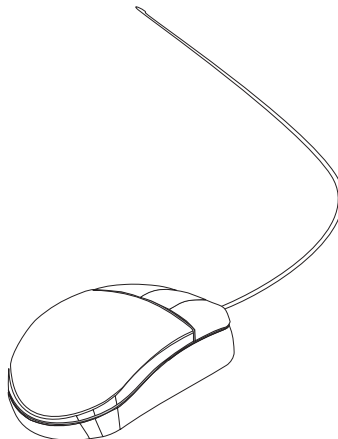
The keyboard cable plugs into the keyboard connector at the rear of the system unit.



Using the Three-Button Mouse

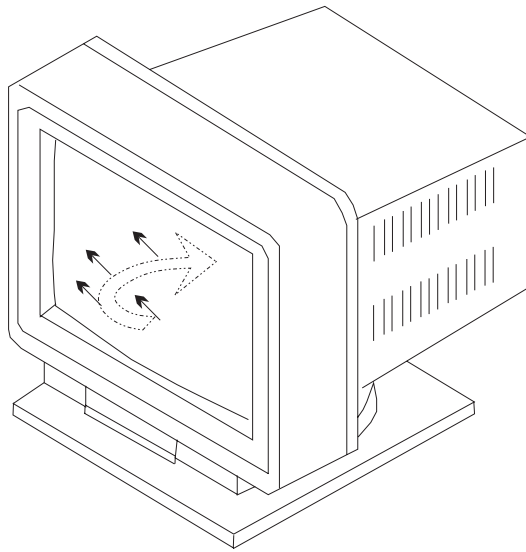
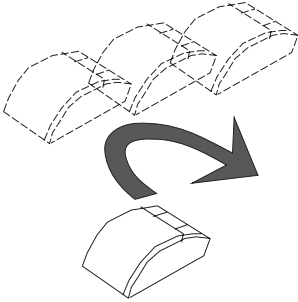
The mouse is a hand-operated locating device. A three-button mouse is available for use with the system unit.

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 as shown in this illustration, 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 system unit.

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.

Care of the Mouse

The operating surface for the mouse should be smooth, clean, and flat. For example, you can operate the mouse on the following surfaces:

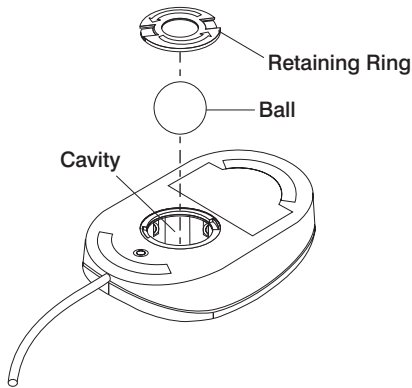
- Finished wood
- Glass
- Enamel
- Plastic
- Paper (except newspaper)
- Metal

Rough surfaces collect contaminants that can be transferred to the interior of the mouse by the ball. The surface you use should be free from spills, dirt, dust, lint, wax, eraser dust, and other foreign matter. 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.

- 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

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



2. Remove the ball.
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 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

Diskette Compatibility

The system unit 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 diskette drives:

- 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

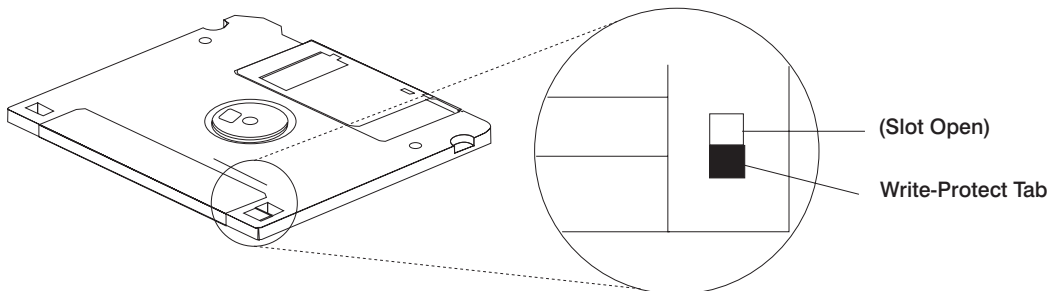
Write-protecting diskettes is necessary so that important information is not accidentally lost.

When diskettes are write-protected, you can read information from the diskettes, but you cannot write information on to them.

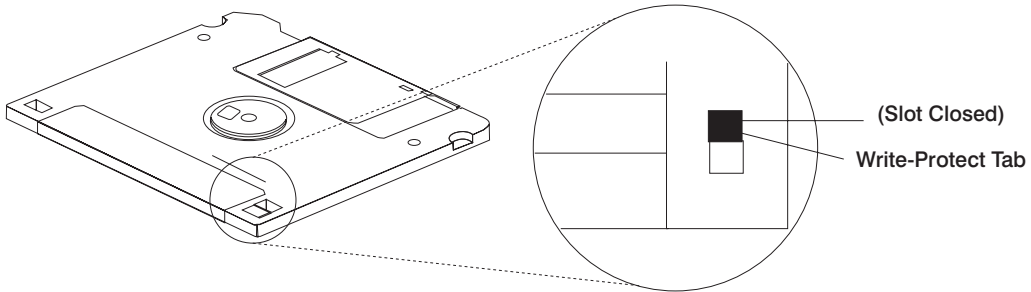
There is a write-protect tab on the 3.5-inch diskette.

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.



- To allow writing onto a diskette, slide the write-protect tab to cover the protect slot.



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. Pull the diskette out.

Using the CD-ROM Drive

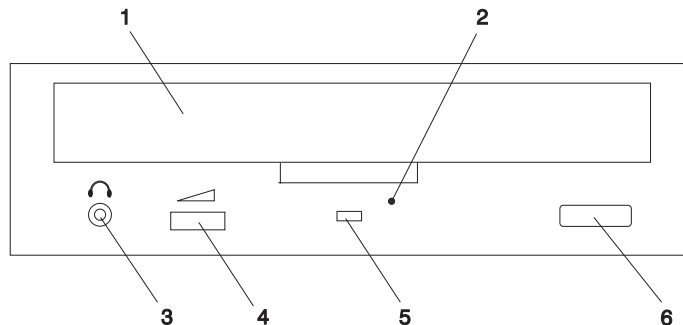
CAUTION:

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

This section describes the features of the 32X 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 2100KB per second (14X) at inner diameter and 4800KB per second (32X) at outer diameter due to constant RPM spin rate
- High-speed synchronous burst rate of 10MB per second
- Average random access time of 90ms
- Loading tray accommodates both 8cm discs (in the horizontal orientation only) and 12cm 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
- Contains headphone output and line output for audio

Front View of CD-ROM Drive



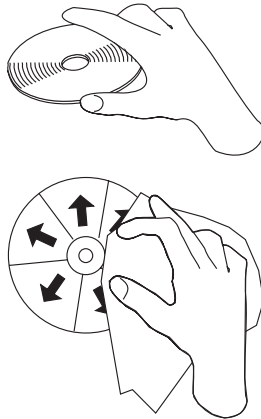
- 1 Compact Disc Tray
- 2 Emergency Eject Hole
- 3 Headphone Jack
- 4 Volume Control
- 5 Status Light
- 6 Load/Unload Button

Understanding the Status Lights

The status lights indicate information about the operational status of the drive. The various conditions are explained below.

If light is:	Condition is:
Off	Drive is in standby mode with or without a disc loaded.
Blinking (green)	Any of the following: <ul style="list-style-type: none">• 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 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.

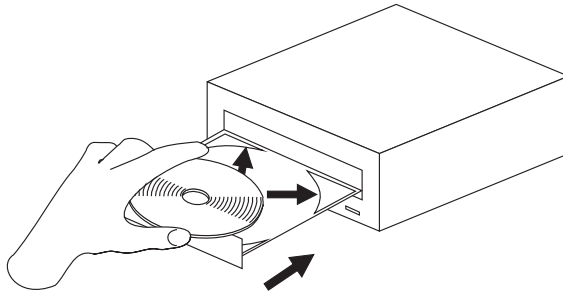
Other Handling Considerations

Be sure to take the following additional precautions when you use the 32X SCSI-2 CD-ROM Drive drive:

1. Remove compact discs from the tray before you move the drive anywhere.
2. 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
3. Do not insert foreign objects into the drive.
 4. 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:

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 tray should automatically open 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 the power off to your system unit.
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 2-11 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 either have headphones connected to the headphone jack located on the front of the drive or an audio card connected to the line out connector located on the back of the drive. You must also have an audio software application installed.

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

General Information for the 8mm Tape Drive

The 8mm Tape Drive is an internal streaming tape drive that provides medium to high capacity backup and archival capability and a high data transfer rate. The 8mm Tape Drive utilizes WIDE bus architecture. Communications on the SCSI bus can be either asynchronous or synchronous. The 8mm Tape Drive is read only compatible with existing 2.3GB, 5.0GB, and 7.0GB 8mm tape drives. The 8mm Tape Drive is a boot device.

The tape drive is used primarily for:

- Saving and restoring system data files
- Archiving important records
- Distributing operating system software upgrades

The drive conforms to the American National Standards Institute (ANSI) SCSI-2 standard. You can attach the drive to any system that uses a single-ended interface that meets SCSI-2 Standard ANSI X3.131-1994.

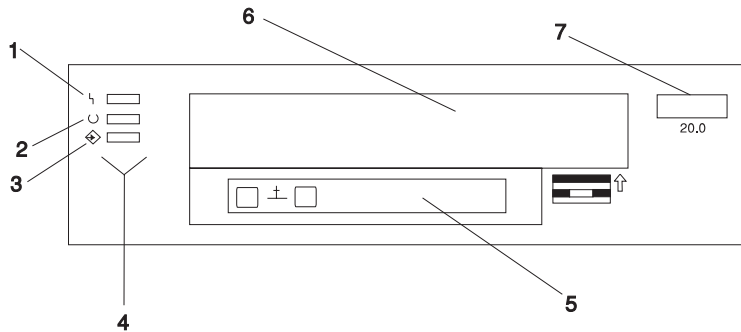
The 8mm Tape Drive's features include:

- Use of 8mm data cartridges.
- Compression capability, effectively doubling the native capacity and data rate. The actual capacity per cartridge varies depending on the application and the type of data cartridge being used.

Note: The factory default setting is *Activated*. Data compression is usually controlled by the application software.

- A half-high 5.25-inch form-factor.
- An LCD display that provides operating and error messages.
- Status lights that indicate:
 - When it is time to clean the tape drive
 - When the tape is in motion
 - When the drive is ready to accept tape motion commands

Front View of the 8mm Tape Drive



- 1 Disturbance (amber)
- 2 Ready (green)
- 3 Activity (green)
- 4 Status lights
- 5 LCD display
- 6 Tape drive door
- 7 Unload button

Operating Recommendations

Attention: Be sure to read “Handling Static–Sensitive Devices” on page 4-2 before you remove the 8mm Tape Drive from its anti-static bag or any time you handle it. For optimum performance, always follow the recommendations listed below:

- Handle the drive carefully and by its external metal chassis. Keep your hands away from the printed circuit boards, components, and printed circuit (flex) cables.
- If possible, work on a cushioned surface, and do not drop the tape drive onto the work surface.
- If you move the tape drive to an environment that is colder or warmer than its previous environment, keep the drive in its package and allow the package to reach the current room temperature. This prevents potential data loss or damage to the tape drive. Allow one hour of acclimation for each 10 degrees C (18 degrees F) difference between the ship or storage temperature and the room temperature.
- Use only high-quality data grade 8mm tape cartridges recommended by the manufacturer (see “Obtaining Additional Tape Cartridges” on page 2-26).

- Remove the tape cartridge from the tape drive when it is not in use, and store the cartridge in the cartridge case.
- Do not open the door on the data tape cartridge. This door covers and protects the magnetic tape material from dirt, dust, and damage.
- Avoid touching the tape, as doing so can cause loss of data.
- Back up any tape cartridge that repeatedly produces error messages, then discard the old tape cartridge. Error information is saved in the system error log.
- Clean the tape path regularly according to the cleaning procedure described in “Cleaning the Tape Drive” on page 2-25. Use only recommended cleaning cartridges. Other cleaning cartridges can permanently damage the tape drive.

8mm Tape Cartridge Types

There are different types of 8mm tape cartridges that you can use for the following purposes:

Type	Purpose
Test Tape Cartridge:	Checks the operation of the drive or to run diagnostics. Do not use it to save programs or data. This cartridge, which is specially labeled, is included with the 8mm Tape Drive.
Data Tape Cartridge:	Saves your programs or data. This cartridge is included with the 8mm Tape Drive.
Cleaning Tape Cartridge:	Cleans the 8mm tape drive. See “Cleaning the Tape Drive” on page 2-25. This cartridge is included with the 8mm Tape Drive.

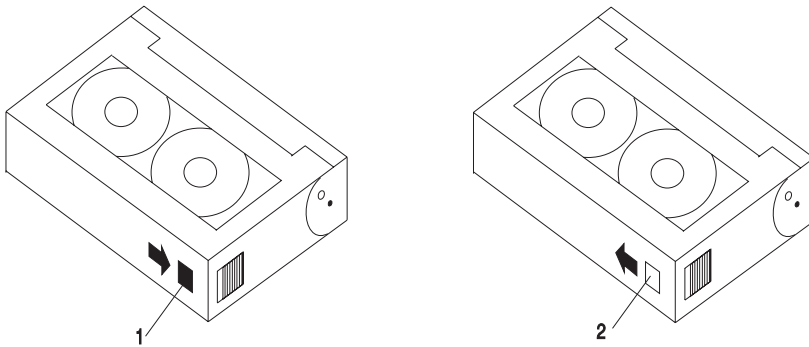
Tape Cartridge Compatibility

The 8mm Tape Drive is compatible with existing 8mm tape subsystems that comply to the American National Standard (ANSI) X3B5/89-136, Rev. 6, Helical-scan Digital Computer Tape Cartridge, 8mm for Information Exchange. Refer to the following table for information about specific tape compatibility.

Format Modes (C=compression mode)								
8mm Tape Drive	2.3GB	2.3GB (C)	5.0GB	5.0GB (C)	7.0GB	7.0GB (C)	20.0GB	20.0GB (C)
2.3GB	Read / Write	-	-	-	-	-	-	-
5.0GB	Read / Write	Read / Write	Read / Write	Read / Write	-	-	-	-
7.0GB	Read / Write	Read / Write	Read / Write	Read / Write	Read / Write	Read / Write	-	-
20.0GB	Read Only	-	Read Only	Read Only	Read Only	Read Only	Read / Write	Read / Write

Setting the Write-Protect Tab on 8mm Tape Cartridges

It is necessary to set the write-protect tab on a tape cartridge so that you do not accidentally lose information. The window on the tape cartridge controls write-protection. When the window on a tape cartridge is closed, write protection is set and information can be read from the tape, but not written to it. When the window on a tape cartridge is open, write protection is not set and information can be read from the tape and written to it.



- 1 Window open: Write-protect tab not set
- 2 Window-closed: Write-protect tab set

Environmental Considerations for 8mm Data Cartridges

This section describes operating and storage conditions including temperature, relative humidity, and maximum wet bulb data.

Attention: The manufacturer specifies a set of temperature and humidity ranges in which the 8mm data cartridge can operate with ease. Only regular cleaning procedures are required when operating the cartridge within this range. The risk of possible data loss is increased if 8mm tape cartridges are operated, stored, or shipped outside the temperature or humidity ranges shown in Table 2-1.

Condition	Operating Ranges	Storage	Shipping
Temperature	60°F-90°F (16°C-32°C)	41°F-90°F (5°C-32°C)	-40°F-126°F (-40°C-52°C)
Relative Humidity (non-condensing)	20%-80%	20%-80%	20%-80%
Maximum Wet Bulb	73°F (23°C)	79°F (26°C)	79°F (26°C)

Always let a cartridge acclimate to the operating environment before you use it. Acclimation is necessary for any data cartridge that has been exposed to a different humidity environment or to a temperature change of 11°C or 20°F or more. Place the cartridge, with its container, in the operating environment for as long as it has been away from the operating environment or for 24 hours, whichever is less.

Operating the 8mm Tape Drive in Harsh Environments

The 8mm Tape Drive is ideally suited to streaming operations rather than tape movement operations involving multiple stops and starts and random searches. You should use streaming movement whenever possible.

Do not use for archiving any tape that was previously used outside the ranges specified in Table 2-1 for an extended period of time. Exposure to the new environment deteriorates the magnetic and physical strength of the tape. Do not store important data on a tape that was used outside the specified ranges. For reliable archiving, transfer the data to a new tape.

Erasing 8mm Data Cartridge

Most bulk eraser devices cannot erase 8mm data cartridges. In order to properly erase an 8mm data cartridge with a bulk eraser device, the erasure rating must be at least 1500 oersted.

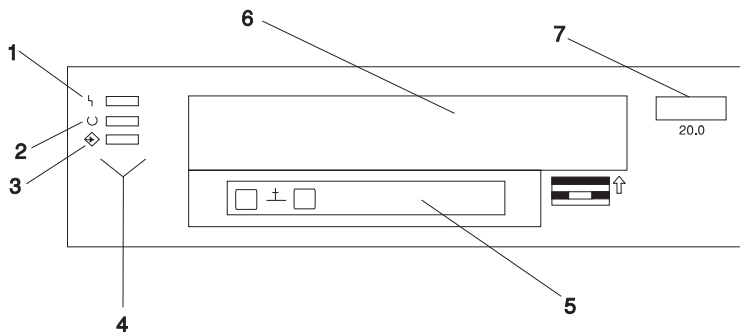
Using the 8mm Tape Drive

This section provides information about operating, using, and maintaining your 8mm Tape Drive.

Status Lights

The 8mm Tape Drive has two green status lights and one amber status light. The on and off combinations of the status lights indicate the current condition of the tape drive.

Each of the International Organization for Standards (IOS) symbols located next to a status light indicates a specific condition of the tape drive as follows:



- 1 Disturbance (amber)
- 2 Ready (green)
- 3 Activity (green)
- 4 Status lights
- 5 LCD display
- 6 Tape drive door
- 7 Unload button

Table 2-2 on page 2-22 explains the meaning of the green and amber status light conditions.

Table 2-2. Status Lights on the 8mm Tape Drive

Status	Disturbance (amber)	Ready (green)	Activity (green)
The power-on self-test (POST) is running or the system has issued a Reset to the drive.	On	On	On
One of the following has occurred: <ul style="list-style-type: none"> • The power is off. • The POST has completed successfully, but no tape cartridge has been inserted. See note 2.	Off/On	Off	Off
A tape cartridge has been inserted, and the 8mm Tape Drive is ready to receive commands from the system. See note 2.	Off/On	On	Off
A tape cartridge has been inserted, and the 8mm Tape Drive is performing a tape load or unload operation. See note 2.	Off/On	Off	Flashing
The tape is in motion, and the 8mm Tape Drive is busy running a device operation. See note 2.	Off/On	On	Flashing
The 8mm Tape Drive has detected an internal fault that requires corrective action. See note 1.	Flashing	Off	Off
The tape path requires cleaning. Refer to "Cleaning the Tape Drive" on page 2-25.	On	Off or On	Off or Flashing

Notes:

1. If a fault or an error condition occurs, press the unload button for approximately 15 seconds to reset the drive. If the disturbance light still flashes after the reset, contact your service representative for assistance.
2. If the disturbance light is on, cleaning is required. See "Cleaning the Tape Drive" on page 2-25.

Liquid Crystal Display

The 8mm Tape Drive features a liquid crystal display (LCD), which is located on the front panel. The LCD displays operating and error messages.

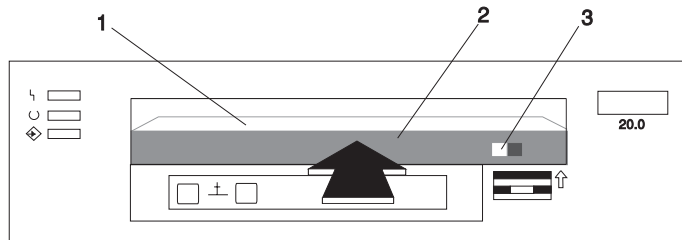
Changing the Display Language

The text on the 8mm Tape Drive LCD is available in several languages. To change the language:

1. Press and hold the unload button after you turn the power on to the 8mm Tape Drive or, if your system unit is already running, press and hold the unload button for approximately 15 seconds until the LCD displays RESET. Release the unload button for approximately one second, then press and hold the unload button again.
2. After the LCD cycles through all the reset messages, it cycles through the available languages. When the desired language displays, release the unload button.

Loading the 8mm Tape Cartridge

Before loading the tape cartridge, make sure the system unit power is on and that the write-protect tab on the tape cartridge is properly set. Refer to “Setting the Write-Protect Tab on 8mm Tape Cartridges” on page 2-19. The tape drive loads the tape from the cartridge and prepares it for reading and writing.



- 1 Window side of tape cartridge
- 2 8mm tape cartridge
- 3 Write-protect tab

To load the 8mm tape cartridge:

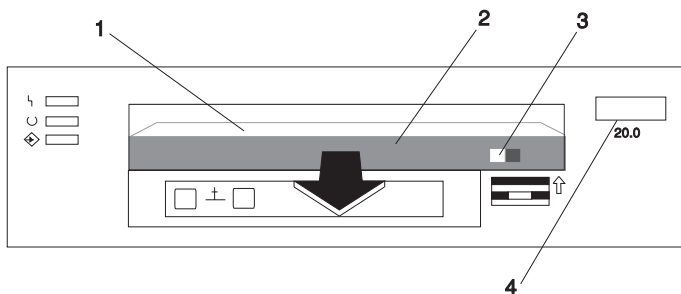
1. Grasp the edges of the 8mm tape cartridge with the write-protect tab toward you and the window side of the cartridge facing up.
2. Slide the tape cartridge into the opening on the front of the 8mm tape drive until the loading mechanism pulls the cartridge into the drive and the drive door closes. The ready status light (green) comes on if the load operation was successful.

The SP is ready for data operations when the tape cartridge is inserted. After the cartridge is inserted into the tape drive, the tape takes about 25 seconds to load.

Commands can be entered while the tape is loading. Any commands to the tape drive start running once the tape has finished loading. Commands not requiring the tape cartridge are run immediately.

Unloading the 8mm Tape Cartridge

Before you perform the unload operation, make sure the power to the system unit is on.



- 1 Window side of tape cartridge
- 2 8mm tape cartridge
- 3 Write-protect tab
- 4 Unload button

To unload and eject the tape cartridge, press the unload button. The SP rewinds the tape, then ejects the tape cartridge from the tape drive. After you press the unload button, the following actions occur:

- The ready status light goes off.
- The read/write status light flashes during the unload operation.
- The read/write status light goes off when the cartridge is ejected from the tape drive.

The time required for a tape to rewind and unload is between 18 seconds and 3 minutes, depending on the position of the tape when you push the unload button.

If a fault or an error condition occurs and you cannot eject the tape, press the unload button for approximately 15 seconds to reset the drive. If the tape cartridge cannot unload and has to be removed manually from the drive, contact your service representative.

Cleaning the Tape Drive

Attention: Do not use video cleaning cartridges in the 8mm Tape Drive. Video cleaning cartridges can damage the 7043 drive.

Clean the tape drive:

- After you use a metal particle (MP) tape and before you use an advanced metal evaporative (AME) tape
- When error rates exceed an acceptable level as indicated by the LED and message
- Every 72 hours of tape motion as indicated by the LED and message

The 8mm Tape Drive counts the number of hours of tape motion. When it is time to clean the tape path, it displays the message * * CLEAN SOON and turns on the top status light.

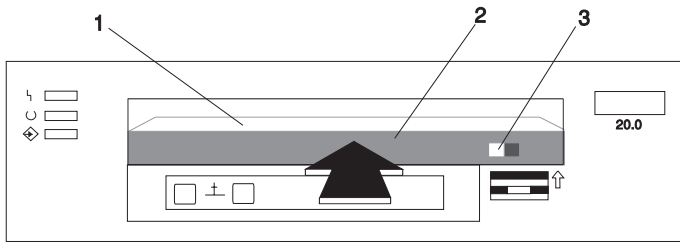
You must clean the tape after using metal particle (MP) media and before using advanced metal evaporative (AME) tapes. If you use MP media, the LCD prompts you to clean the tape path by displaying the message MUST CLEAN.

More frequent cleaning may be required if you operate the drive in a dusty environment or in humid conditions. If you allow dust to accumulate, the drive has to perform more reads and writes. This can damage the drive or cause data loss, which can be prevented by regular cleaning.

The cleaning cartridge cleans the 8mm Tape Drive 18 times before you must discard it. If you attempt to use an 8mm cleaning cartridge more than 18 times, the tape drive automatically detects the error, ejects the cleaning cartridge with the amber disturbance status light remaining on, and displays the message DEPLETED.

Do not use video cleaning cartridges in your 8mm Tape Drive. The 8mm Tape Drive may be permanently damaged after using a video cleaning cartridge even a few times.

Before loading the cleaning cartridge, make sure the power to the tape drive is on.



- 1 Window side of tape cartridge
- 2 8mm cleaning cartridge
- 3 Write-protect tab

To clean the tape path:

1. Grasp the edges of the 8mm cleaning cartridge with the window side of the cartridge facing up and slide it into the opening on the front of the 8mm Tape Drive until the loading mechanism pulls it into the drive.

After you fully insert the 8mm cleaning cartridge into the 8mm Tape Drive, the following cleaning operations are automatically performed:

- The cleaning tape loads into the tape path. The message `CLEANING...` displays. The cleaning cycles take approximately two minutes.
- The tape unloads and the cleaning cartridge ejects from the tape drive upon completion of the cleaning operation.
- The amber disturbance status light goes off if the cleaning operation was successful.

2. Record the use of the cleaning cartridge on the cartridge.

Obtaining Additional Tape Cartridges

Use only tape cartridges recommended by the manufacturer in the 8mm Tape Drive. Contact your customer service representative or the place of purchase to obtain the recommended tape cartridges.

General information for the 12/24GB 4mm Tape Drive

The 12/24GB 4mm Tape Drive is an internal streaming tape drive that provides medium to high capacity backup and archival capability and a high data transfer rate. The 12/24GB 4mm Tape Drive utilizes NARROW bus (8-bit) architecture. Communications on the SCSI bus can be either asynchronous or synchronous. The 12/24GB 4mm Tape Drive is compatible with existing 2.0GB and 4.0GB 4mm tape drives. The 12/24GB 4mm Tape Drive can be used as a boot device.

The tape drive is used primarily for:

- Saving and restoring system data files
- Archiving important records
- Distributing operating system software upgrades.

The drive conforms to the American National Standards Institute (ANSI) SCSI-2 standard. You can attach the drive to any system that uses a single-ended interface that meets SCSI-2 Standard ANSI X3.131-1994.Rev 10h.

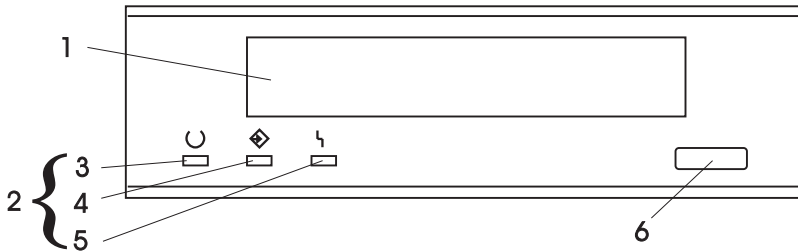
The 12/24GB 4mm Tape Drive's features include:

- Use of 12/24GB 4mm data cartridges.
- Data rate of 1.1MB/second.
- Capacity of 12GB.
- Compression capability, effectively doubles the native capacity of 12GB and the effective data rate. The actual capacity per cartridge varies depending on the application and the type of data cartridge being used. The default is compressed. Use SMIT to change the default.

Note: The factory default setting is *Activated*. Data compression is usually controlled by the application software.

- A half-high 5.25-inch form-factor.
- Status lights that indicate:
 - When it is time to clean the tape drive
 - When the tape is in motion
 - When the drive is ready to accept tape motion commands.

Front View of the 12/24GB 4mm Tape Drive



- 1 Tape Drive Door
- 2 Status lights
- 3 Ready (green)
- 4 Tape Motion (green)
- 5 Disturbance (amber)
- 6 Unload/Reset button

Using the 12/24GB 4mm Tape Drive

This chapter provides information about operating, using and maintaining your 12/24GB 4mm Tape Drive.

Operating Recommendations

Attention: For optimum performance, always follow the recommendations listed below:

- Use only high-quality data grade 12/24GB 4mm tape cartridges recommended by the manufacturer (see “Obtaining Additional Tape Cartridges” on page 2-38).
 - Tape cartridges that do not carry the proper DDS symbol cannot be written to, and their use causes the 12/24GB 4mm Tape Drive to report an error.
- Remove the tape cartridge from the tape drive when it is not in use, and store the cartridge in the cartridge case.
- Do not open the door on the data tape cartridge. This door covers and protects the magnetic tape material from dirt, dust, and damage.
- Avoid touching the tape, as doing so can cause loss of data.
- Back up any tape cartridge that repeatedly produces error messages, then discard the old tape cartridge. Error information is saved in the system error log.

- Clean the tape path regularly according to the cleaning procedure described in “Cleaning the Tape Path on the 12/24GB 4mm Tape Drive” on page 2-36. Use only recommended cleaning cartridges. Other cleaning cartridges can permanently damage the tape drive.

12/24GB 4mm Tape Cartridge Types

There are different types of 12/24GB 4mm tape cartridges that you can use for the following purposes:

Type	Purpose
Test Tape Cartridge:	Checks the operation of the drive or to run diagnostics. Do not use it to save programs or data. This cartridge, which is specially labeled, is included with the 12/24GB 4mm Tape Drive.
Data Tape Cartridge:	Saves your programs or data. This cartridge is included with the 12/24GB 4mm Tape Drive.
Cleaning Tape Cartridge:	Cleans the 12/24GB 4mm Tape Drive. See “Cleaning the Tape Path on the 12/24GB 4mm Tape Drive” on page 2-36. This cartridge is included with the 12/24GB 4mm Tape Drive.

Tape Cartridge Compatibility

The tape drive is compatible with existing 12/24GB 4mm tape subsystems that are designed to operate with Digital Data Storage approved media (DDS-1, DDS-2, DDS-3), which meet the following European Computer Manufacturers Association (ECMA) standards:

- ECMA–139 “3.81 Wide Magnetic Tape Cartridge for Information Interchange” – Helical Scan Recording – DDS Format.
- ECMA–139 “3.81 Wide Magnetic Tape Cartridge for Information Interchange” – Helical Scan Recording – DDS–2 Format.
- ECMA–139 “3.81 Wide Magnetic Tape Cartridge for Information Interchange” – Helical Scan Recording – DDS–3 Format.

4mm Tape Write Density Setting

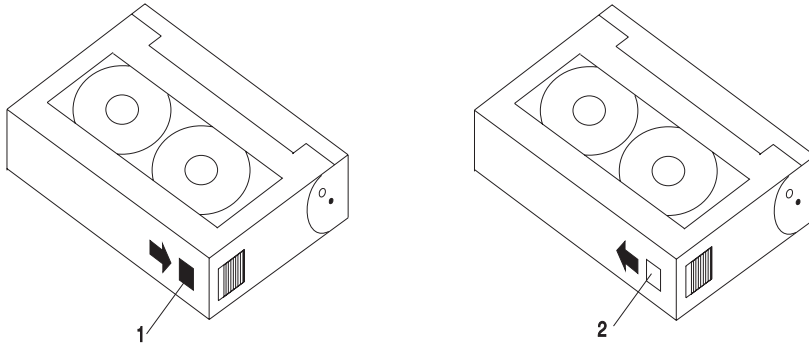
When reading a tape, the drive automatically determines which format is written on the tape.

When writing to a tape, it is necessary to change the density setting of the tape drive in SMIT to correspond to the type of media installed. Refer to the following table for information about the specific density setting:

Density Settings for 4mm Media		
Media Type	Device Compatability	SMIT Density Setting
DDS1	Read Only	N/A
DDS	Read / Write (2.0GB Mode Only)	19
DDS2	Read / Write (4.0GB Mode Only)	36
DDS3	Read / Write (12.0GB Mode Only)	37

Setting the Write-Protect Tab on 12/24GB 4mm Tape Cartridges

It is necessary to set the write-protect tab on a tape cartridge so that you do not accidentally lose information. The write-protect tab on the tape cartridge controls write-protection. When the write-protect tab on a tape cartridge is closed, information can be read from the tape and written to it. When the write-protect tab on a tape cartridge is open, information can be read from the tape, but not written to it.



- 1 Write-protect tab closed: Write enabled
- 2 Write-protect tab open: Write disabled

Erasing 12/24GB 4mm Data Cartridge

Most bulk eraser devices cannot erase 12/24GB 4mm data cartridges. In order to properly erase an 12/24GB 4mm data cartridge with a bulk eraser device, the erasure rating must be at least 3900 oersted.

Environmental Considerations for 12/24GB 4mm Data Cartridges

This section describes operating and storage conditions including temperature, relative humidity, and maximum wet bulb data.

Attention: The manufacturer specifies a set of temperature and humidity ranges in which the 12/24GB 4mm data cartridge can operate with ease. Only regular cleaning procedures are required when operating the cartridge within this range. The risk of possible data loss is increased if 12/24GB 4mm tape cartridges are operated, stored, or shipped outside the temperature or humidity ranges shown in Table 2-1 on page 2-20.

Table 2-3. Temperature and Humidity Ranges for 12/24GB 4mm Tape Cartridges

Condition	Operating Ranges	Storage	Shipping
Temperature	60°F-90°F (16°C-32°C)	41°F-90°F (5°C-32°C)	-40°F-126°F (-40°C-52°C)
Relative Humidity (non-condensing)	20%-80%	20%-80%	20%-80%
Maximum Wet Bulb	79°F (26°C)	79°F (26°C)	79°F (26°C)

Always let a cartridge acclimate to the operating environment before you use it. Acclimation is necessary for any data cartridge that has been exposed to a different humidity environment or to a temperature change of 11°C (20°F) or more. Place the cartridge, with its container, in the operating environment for as long as it has been away from the operating environment or for 24 hours, whichever is less.

Operating the 12/24GB 4mm Tape Drive in Harsh Environments

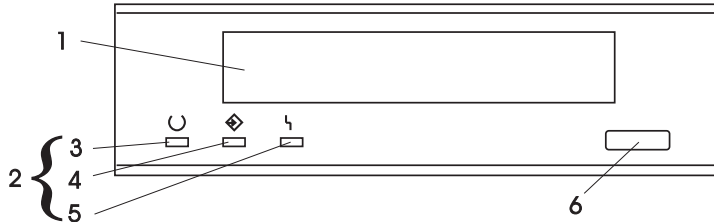
The tape drive is ideally suited to streaming operations rather than tape movement operations involving multiple stops and starts and random searches. You should use streaming movement whenever possible.

Do not use for archiving any tape that was previously used outside the ranges specified in Table 2-3 for an extended period of time. Exposure to the new environment deteriorates the magnetic and physical strength of the tape. Do not store important data on a tape that was used outside the specified ranges. For reliable archiving, transfer the data to a new tape.

Status Lights

The 12/24GB 4mm Tape Drive has two green status lights and one amber status light. The on and off combinations of the status lights indicate the conditions of the 12/24GB 4mm Tape Drive.

Each of the International Organization for Standards (ISO) symbols located above a status light indicates a specific condition of the tape drive as follows:



- 1 Tape Drive Door
- 2 Status lights
- 3 Ready (green)
- 4 Tape Motion (green)
- 5 Disturbance (amber)
- 6 Unload/Reset button

Status Light States

The following tables explain the meaning of the green and amber status lights.

	Ready (green)	Tape Motion (green)	Disturbance (amber)
Off	No cartridge installed or error condition	No cartridge or no activity	No error condition
Steady	Cartridge installed or loading/unloading		Cleaning required or worn media
Flashing	Power-on self- test in progress	Cartridge activity	Error condition

Status Lights on the 12/24GB 4mm Tape Drive			
Status	Ready (green)	Tape Motion (green)	Disturbance (amber)
LED test.	On 2 seconds at power on	On 2 seconds at power on	On 2 seconds at power on
The power-on self-test (POST) is running or the diagnostic cartridge is running.	Flashing	Off	Off
One of the following has occurred: <ul style="list-style-type: none"> The power is off. The POST has completed successfully, but no tape cartridge has been loaded. (See note 2 below.)	Off	Off	Off/On
A tape cartridge has been inserted and the 12/24GB 4mm Tape Drive is ready to receive commands from the system. (See note 2 below.)	On	Off	Off/On
The tape is in motion and the 12/24GB 4mm Tape Drive is running a device operation or cleaning. (See note 2 below.)	On	Flashing	Off/On
The 12/24GB 4mm Tape Drive has detected an internal error that requires corrective action such as tape cartridge failure, high humidity. (See note 1 below.)	Off	Off	Flashing
The tape path requires cleaning, or a poor quality tape cartridge is being used. See "Cleaning the Tape Path on the 12/24GB 4mm Tape Drive" on page 2-36.	Off or On	Off or Flashing	On

Notes:

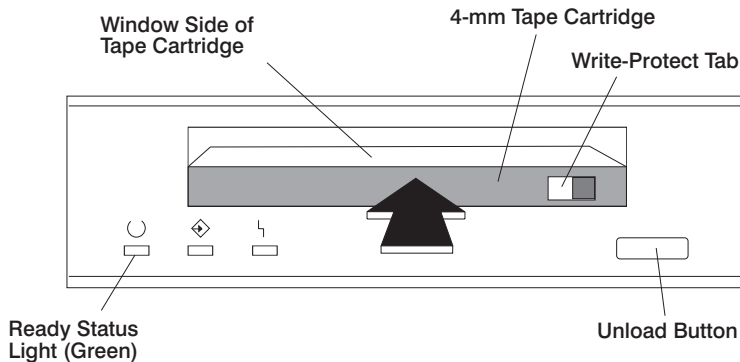
1. If a fault or an error condition occurs, press the unload button for approximately 15 seconds to reset the drive. If the disturbance light still flashes after the reset, contact your service representative for assistance.
2. If the disturbance light is on, cleaning is required. See "Cleaning the Tape Path on the 12/24GB 4mm Tape Drive" on page 2-36.

Loading the 12/24GB 4mm Tape Cartridge

Before loading the tape cartridge, make sure the power is on and the write-protect tab on the tape cartridge is properly set. Refer to “Setting the Write-Protect Tab on 12/24GB 4mm Tape Cartridges” on page 2-31. The tape drive loads the tape from the cartridge and prepares it for reading and writing.

To load the 12/24GB 4mm tape cartridge, do the following:

1. Grasp the edges of the 12/24GB 4mm tape cartridge with the write-protect tab towards you and the window side of the cartridge facing up.
2. Slide the tape cartridge into the opening on the front of the 12/24GB 4mm tape drive until the loading mechanism pulls the cartridge into the drive and the drive door closes. The ready status light (green) goes on if the load operation was successful.



The 12/24GB 4mm Tape Drive is ready for data operations when the tape cartridge is inserted. After the cartridge is inserted into the tape drive, the tape takes about 15 seconds to load.

Unloading the 12/24GB 4mm Tape Cartridge

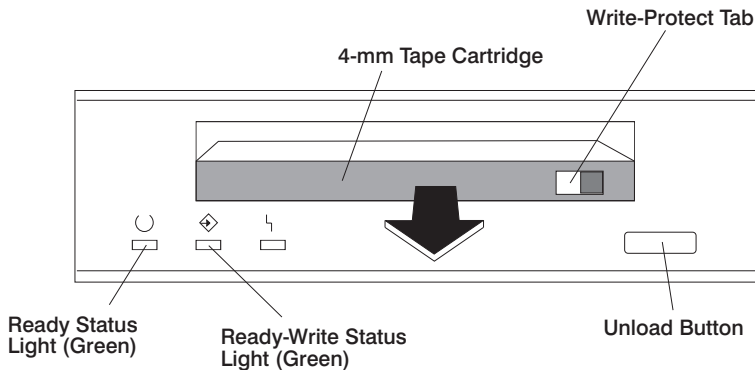
Before performing the unload operation, make sure the power to the system unit is on.

To unload and eject the tape cartridge, press the unload button. The 12/24GB 4mm Tape Drive rewinds the tape and then ejects the tape cartridge from the tape drive.

After you press the unload button, the following occurs:

1. The Ready status light turns off.
2. The Tape Motion status light flashes during the unload operation.

3. The Tape Motion status light turns off when the cartridge is ejected from the tape drive.



The time required for a tape to rewind and unload is between 10 seconds and 1.5 minutes, depending on the position of the tape when the unload button is pushed.

If a fault or an error condition occurs and you cannot eject the tape, press the unload button for approximately 8 seconds to reset the drive.

If the tape cartridge cannot unload and has to be removed manually from the drive, contact your service representative.

Cleaning the Tape Path on the 12/24GB 4mm Tape Drive

The 12/24GB 4mm tape path should be cleaned either approximately every 30 hours of tape motion or once a month, whichever occurs first. The 12/24GB 4mm tape drive monitors the recording quality of the tape cartridge and indicates that the tape path requires cleaning when the disturbance status light (amber) is on.

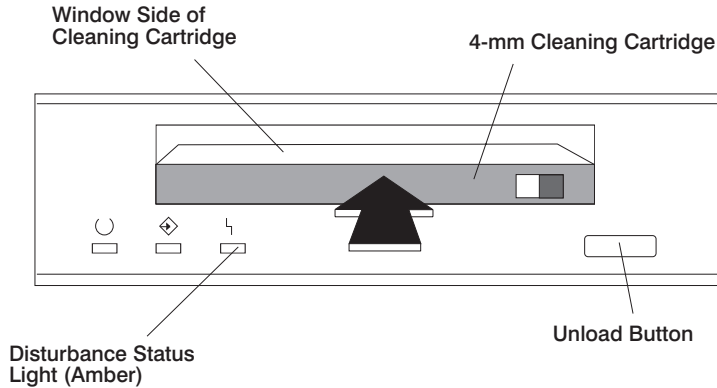
More frequent cleaning may be required if the drive is operated in a dusty environment or in humid conditions. If the dust is allowed to accumulate, the drive has to perform more reads and writes. This can cause data loss, and may be prevented by regularly scheduled cleaning of the drive. The amber Disturbance status light also comes on automatically after 30 hours of tape motion without cleaning.

If you attempt to use a 12/24GB 4mm cleaning cartridge beyond 20 cleanings, the tape drive automatically detects an error and ejects the cleaning cartridge with the disturbance status light (amber) remaining on.

Before loading the cleaning cartridge, make sure the power to the system unit is on.

To load the 12/24GB 4mm cleaning cartridge, do the following:

1. Grasp the edges of the 12/24GB 4mm cleaning cartridge with the window side of the cartridge facing up.
2. Slide the cleaning cartridge into the opening on the front of the 12/24GB 4mm tape drive until the loading mechanism pulls the cartridge into the drive.



After the 12/24GB 4mm cleaning cartridge has been fully inserted into the 12/24GB 4mm Tape Drive, the following cleaning operations are performed automatically:

1. The cleaning tape is loaded into the tape path.
The cleaning cycle lasts approximately 30 seconds.
2. The tape is unloaded and the cleaning cartridge is ejected from the tape drive when the cleaning operation is complete.
3. A successful cleaning operation is indicated when the disturbance status light (amber) goes off (if it was activated before the cleaning operation).

Obtaining Additional Tape Cartridges

The following table lists the tape cartridges that you can order for the 12/24GB 4mm Tape Drive. Contact your customer service representative or the place of purchase to obtain the recommended tape cartridges.

Tape Cartridges for the 12/24GB 4mm Tape Drive		
Part Number	Type of Cartridge	Length
59H3465	12/24GB 4mm Data Cartridge	160 m (525 ft)
59H3466	12/24GB 4mm Test Cartridge	11.5 m (37.7 ft)
59H3090	12/24GB 4mm Cleaning Cartridge	N/A

Using the Service Processor and Service Director Features

The Service Processor and Service Director features protect 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 two features provide a flexible solution to automated system maintenance.

Service Processor

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 at all times. Any system failure which prevents the system from coming back 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 pre-determined 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. 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 pre-determined retry threshold is reached. In the event the Service Processor is unsuccessful in bringing the system on-line (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 and report those failures to the Service Director application.

Unlike the Service Director, 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.

Prior to installing the Service Processor feature, you need to ensure that you have latest levels of Service Processor microcode and system firmware. You also need a properly configured modem. For more information on configuring a modem, see "Modem Configuration Menu" on page C-19.

Service Director

The Service Director is a software extension to the AIX Operating System that monitors the system while the AIX Operating System is running. The Service Director monitors and analyzes all recoverable system failures, and, if needed, can automatically place a service call to a service center (without user intervention).

The service center receives the machine type/serial number, host name, SRN, and a problem description. The service center analyzes the problem report and, if warranted, dispatches a service person to the customer site. The service center also determines if any hardware components need to be ordered prior to the service person's arrival.

The Service Director code also gives the user the option to establish a single system as the problem reporting server. A single system, accessible over the user network, can be used as the central server for all the other systems on the Local Area Network (LAN) who are running the Service Director application. If the Service Director application on a remote client decides a service request needs to be placed, the client forwards the information to the Service Director server who dials the service center telephone number from its locally attached modem. In this scenario, the user only needs to maintain a single analog line for providing call-out capabilities for a large set of servers.

When utilized in an Scalable Parallel (SP) environment, a client/server type implementation is configured. The Service Director client code runs on each of the Scalable Parallel (SP) nodes. The server component runs on the Control Workstation. In the event of any system failures, the relevant information is

transmitted to the Control Workstation through the integrated Ethernet. Once alerted to the system failure, the Control Workstation initiates actions to prepare and send the service request.

A modem is required for enabling automated problem reporting to the service center. Configuration files for several types of modems are included as part of the Service Director package. Refer to “Modem Configuration Menu” on page C-19 for more information on configuring your modem.

Chapter 3. 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 3-23.

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-hand 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 Open Firmware command line, you must press the **F8** key *after the keyboard icon appears* during startup.

If you have pressed the **F8** key, the Open Firmware command line (an "OK" prompt) appears after the initialization and power-on self test (POST) are complete.

Note: If you have installed a privileged-access password, you are prompted for this password before gaining access to the Open Firmware command line.

The Open Firmware command line can be used to set up adapters that are not configurable with the System Management Services. Your adapter documentation directs you to use this option if it is needed.

To enter the graphical System Management Services instead of the Open Firmware command line, 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.

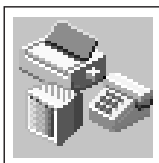
Note: If you have installed a privileged-access password, you are prompted for this password before gaining access to the System Management Services menu.

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



You may also press F8 here to enter the **OK>** prompt.

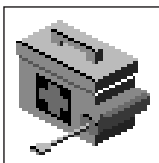
The System Management Services screen contains the following choices.



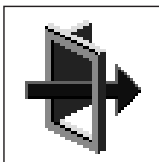
Config: Enables you to view your system setup.



Multi-Boot: Enables you to set and view the default operating system, modify the boot sequence, access the Open Firmware command prompt, and other options.



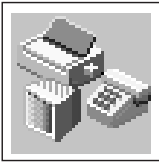
Utilities: Enables you to set and remove passwords, control the playing of system tones, enable the unattended start mode, set and view the addresses of your system's SCSI controllers, select the active console, view or clear the firmware error log, and update your system unit's firmware program.



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, either 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.

<Device Name>

PowerPC, 604

L2-Cache, 0512K

Memory

slot A=8 MB

slot B=8 MB

LPT

addr=3BC

IDE

addr=1F0

COM

addr=3F8

COM

addr=2F8

Audio

Keyboard

Mouse

Diskette

addr=3F0


Integrated Ethernet

addr=9999FF111B

Video

enhanced graphics

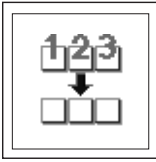
↓



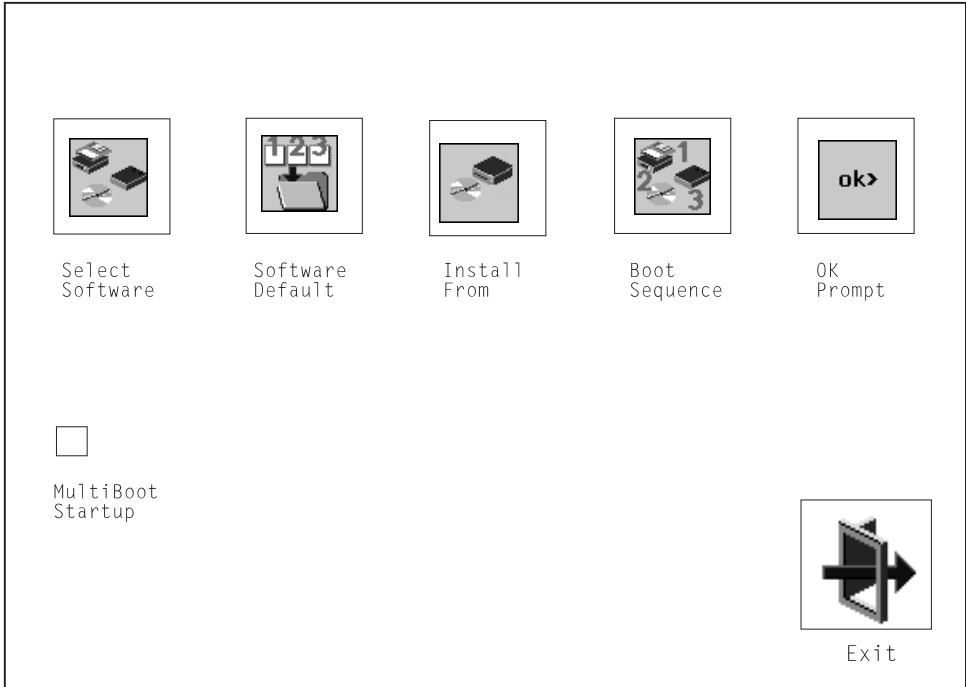
Exit

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.

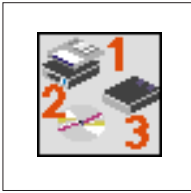
MultiBoot



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

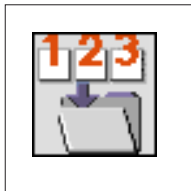


The following describes the choices available on this screen.



Select Software: The Select Software option, if supported by the operating system, allows you to choose which operating system to use. This option is supported by AIX. 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** reference 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.



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:

Note:

1. The primary diskette drive.
2. The CD-ROM drive.
3. Tape drive.
4. Hard disk drive.
5. 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:

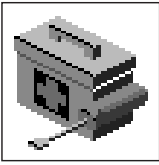
To change the custom boot list back to the default values, click on **Default**. If you change your startup sequence, you must be extremely careful when performing *write* operations (for example, copying, saving, or formatting). You can accidentally overwrite data or programs if you select the wrong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



OK Prompt: Enables you to go directly to the Open Firmware command prompt. The Open Firmware command prompt is used for debugging and device driver development. For more information about the operation of the Open Firmware command prompt, refer to IEEE Standard 1275.

Multiboot Start: Clicking on this button toggles whether the Multiboot menu will appear automatically at startup.

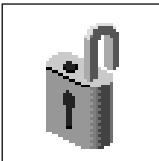
Utilities



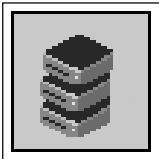
Selecting this icon enables you to perform various tasks and view additional information about your system unit.



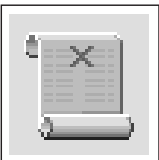
The following describes the choices available on this screen.



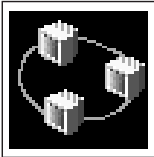
Password: Enables you to set password protection for turning on the system unit and for using system administration tools.



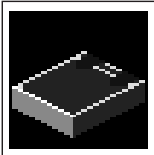
Hard Disk Spin Up Delay: Enables you to change the spin up delay for SCSI hard disk drives attached to your system.



Error Log: Enables you to view and clear the firmware error log information for your system unit.



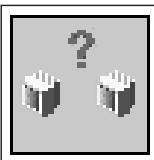
RIPL (Remote Initial Program Load): Enables you to select a remote system from which to load programs via a network adapter when your system unit is first turned on. This option also allows you to configure network adapters which require setup.



SCSI ID: Allows you to view and change the addresses (IDs) of the SCSI controllers attached to your system unit.

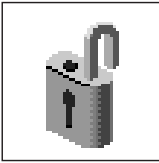


Update: Allows you to update the system firmware program.

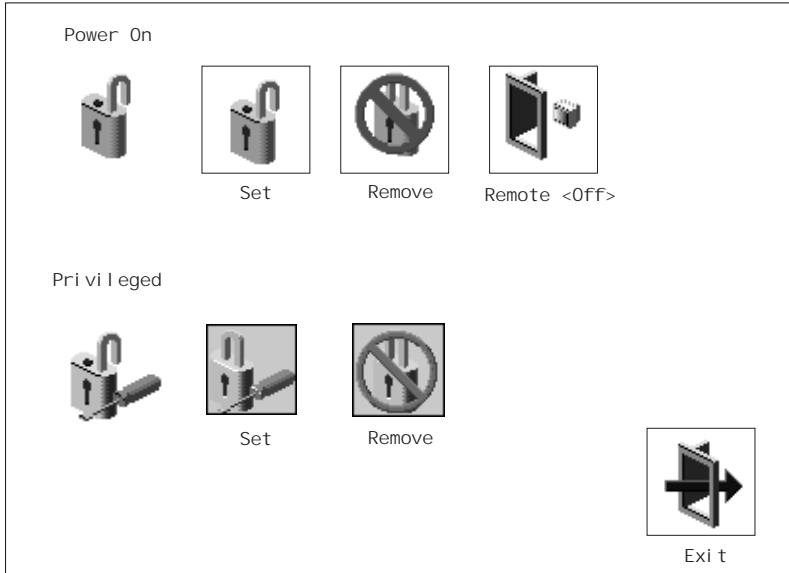


Console: If you have more than one keyboard and display attached to your system unit, or if you have an ASCII terminal attached to your system unit in addition to a keyboard and display, this tool allows you to define which one is active.

Password



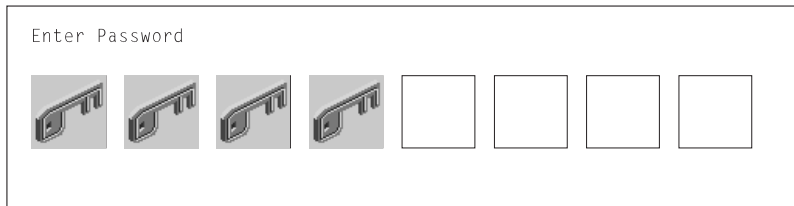
When you select this icon, the following screen is displayed.



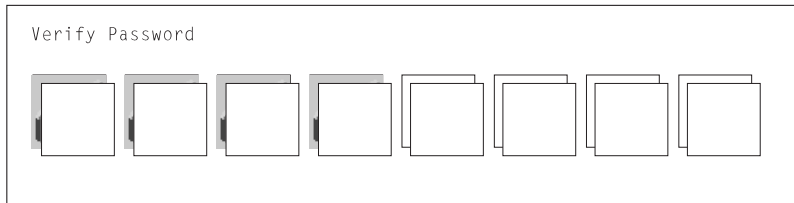
Power-On Password

Setting a power-on 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.



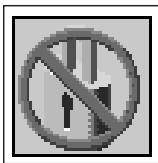
Press **Enter** when you are finished; you must type the password again for verification.



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

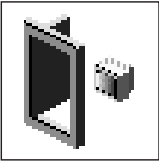
After you have entered and verified the password, the power-on password status icon flashes and changes to the locked position to indicate that the power-on password is installed.

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



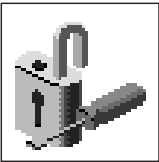
Note: The system unit power cable **must** be disconnected before removing the battery.

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



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. When the remote mode is set, the icon changes to **Remote <On>**.

Note: In order to use the remote mode feature for booting unattended devices, you must enable the unattended start mode. See the “SYSTEM POWER CONTROL MENU” on page C-12 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

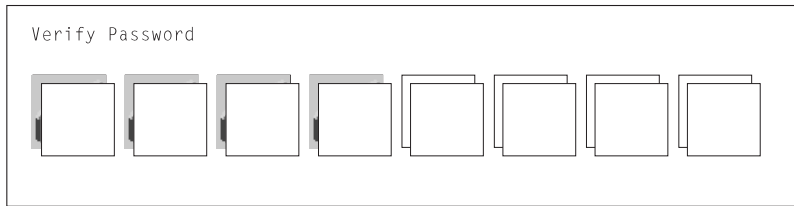
The privileged-access password protects against the unauthorized starting of the system programs. Select the Set icon to set and verify the privileged-access password.

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.

Enter Password

				<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
---	---	---	---	----------------------	----------------------	----------------------	----------------------

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

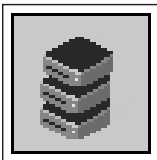


If you make a mistake, press the **Esc** key and start again.

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.


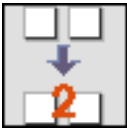

Attention: If no user-defined boot-list exists, and the privileged-access password has been enabled, you are asked for the privileged-access password at startup every time you boot up your system.

Hard Disk Spin Up Delay

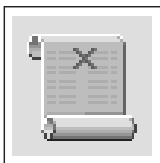


This selection allows you to change the spin up delay for SCSI hard disk drives attached to your system. Spin up delay values can be entered manually or a default setting can be used. All values are measured in seconds. The default is two seconds. After you have entered the new Spin up delay values,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

Harddisk Spin Up Delay
Current Spin Up Value - 112233
Enter New Value - ___111___ (secs)

		
Save	Default	Exit


Error Log




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

System Error Log

1.	96/01/29	00:51:32	12345678	00000000
2.	No entry			



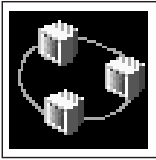
Clear



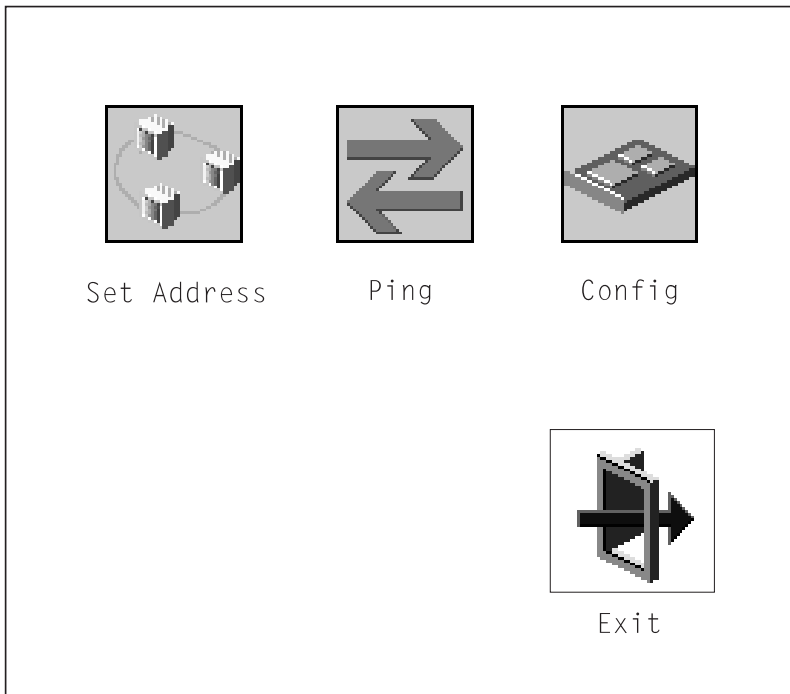
Exit

Selecting the Clear icon erases the entries in this log.

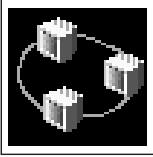
RIPL



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.

Remote IPL Setup

Client Addr	000.000.000.000
Server Addr	000.000.000.000
Gateway Addr	000.000.000.000
Subnet Mask	000.000.000.000



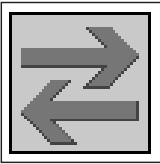
Save



Exit

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

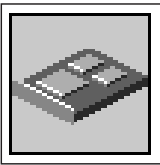
Ping



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

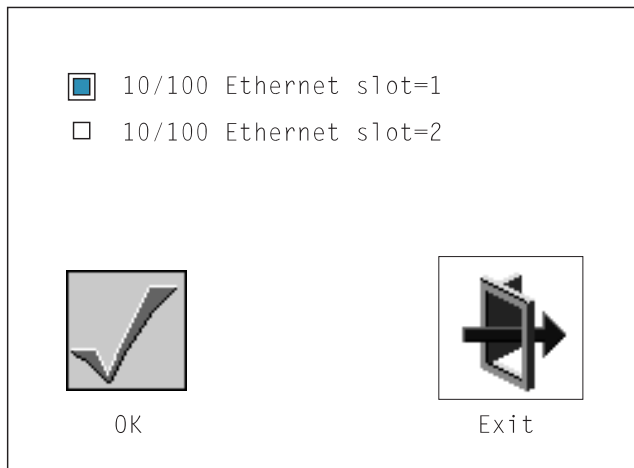
After choosing the Ping option, you are asked to indicate which communications adapter (Token Ring or Ethernet) should be used to send the test transmission.

Config



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

1. Selecting the Config icon causes a list of the adapters requiring configuration to appear.
 - a. Use the arrow keys or mouse to highlight an adapter to configure.
 - b. Press the spacebar to select the adapter.
 - c. Highlight the OK icon and press the Enter key.

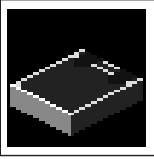


2. The next screen allows you to select the type of adapter you have just chosen (or allow the system to select the type automatically).
 - a. Use the arrow keys or mouse to highlight an adapter to configure.
 - b. Press the spacebar to select the adapter.
 - c. Highlight the OK icon and press the Enter key.

After choosing the adapter to configure, you can select the communications mode of the chosen adapter (or allow the system to select the communications mode automatically).

- a. Use the arrow keys or mouse to highlight an adapter to configure.
- b. Press the spacebar to select the adapter.
- c. Highlight the OK icon and press the Enter key.

SCSI ID






This selection allows you to view and change the addresses (IDs) of the SCSI controllers attached to your system unit. To change a SCSI controllers ID, highlight the entry by moving the arrow keys, then use the space bar to scroll through available IDs. After you have entered the new address, use the arrow keys or mouse to highlight the Save icon and press the Enter key.

At any time in this process, you can select the Default icon to change the SCSI IDs to the default value of 7.

Change SCSI ID

Type	Slot	ID	Max ID
Fast	5	7	7
Fast/Wide	7	7	15

		
Save	Default	Exit

Firmware Update



This selection allows you to update the system or service processor firmware in your system unit from an image on a 3.5 inch diskette.

In order to create a firmware diskette with the latest level of firmware available, see <http://www.rs6000.ibm.com/support/micro>

When prompted, insert the firmware update diskette containing the new firmware image.

ATTENTION: While the new firmware image is being copied into your system unit, you must **not** turn off the system unit. Turning off the system unit during the update process may render your system unit inoperable.

After the firmware update is complete, shut down and restart the system unit.

If the firmware update does not complete successfully or the system unit does not restart after the firmware update, contact your authorized reseller or marketing representative.

Firmware Recovery

If a troubleshooting procedure has indicated that the firmware information in your system unit has been damaged, then you must perform a firmware recovery.

To perform a firmware recovery, do the following:

1. Locate your firmware update diskette.
2. Using another system unit, rename the *.img file on the firmware update diskette to **precover.img**
3. Make sure your system unit is turned off.
4. Insert the firmware recovery diskette into your system unit.
5. Turn on your system unit.
6. When the keyboard indicator appears, press the **1** key if the system console is an ASCII terminal, or the **F1** key if the system console is a directly-attached keyboard.
7. When the System Management Services appear, choose Utilities and perform a Firmware Update as described above.

Text-Based System Management Services

The text-based Open Firmware command line and System Management Services are available if an ASCII terminal is attached to your system unit. The text-based Open Firmware command line allows you to configure some adapters, and the System Management Services makes it possible for you to view information about your system unit and to perform such tasks as setting passwords and changing device configurations.

To enter the Open Firmware command line, you must press the number **8** key *after the keyboard text symbol appears* during startup.

If you have pressed the number **8** key, the Open Firmware command line (an "OK" prompt) appears after the initialization and power-on self tests (POST) are complete.

The Open Firmware command line can be used to set up adapters that are not configurable with the System Management Services. Your adapter documentation directs you to use this option if it is needed.

To start the text-based System Management Services instead of the Open Firmware command line, press the number **1** key on the ASCII terminal keyboard when the keyboard text symbol appears during startup.

After the text-based System Management Services starts, the following screen appears.

Note: The version of firmware currently installed in your system unit is displayed at the top of each screen in the text-based System Management Services. 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.

```
System Management Services

1  Display Configuration
2  Multiboot
3  Utilities
4  Select Language

                                |X=Exit|

====>
```

Selecting the numbered options provide capabilities described on the following pages.

After you have finished using the text-based System Management Services, entering **x** (for exit) boots your system unit.

Display Configuration

This option provides information about the setup of your computer. A screen similar to the following is displayed.

```
<Device Name>
PowerPC, POWER3
L2-Cache, 1M/4M
Memory
  Memory card slot=1, module slot=1 size=32MB
  Memory card slot=1, module slot=2 size=32MB
LPT
  addr=3BC
COM
  addr=3F8
COM
  addr=2F8
Audio
Keyboard
Mouse
Diskette
  addr=3F0
Integrated Ethernet
  addr=80005AF67BD
SCSI cntlr id=7

|P=prev-page| |N=next-page| |x=Exit|
```

MultiBoot Menu

```
Multiboot Menu

1. Select Software
2. Software Default
3. Select Install Device
4. Select Boot Devices
5. OK Prompt
6. Multiboot Startup

                                     |X=Exit|
                                     -----

====>
```

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

In the case of AIX this is a supported option, if you receive a message saying that:
No Operating System Installed

this would mean that information in non-volatile storage could have been lost, as would happen if the battery had been removed. In order to recreate this value, issue the `bootlist` command under AIX with the appropriate parameters as to the location of the operating system in a particular hard disk. Please see the explanation of the `bootlist` command in your AIX documentation.

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, where the operating system is installed from. You select one of the devices 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 on the boot list. Up to 5 devices are supported.

OK Prompt: Provides access to the Open Firmware command prompt.

Multiboot Start Option: Toggles between OFF and ON and selects if the Multiboot menu invokes automatically on startup or not.

Select Boot Devices

This selection enables you to view and change the custom boot list, which is the sequence of devices read at startup time.

```
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

                                     |X=Exit|
                                     -----

====>
```

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

```
Current Boot Sequence

1. Diskette
2. Ethernet (Integrated)
3. SCSI CD-ROM          id=3   (slot=1)
4. SCSI 500MB Hard Disk id=6   (slot=1)
5. SCSI 500MB Hard Disk id=5   (slot=5)

                                     |X=Exit|
                                     -----

===>
```

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

- The primary diskette drive
- CD-ROM drive
- Tape id=5 (slot=1)
- Hard disk drive id=6 (Slot=1)
- Network device.

Selecting any of the **Configure Boot Device** options displays the following screen.

```
Configure Nth Boot Device

Device Number      Current Position      Device Name
-----
      1              1              Diskette
      2              2              Ethernet
      3              3              SCSI CD-ROM
      4              4              SCSI 4.5GB Hard Disk
      5              -

|P=prev-page| |N=next-page| |X=Exit|

===>
```

Utilities

The Utilities screen enables you to select from the following system management tools.

```
Utilities

1. Set Passwords and Unattended Start Mode
2. Spin-Up Delay
3. Display Error Log
4. Remote Initial Program Load Setup
5. Change SCSI id
6. Update System Firmware
7. Update Service Processor Firmware
8. Select Console

                                     |X=Exit|
                                     -----

===>
```

Set Password and Unattended Start Mode

Entering this selection permits access to the following options.

```
Password Utilities

1. Set Power On Password
2. Remove Power On Password
3. Unattended Start Mode <OFF>
4. Set Privileged-Access Password
5. Remove Privileged-Access Password

                                     |X=Exit|
                                     -----

===>
```

Set Power On Password: Setting a power-on password helps protect information stored in your computer. You can use any combination of up to eight characters (A–Z, a–z, and 0–9) for your password. The password you type is not displayed on the screen. Press **Enter** when you are finished; you must type the password again for verification.

If you previously had set a power-on password and wanted to remove it, select **Remove Power-On Password**.

Note: 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.

Set Privileged-Access Password: The privileged-access password protects against the unauthorized starting of the system programs.

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

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

Hard Disk Spin-Up Delay

Selecting this utility allows you to adjust the hard disk spin-up delay in your system unit.

Display Error Log

A screen similar to the following is displayed when you select this option. Here, you can view or clear your system unit's error log.

```

      Error Log
-----
Date      Time      ErrorCode  Location
Entry 1. 01/04/96 12:13:22  25A80011  00-00
Entry 2. no error logged

|C=Clear Error Log|      |X=Exit|
-----
```

Remote Initial Program Load Setup

This option allows you to enable and set up the remote startup capability of your computer. First, you are asked to specify the network parameters.

```
Network Parameters
1. IP Parameters
2. Adapter Parameters
3. Ping

                                     |X=Exit|
                                     -----

====>
```

Selecting the IP 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       [000.000.000.000]

                                     |X=Exit|

===>
```

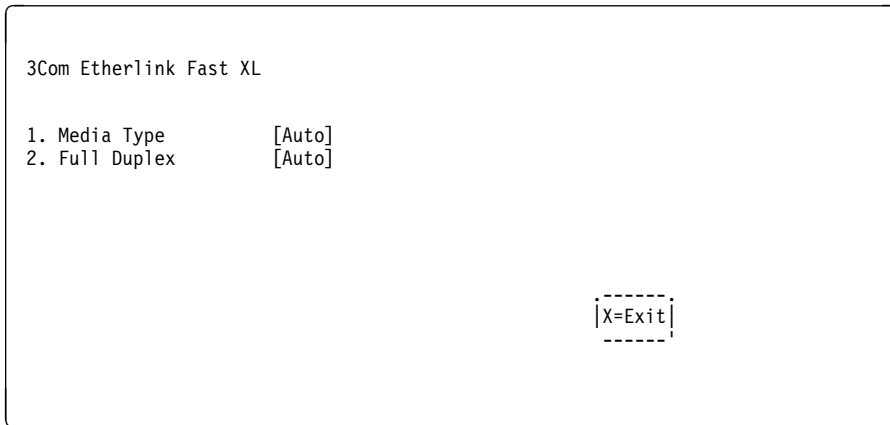
Selecting the Adapter Parameters option allows you to view an adapter's hardware address, as well as configure network adapters that require setup.

```
Adapter Parameters

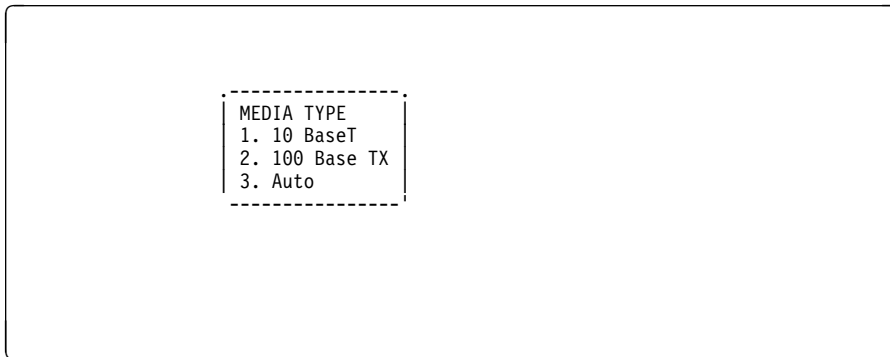
      Device           HW Address
1. 3Com,3C905         80005AFC67BD
2. token-ring         800032E54A12

                                     |X=Exit|
```

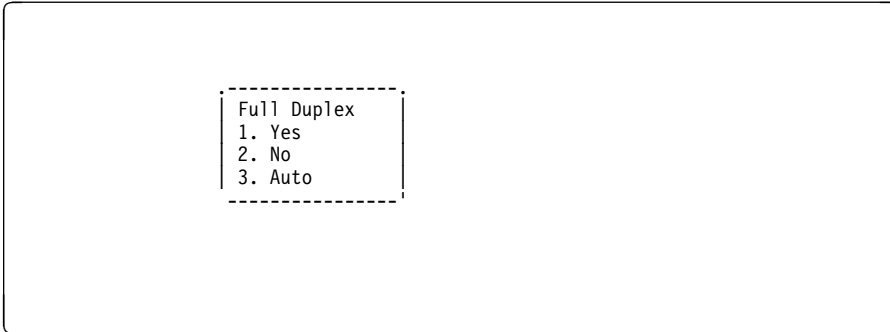
Selecting an adapter on this screen displays configuration menus for that adapter:



Selecting the Media Type option allows you to change the media employed by the Ethernet adapter:



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



Ping, the last option available from the Network Parameters menu, allows you to test a connection to a remote system unit. After selecting the Ping option, you must choose which adapter communicates with the remote system.



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

```
Ping
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]

|E=Execute| |X=Exit|

===>
```

Change SCSI ID

This option allows you to view and change the addresses of the SCSI controllers attached to your computer.

Update System or Service Processor Firmware

These options allow you to update your system or service processor firmware. Note that you must insert a diskette containing the firmware update image after you see the following confirmation screen.

In order to create a firmware diskette with the latest level of firmware available, see <http://www.rs6000.ibm.com/support/micro>

When prompted, insert the firmware update diskette containing the new firmware image.

This selection will update your System Firmware. Do you want to continue? Press Y(Yes) N(No).

Firmware Recovery: If a troubleshooting procedure has indicated that the firmware information in your system unit has been damaged, then you must perform a firmware recovery.

To perform a firmware recovery, do the following:

1. Locate your firmware update diskette.
2. Using another system unit, rename the *.img file on the firmware update diskette to **precover.img**
3. Make sure your system unit is turned off.
4. Insert the firmware recovery diskette into your system unit.
5. Turn on your system unit.
6. When the keyboard indicator appears, press the number **1** key on the system console ASCII terminal.
7. When the System Management Services appear, choose Utilities and perform a System Firmware Update as described above.

Select Console: Selecting this option allows you to define which display is used by the system for system management.

Select Language

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
6. Svenska

====>                                [x=Exit]
```

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

Chapter 4. Installing Options

This chapter provides instructions to help you add options to your system. Some option-removal instructions are provided, in case you need to remove one option to install another. If you have several internal options to install, these instructions enable you to add them all at one time.

Safety Considerations

Observe the following safety precautions any time you work with this system unit.

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 communications lines.

CAUTION:

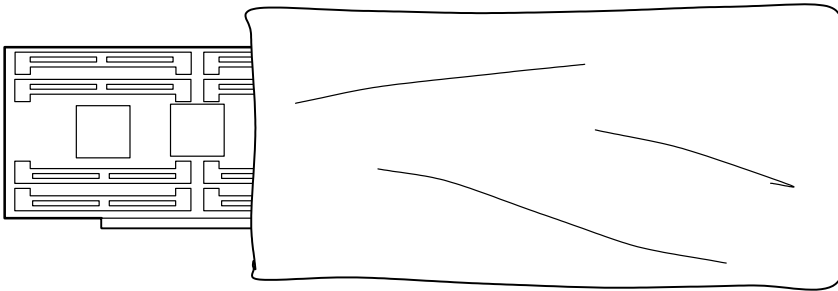
This product is equipped with a 3-wire power cable and plug for the user's safety. Use this power cable in conjunction with a properly grounded electrical outlet to avoid electrical shock.

Handling Static-Sensitive Devices

Attention: Adapters, planars, diskette drives, and disk drives are sensitive to static electricity discharge. These devices are wrapped in antistatic bags, as shown in this illustration, to prevent this damage.

Take the following precautions:

- If you have an antistatic wrist strap available, use it while handling the device.
- Do not remove the device from the antistatic bag until you are ready to install the device in the system unit.
- With the device still in its antistatic bag, touch it to a metal frame of the system.
- Grasp cards and boards by the edges. Hold drives by the frame. Avoid touching the solder joints or pins.
- If you need to lay the device down while it is out of the antistatic bag, lay it on the antistatic bag. Before picking it up again, touch the antistatic bag and the metal frame of the system unit at the same time.
- Handle the devices carefully in order to prevent permanent damage.



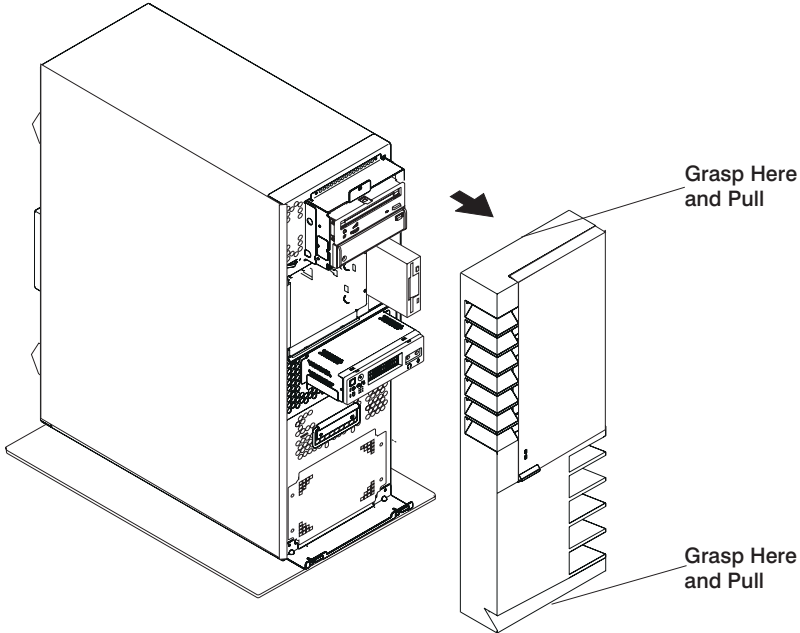
Stopping the System Unit

Attention: When using the shutdown procedure for your system, follow the correct shutdown procedure before you stop the system unit. Failure to do so may result in the loss of data.

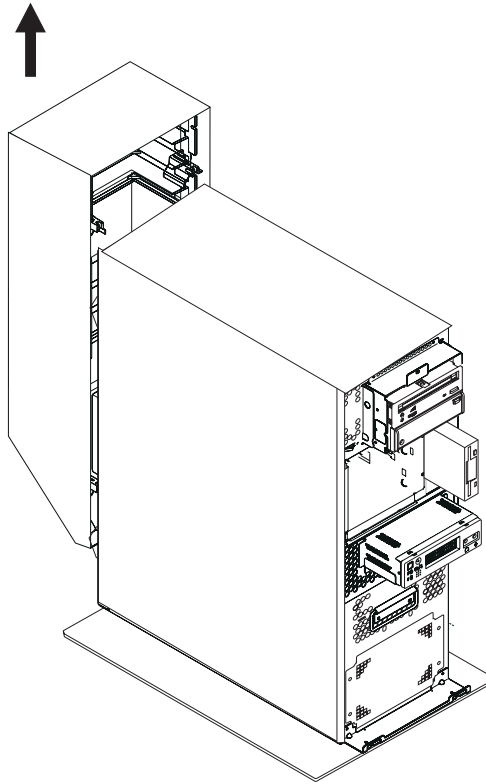
1. At a command line, enter `shutdown -F` to stop the operating system.
2. After you shut down the operating system, set the power switches of any attached devices to Off.
3. The system unit is powered down by the shut down procedure.

Removal of Covers

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 4-3.
2. To remove the front cover, grasp the front cover at the top and bottom as shown. Pull the cover out at the bottom first to ease removal.

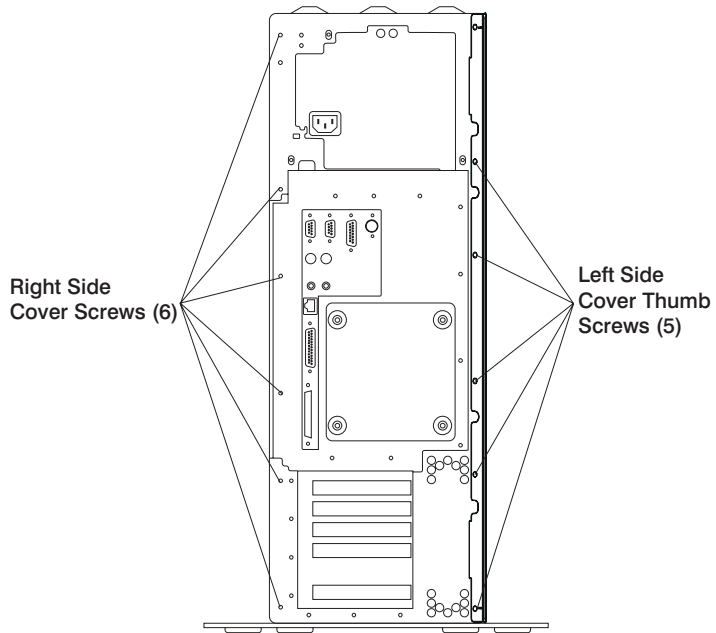


3. To remove the rear cover, lift the cover up and away from the system.

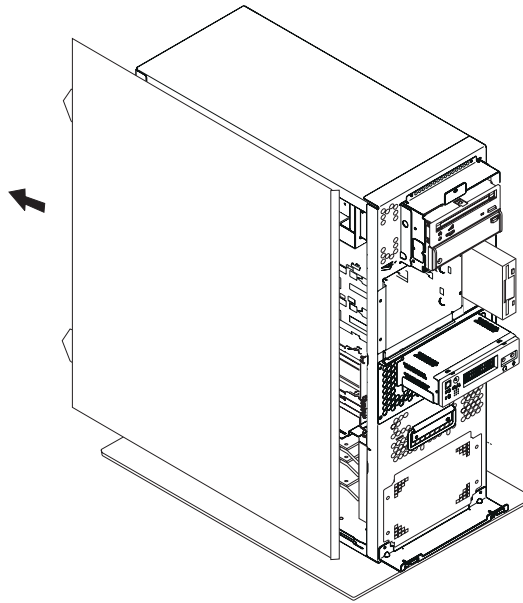


4. To remove the side covers,

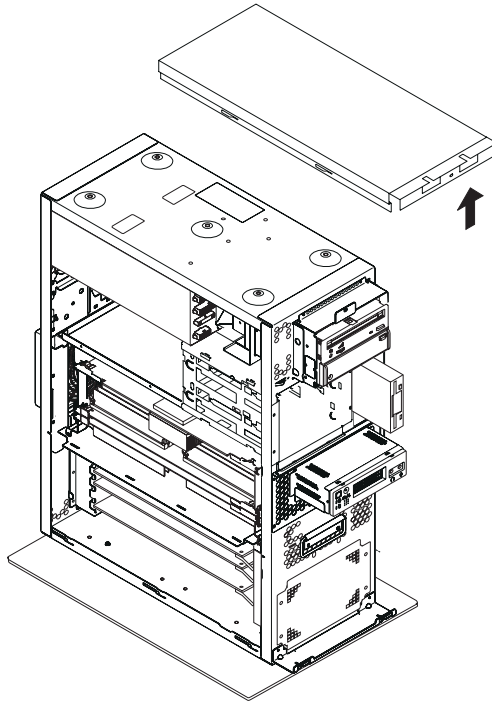
a. Remove the screws that hold the side covers to the rear frame.



b. Slide the covers to the rear and remove.

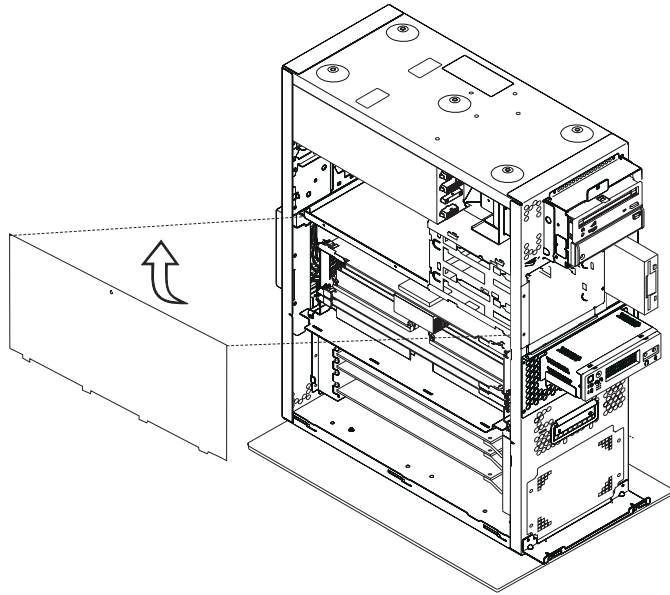


5. To remove the top cover, remove the screw at the front and the two screws at the rear and lift the cover off. (The side covers must have been removed previously).



Removal of Processor and Memory Card Cover

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 4-3.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the covers as described in “Removal of Covers” on page 4-4.
4. Remove the thumb screw securing the processor and memory card cover and remove the cover.



Replacement of Processor and Memory Card Cover

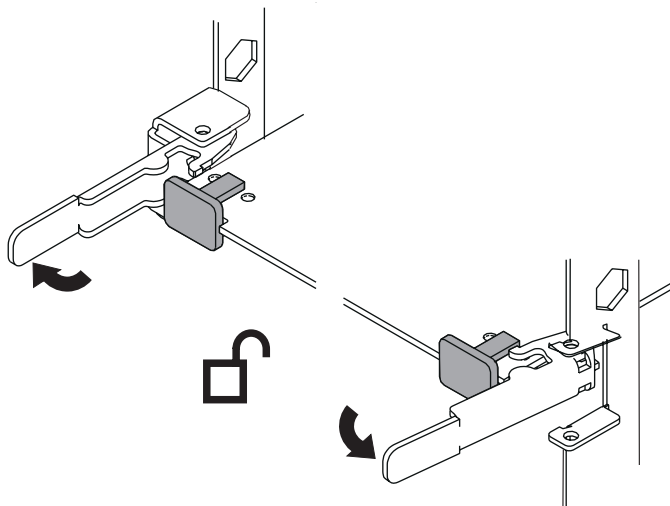
To replace the processor and memory card cover, perform the removal steps in the reverse order.

Option List

- Installing Memory Cards, see page 4-11.
- Removing Memory Cards, see page 4-13.
- Installing Memory Modules, see page 4-16.
- Removing Memory Modules, see page 4-18.
- Installing a Processor Card, see page 4-20.
- Removing a Processor Card, see page 4-22.
- Installing Adapter Cards, see page 4-24.
- Removing Adapter Cards, see page 4-25.
- Internal Drives, see page 4-26.
- Installing Disk Drives, see page 4-27.
- Removing Disk Drives, see page 4-29.
- Configuration or Deconfiguration of Media Drives see page 4-31.
- Installing a CD-ROM Drive, Tape Drive, Diskette Drive, see page 4-32.
- Removing a CD-ROM Drive, Tape Drive, Diskette Drive, see page 4-34.

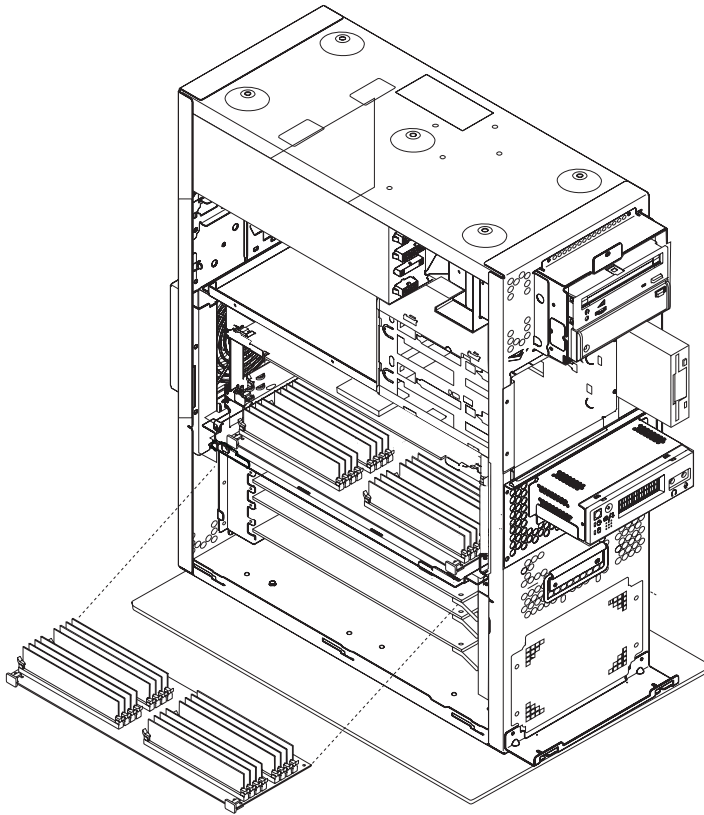
Installing Memory Cards

1. With one hand, touch any metal surface of the chassis to minimize static electrical charges, and then pick up the memory card.
2. Open the retainer latches.



3. Remove the dummy memory card if installed in the connector. If only one memory card is installed, it should be installed in bottom slot (J2).
4. Place the memory card into the card guide rails. The memory modules should face up if installing the card the top connector (J3) and face down if installing the card in the bottom connector (J2).
5. Make sure that the black tabs on the new card are captured by the latches.

6. Align the card with the connector.



7. Firmly insert the card into the connector.

8. Close the retainer latches to secure the card into the connector.

Attention: To prevent damage to the card and to the card connectors, open and close the retainer latches at the same time.

9. Install the memory card shield between the two memory cards.

10. If you have other options to install, refer to “Option List” on page 4-10.

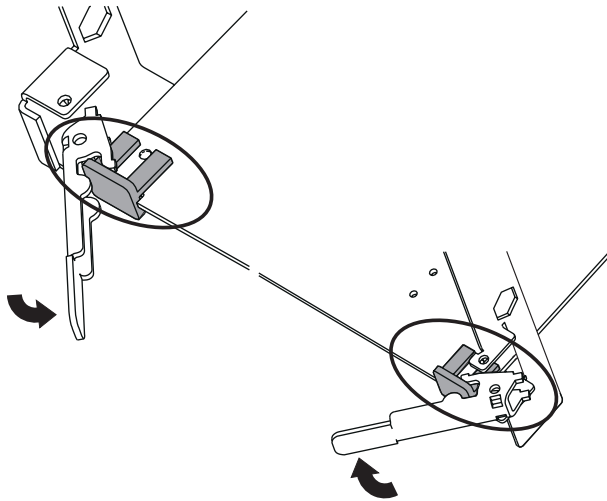
11. If you do not have other options to install, replace the processor and memory card cover as described in “Replacement of Processor and Memory Card Cover” on page 4-9.

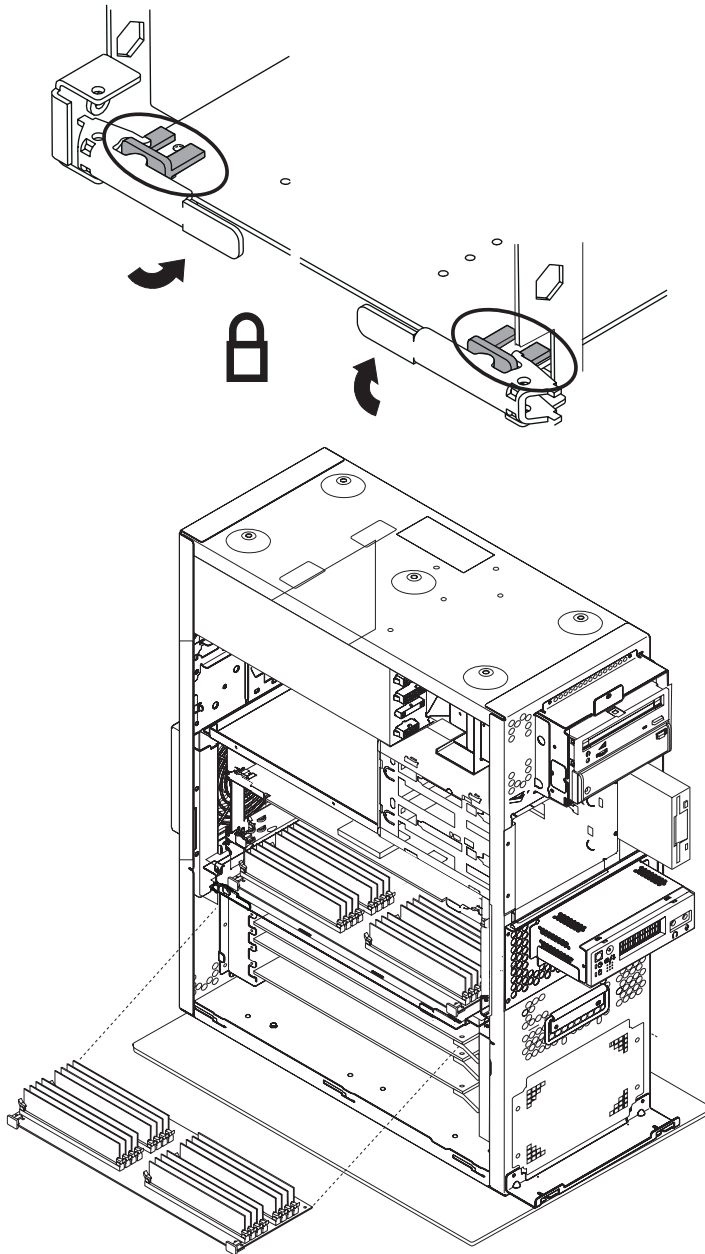
12. Replace the system unit covers as described in “Replacement of Covers” on page 4-36.

Removing Memory Cards

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 4-3.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the covers as described in “Removal of Covers” on page 4-4.
4. Remove the processor and memory card cover as described in “Removal of Processor and Memory Card Cover” on page 4-9.
5. Remove the memory card shield from in between the two memory cards.
6. The card is secured in place with latches at each end of its connection to the system board. Open the card latches and remove the card.

Attention: To prevent damage to the card and to the card connectors, open and close the latches at the same time.



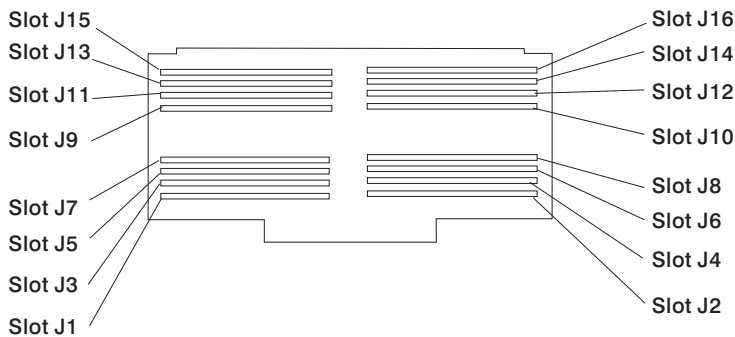


7. If you have other options to install, refer to “Option List” on page 4-10.
8. If you do not have other options to install, replace the processor and memory card cover as described in “Replacement of Processor and Memory Card Cover” on page 4-9.

9. Replace the system unit covers as described in “Replacement of Covers” on page 4-36.

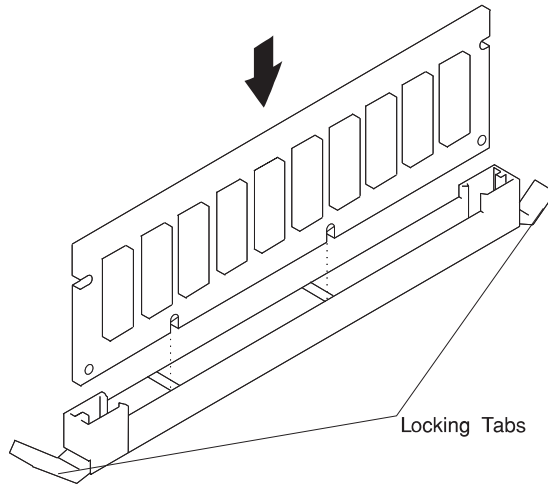
Installing Memory Modules

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 4-3.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the covers as described in “Removal of Covers” on page 4-4.
4. If you have not already done so, remove the processor and memory card cover as described in “Removal of Processor and Memory Card Cover” on page 4-9.
5. If you have not already done so, remove the memory card as described in “Removing Memory Cards” on page 4-13.
6. With one hand, touch any metal surface of the chassis to minimize static electrical charges, and then pick up the memory module.
7. Locate the memory module connector on the memory card and remove the dummy memory module from the connector.



Note: Memory modules must be installed in pairs and in the correct slot configuration. (Slots J1 and J2, J3 and J4, J5 and J6, etc.)

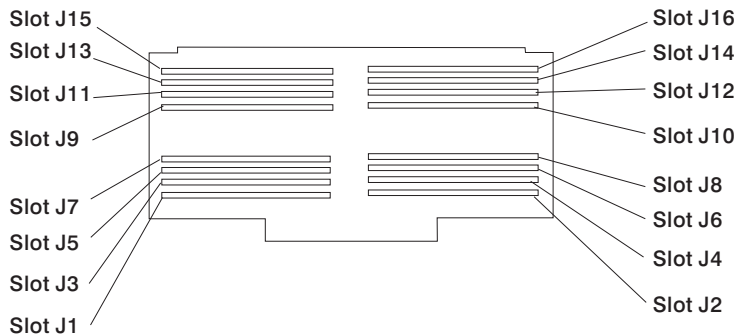
8. Insert the memory module firmly into the connector.



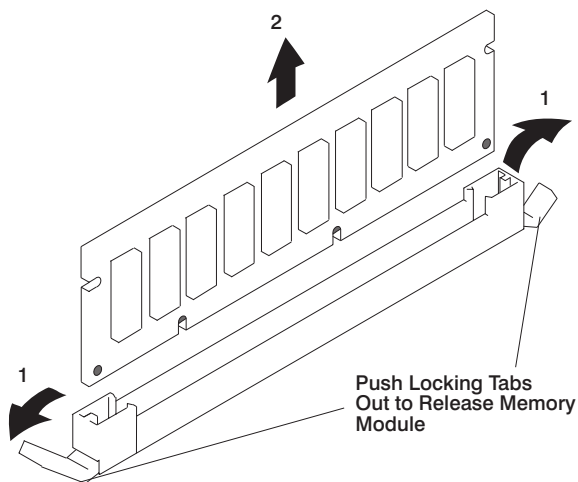
9. Secure the memory module with the locking tabs located at each end of the connector.
10. Replace the memory card into the system unit. See “Installing Memory Cards” on page 4-11 for more information.
11. If you have other options to install, refer to “Option List” on page 4-10.
12. If you do not have other options to install, replace the processor and memory card cover as described in “Replacement of Processor and Memory Card Cover” on page 4-9.
13. Replace the system unit covers as described in “Replacement of Covers” on page 4-36.

Removing Memory Modules

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 4-3.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the covers as described in “Removal of Covers” on page 4-4.
4. If you have not already done so, remove the processor and memory card cover as described in “Removal of Processor and Memory Card Cover” on page 4-9.
5. If you have not already done so, remove the memory card as described in “Removing Memory Cards” on page 4-13.
6. Locate the memory module connectors and determine which module you want to remove.



7. Remove the memory module by pushing the tabs out on the memory connectors.



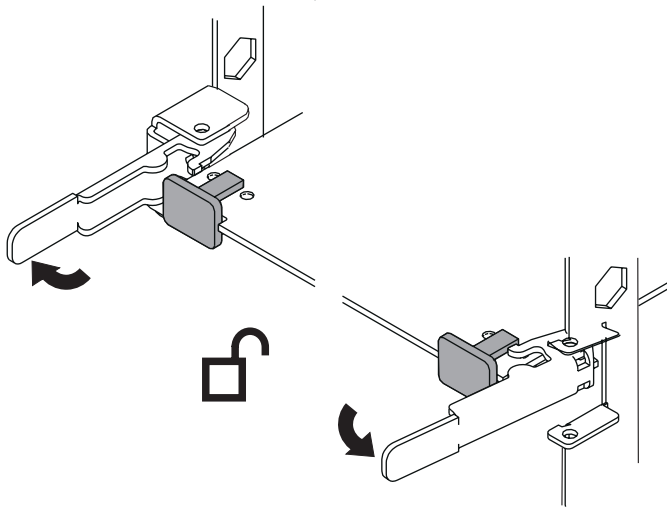
8. If you have other options to install, refer to “Option List” on page 4-10.
9. If you do not have other options to install, replace the processor and memory card cover as described in “Replacement of Processor and Memory Card Cover” on page 4-9.
10. Replace the system unit covers as described in “Replacement of Covers” on page 4-36.

Installing a Processor Card

Installing a processor card into your system unit may require updating the firmware. A diskette or CD-ROM is included with your new processor card if that is required.

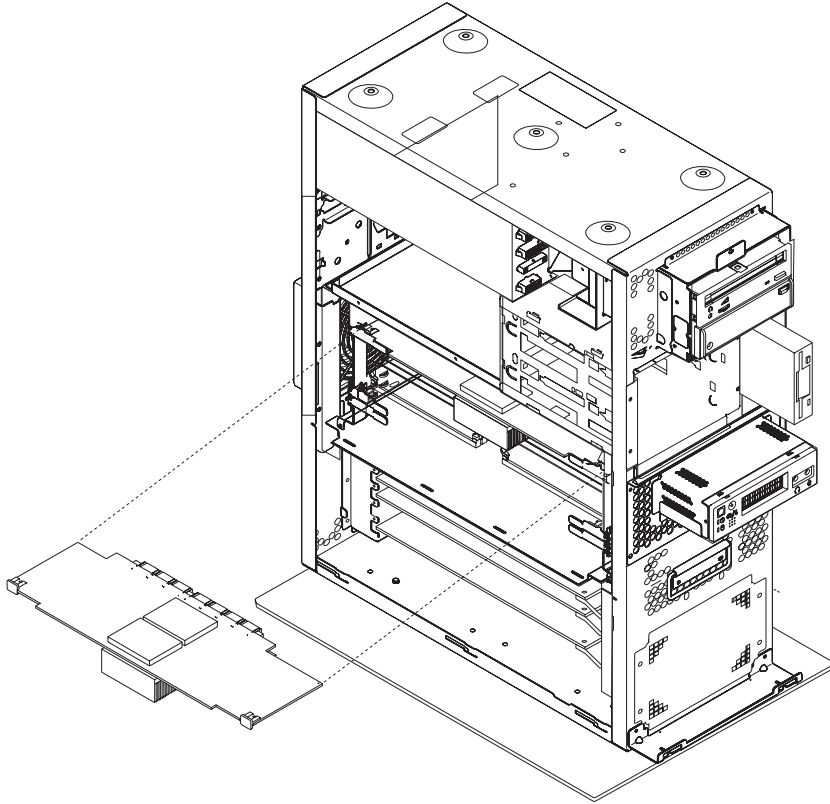
Attention: If your system unit has two processor cards, both processor cards must be of the same clock speed.

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 4-3.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the covers as described in “Removal of Covers” on page 4-4.
4. Remove the processor and memory card cover as described in “Removal of Processor and Memory Card Cover” on page 4-9.
5. If you have not already done so, open the card retainer latches on both ends of the card connector.



6. Remove the dummy processor card if installed in the card connector.

7. Place the processor card in the processor card guide rails.
8. Carefully align the processor card with the card connector.

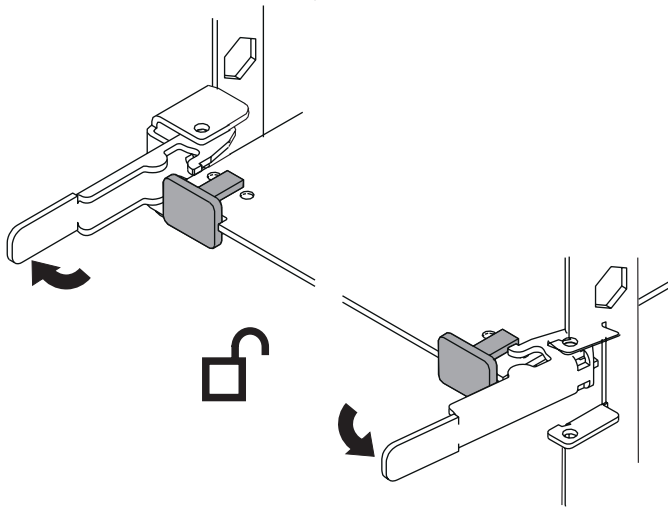


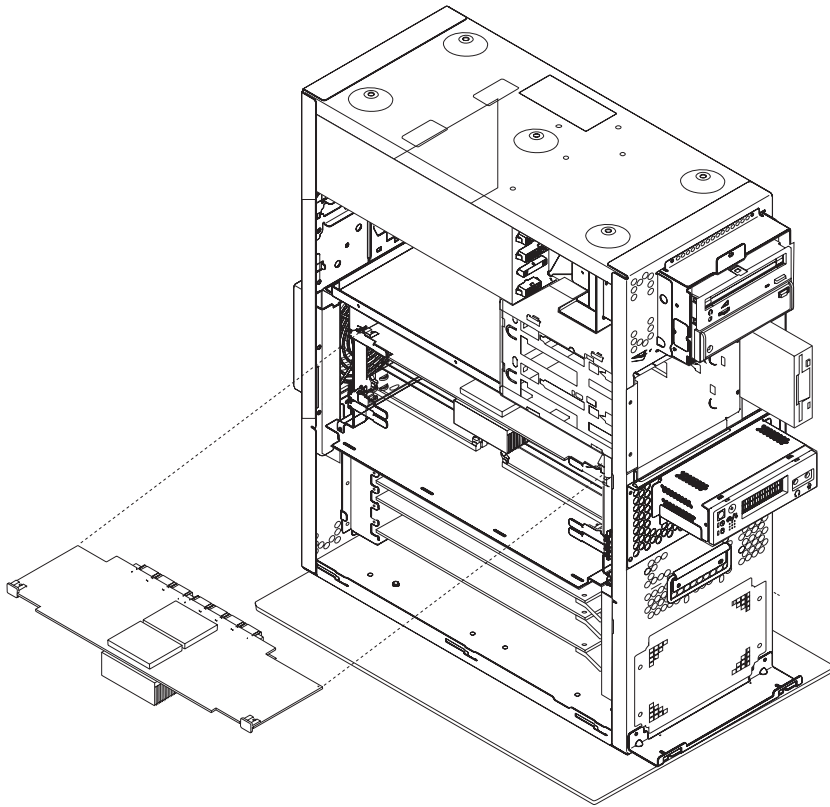
9. Firmly insert the processor card into the card connector.
10. Close the retainer latches to secure the processor card. Ensure that the processor card is fully seated.
Attention: To prevent damage to the card and to the card connectors, open and close the retainer latches at the same time.
11. If you have other options to install, refer to “Option List” on page 4-10.
12. If you do not have other options to install, replace the processor and memory card cover as described in “Replacement of Processor and Memory Card Cover” on page 4-9.
13. Replace the system unit covers as described in “Replacement of Covers” on page 4-36.

Removing Processor Card

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 4-3.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the covers as described in “Removal of Covers” on page 4-4.
4. Remove the processor and memory card cover as described in “Removal of Processor and Memory Card Cover” on page 4-9.
5. The processor card is secured in place with card retainer latches, one on each end of the card. Open the card retainer latches and remove the card from the connector.

Attention: To prevent damage to the card and the card connectors, open and close the retainer latches at the same time.

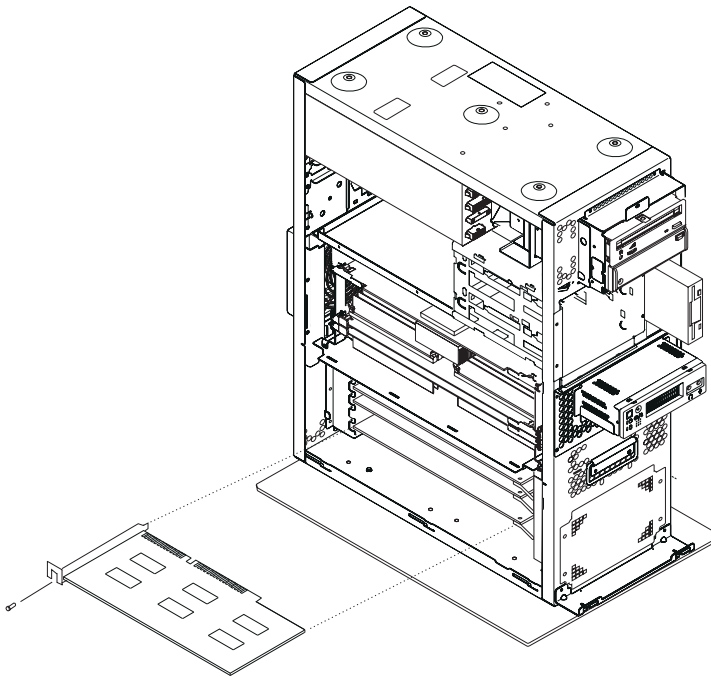




6. If you have other options to install, refer to “Option List” on page 4-10.
7. If you do not have other options to install, replace the processor and memory card cover as described in “Replacement of Processor and Memory Card Cover” on page 4-9.
8. Replace the system unit covers as described in “Replacement of Covers” on page 4-36.

Installing Adapter Cards

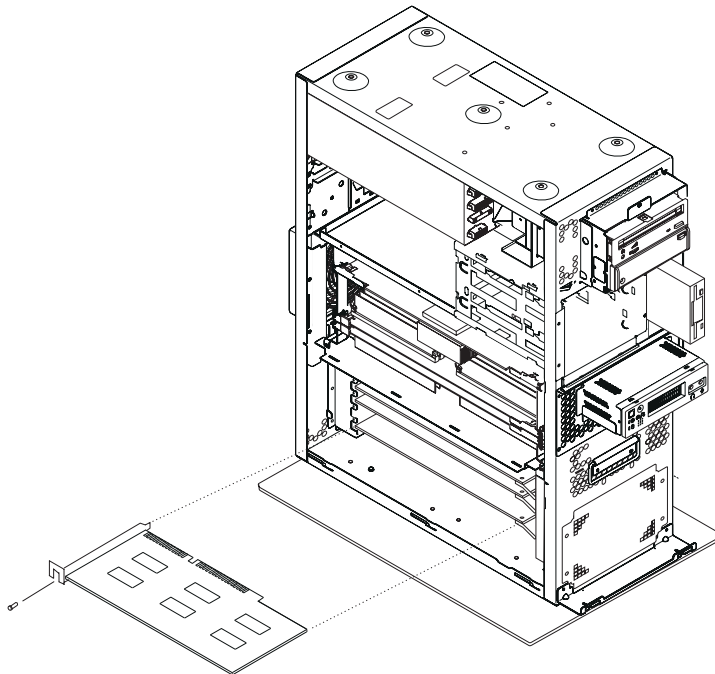
1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 4-3.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the covers as described in “Removal of Covers” on page 4-4.
4. Carefully grasp the adapter by the edges and align the adapter with the expansion-slot connector.



5. Press the adapter firmly into the expansion-slot connector.
6. Connect appropriate cables to the adapter.
7. If you have other options to install, refer to “Option List” on page 4-10.
8. If you do not have other options to install, replace the system unit covers as described in “Replacement of Covers” on page 4-36.

Removing Adapter Cards

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 4-3.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the covers as described in “Removal of Covers” on page 4-4.
4. If your system unit has a cover over the adapter card slots, remove it at this time.
5. Disconnect any cables that are connected to the adapter being removed.
6. Remove the screw that holds the adapter bracket to the system unit.
7. Remove the adapter from the system unit.



8. If your system unit had a cover over the adapter card slots, replace it at this time.
9. If you have other options to install, refer to “Option List” on page 4-10.
10. If you do not have other options to install, replace the system unit covers as described in “Replacement of Covers” on page 4-36.

Internal Drives

The 7043 Model 260 has 5 internal media bays.

- One 3.5 inch high diskette bay
- Two 5.25 inch high media bays, for CD-ROM drives, tape drives, or disk drives.
- Two 3.5 inch high disk drive bays.

A diskette drive and CD-ROM drive come preinstalled in all systems.

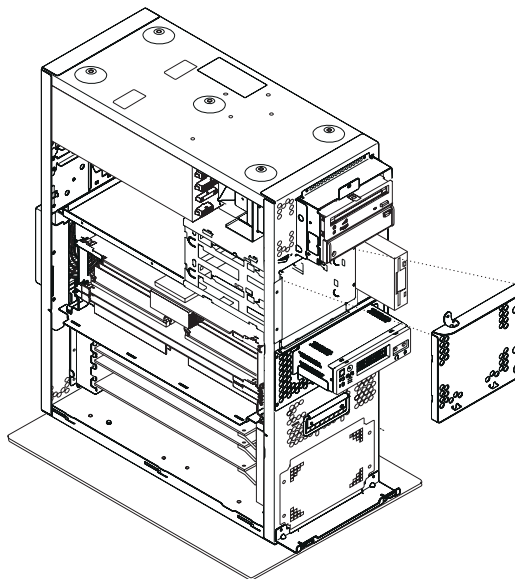
Pre-installation Steps

Consider the following cautions when installing or removing media drives into your system unit.

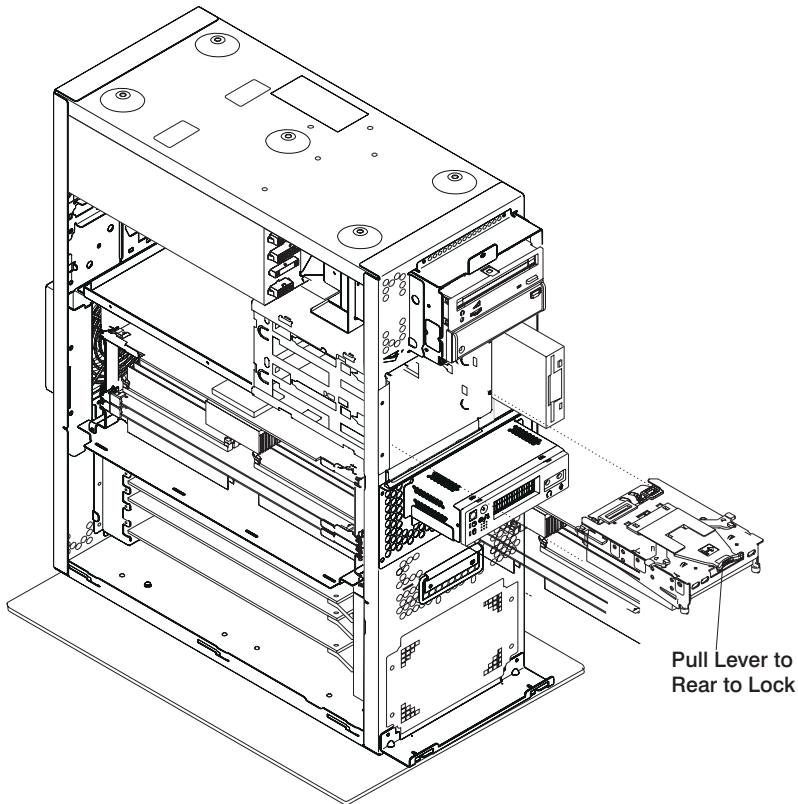
- Use caution when handling all disk drives. Disk drives are more likely to be damaged during installation and service than at any other time. A fall of as little as .25 inch, bumping, or rough handling can all cause latent failures.
- Media drives are particularly sensitive to electrostatic discharge. Follow are electro-static handling procedures prior to handling the media drive.
- Refer to the documentation that came with your drive to determine if any drive-specific procedures must be followed, such as setting switches or jumpers, or attaching the drive to a carrier tray.
- Media SCSI drives must have their SCSI address set manually. Refer to the documentation that came with your drive for more information on setting the SCSI address. Refer to “Device Records” on page A-2 for more information on SCSI addresses in your system unit.

Installing Disk Drives

1. If you have not already done so, remove the front cover as described in "Removal of Covers" on page 4-4.
2. If the system has a padlock or cable securing the disk drive cage, remove the padlock or cable.
3. Loosen the retaining screw that secures the disk drive cage cover to the disk drive cage and remove the cover.



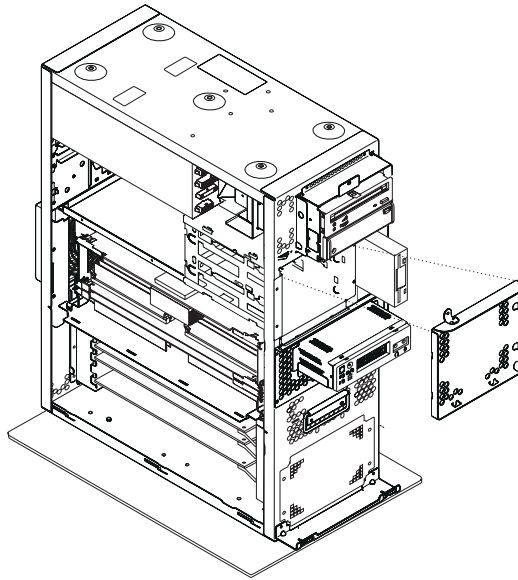
4. Align the drive with the disk drive cage rails.
5. Slide the drive into the system unit until it connects with the backplane at the rear of the drive bay.



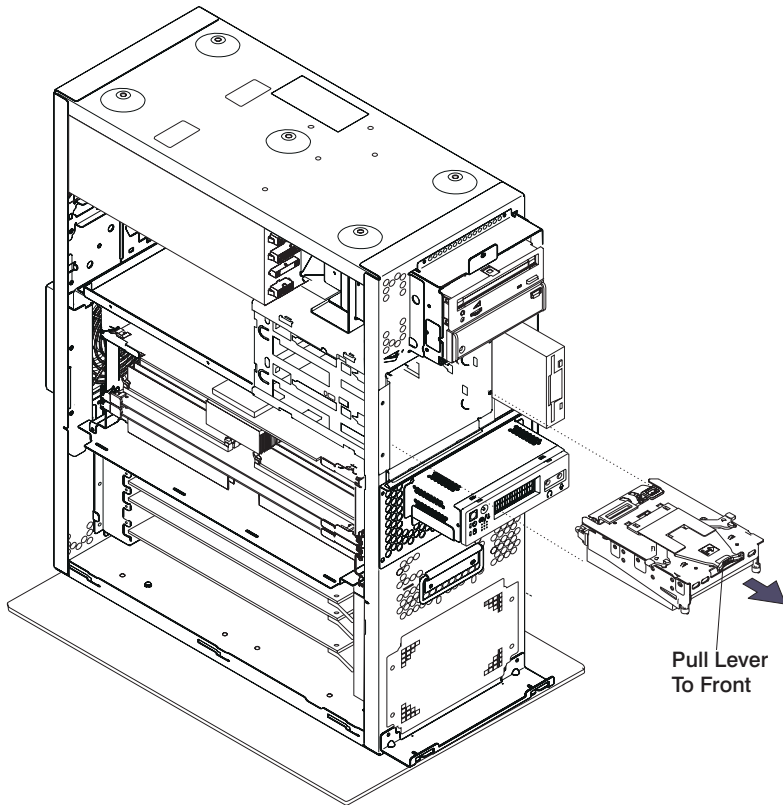
6. Push the disk drive lever to the rear to lock the disk drive.
7. Configure the drive using **smit**. Then wait five minutes for the drive to warmup. See "Configuration of Media Drives" on page 4-31 for instructions on configuring the drive.
8. If you have other options to install, refer to "Option List" on page 4-10.
9. If you do not have other options to install, replace the front cover as described in "Replacement of Covers" on page 4-36.

Removing Disk Drives

1. Deconfigure the drive you wish to remove. See “Deconfiguration of Media Drives” on page 4-31 for instructions.
2. If you have not already done so, remove the front cover as described in “Removal of Covers” on page 4-4.
3. If the system has a padlock or cable securing the disk drive cage, remove the padlock or cable.
4. Loosen the retaining screw that secures the disk drive cage cover to the disk drive cage and remove the cover.



5. Locate the drive you wish to remove.
6. Pull the disk drive lever toward you and remove the drive unit from the system unit .



Configuration of Media Drives

If you need to configure a disk drive, use the following procedure:

1. Login as root.
2. Enter the **smit** command.
3. Select **Devices**.
4. Determine the type of disk drive you want to configure. Select that type of drive from the menu.
5. Select **Add a drive type**, where *drive type* is the type of drive you are configuring.
6. A list appears listing various models of the drive type you selected. Select the specific type of drive you are adding.

Deconfiguration of Media Drives

1. Login as root.
2. Enter the **smit** command.
3. Select **Devices**.
4. Determine the type of disk drive you want to remove or deconfigure. Select that type of drive from the menu.
5. When you get to the Keep Definition option, select **Yes**. This selection retains the details of the drive in the device configuration database.
6. A list appears listing various models of the drive type you selected. Select the specific type of drive you are removing.
7. Select the **Do** option to unconfigure the drive.

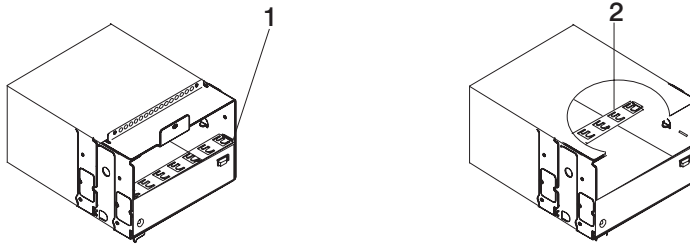
Installing a CD-ROM Drive, Tape Drive, Diskette Drive



CAUTION:

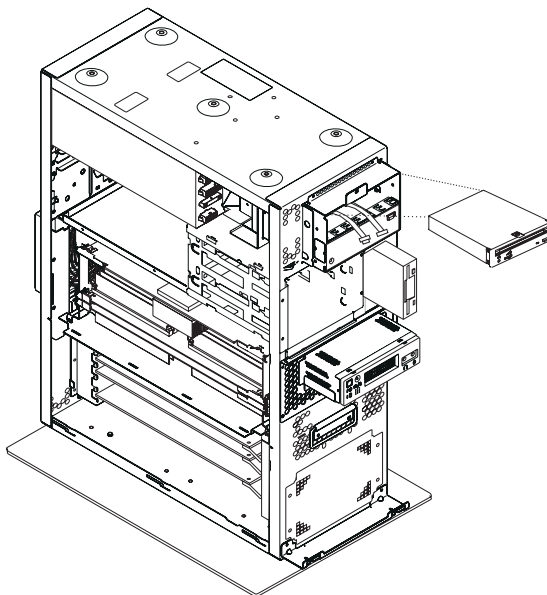
Do not open the drive; no user adjustments or serviceable parts are inside.

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 4-3.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the left side, right side, and front covers as described in “Removal of Covers” on page 4-4.
4. If you are installing a 6156 8MM tape drive, in your system unit remove the top cover, “Removal of Covers” on page 4-4. if not go to step 5
 - a. When installing the 6156 8MM tape drive, move the EMC clip from the front (1) to the back (2). Make sure the rounded part of the EMC clip is facing down. (If there are two EMC clips remove the front clip and leave the one in the back).
 - b. Pull the tab that is located on the left side out a little way to remove and or move the EMC clip.



5. Connect the cables from the front of the system.
 - a. Locate the appropriate data cable for the drive. Connect the cable to the connector at the rear of the drive.
 - b. If you are installing a CD-ROM drive, connect the audio cable from the I/O board to the audio connector at the rear of the drive.
 - c. If you are installing a SCSI drive, set the SCSI address jumpers at the rear of the drive to the correct address. Refer to the documentation that came with your drive for details on setting the SCSI address.
 - d. The two media bays share a common power cable. Connect an available connector on the power cable to the 4-pin connector at the rear of the drive.

6. Align the drive with the guides at the edge of the bay and slide the drive into the system unit until it stops.
7. Secure the media drive to the system unit with the retaining screws.
8. If you have other options to install, refer to “Option List” on page 4-10.
9. If you do not have other options to install, replace the system unit covers as described in “Replacement of Covers” on page 4-36.



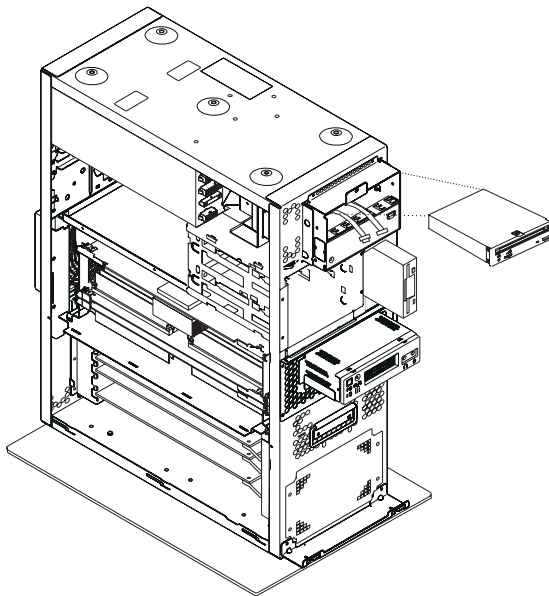
Removing a CD-ROM Drive, Tape Drive, Diskette Drive



CAUTION:

Do not open the drive; no user adjustments or serviceable parts are inside.

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 4-3.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the left side and front covers as described in “Removal of Covers” on page 4-4. It may help removal if you remove the right cover but it is not necessary at this time.
4. Remove the screws that secure the media drive to the system unit.
5. Slide the drive forward toward the front of the system unit.



6. Disconnect the power and data cables from the drive you are removing.
7. If you are removing a CD-ROM drive, disconnect the audio cable from the rear of the CD-ROM drive.
8. If you have other options to install, refer to “Option List” on page 4-10.

9. If you do not have other options to install, replace the system unit covers as described in “Replacement of Covers” on page 4-36.

Replacement of Covers

1. To replace the top cover, place the cover on top of the system and secure with the screws removed earlier.
2. To replace the side covers:
 - a. Insert the tabs on the side covers into the slots on the enclosure.
 - b. Slide the covers toward the front of the enclosure until it latches into place.
 - c. Secure the rear of the covers with the screws removed earlier.
3. To replace the front cover, align the tabs on the front cover with the slots on the system unit enclosure. Insert the front cover until it is secure.
4. To replace the rear cover, align the tabs on the side covers with the slots on the rear cover and slide the cover down until it latches into place.

Chapter 5. Using the Stand-alone and Online Diagnostics

Sources for the Diagnostic Programs

The diagnostics consist of Stand-alone Diagnostics and Online Diagnostics. Stand-alone Diagnostics are resident on removable media. They must be booted before they can be 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.

Stand-alone and Online Diagnostics Operating Considerations

The following items identify some things to consider before using the diagnostics.

- Run Online Diagnostics in Service Mode when possible, unless otherwise directed. The Online Diagnostics perform additional functions, compared to Stand-alone Diagnostics. This ensures that the error state of the system is captured in NVRAM for your use in fixing the problem. The AIX error log and 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 Stand-alone 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 beware that it may not work properly since the AIX support for the terminal may not be installed.

Selecting a Console Display

When you run Stand-alone 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 port.

Identifying the Terminal Type to the Diagnostics Programs

Note: This is a different function than 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 adapter-attached 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 re-displayed 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 which the system is being run:

- Online Normal or Maintenance Mode - The command prompt appears.
- Stand-alone 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 Stand-alone Diagnostics

Consider the following when you run Stand-alone Diagnostics:

- The diagnostic disc must remain in the CD-ROM drive for the entire time that diagnostics are executing.
- The diagnostic CD-ROM disc cannot be ejected from the CD-ROM drive once the diagnostic programs have loaded. The disc can only be ejected after the system has been powered-Off and then powered-On (Stand-alone mode) or after the diagnostics program has terminated (Online concurrent mode). The disc must be ejected before the system attempting 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 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 shutdown the AIX operating system before powering the system unit off to prevent possible damage to disk data. This is done in one of two ways:
 - If the diagnostic programs were loaded in Stand-alone mode, press the F3 key until DIAGNOSTIC OPERATING INSTRUCTIONS displays; then follow the displayed instructions to shutdown 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. For the 3151, refer to the 3151 ASCII Display Station Guide to Operations, form number GA18-2633. For the 3164, refer to the 3164 ASCII Color Display Station Description, form number GA18-2617.
- When the diagnostics present display information through the S1 port, certain attributes are used. These attributes are set as if the diagnostics were using a 3161 display terminal. Refer to the tables in Appendix B, “General Attributes Required When Using a TTY Terminal” on page B-1 for a list of attributes for the 3161 ASCII Display Terminal and for two other ASCII display terminals commonly used with the system.
- If you have a tty terminal other than a 3151, 3161 or 3164 attached to the S1 port, your terminal may have different names for the attributes. Refer to the

tables in Appendix B, "General Attributes Required When Using a TTY Terminal" on page B-1 and use the attribute descriptions to determine the settings for your terminal.

Online Diagnostics Mode 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

Service Mode

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 system resources except the SCSI adapter, and the disk drives used for paging can be tested. However, note that system memory and the processor are only tested during POST.

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

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

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 the system unit's power off.
4. Turn the system unit's power on.
5. After the first POST indicator appears on the system unit's console, press F6 on the direct attached keyboard or 6 on the tty keyboard to indicate that diagnostics are to be loaded.

Note: The term "POST indicator" refers to the ICONS (graphic display) or device mnemonics (ASCII terminal) that are displayed while the POST are executing.

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 checkout 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 shutdown the diagnostics before turning off the system unit.

Note: Pressing the F3 key (from a defined terminal) produces a "Confirm Exit" popup menu which offers two options: continuing with the shutdown 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.

Concurrent Mode

Concurrent mode provides a way 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, some of the resources cannot be tested in concurrent mode. The following resources cannot be tested in concurrent mode:

- SCSI adapters connected to paging devices
- The disk drive used for paging
- Any graphics related device if 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.

Running the Online Diagnostics in Concurrent Mode

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.

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.

Running the Online Diagnostics in Maintenance Mode

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* and use the **shutdown -m** and **diag** commands. Use the following steps to run the Online diagnostics in maintenance mode:

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

Stand-alone Diagnostic Operation

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

Error Log Analysis is not done by the Stand-alone Diagnostics.

If running from CD-ROM, the CD-ROM drive and the SCSI controller that controls it cannot be tested by the Stand-alone Diagnostics.

Running the Stand-alone Diagnostics

To run Stand-alone 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-ROMs.
3. Turn the system unit's power off.
4. Set the key mode switch to the service position.
5. Turn the system unit's power on.
6. Insert the diagnostic media drive.
7. When the keyboard POST indicator appears, press the F5 key on the direct attached keyboard, or the number 5 key on the tty keyboard.
8. Enter any requested passwords.
9. Follow any instruction to select the console.
10. After the diagnostic controller loads, DIAGNOSTIC OPERATING INSTRUCTIONS appear on the console display.
11. Follow the displayed instructions to checkout the desired resources.
12. When testing is complete; use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS.

Location Codes

This system unit uses physical location codes in conjunction with AIX location codes to provide mapping of the failing field replaceable units. The location codes are produced by the system unit's firmware and AIX.

Physical Location Codes

Physical location codes provide a mapping of logical functions in a platform (or expansion sites for logical functions, such as connectors or ports) to their specific locations within the physical structure of the platform.

Location Code Format

The format for the location code is an alphanumeric string of variable length, consisting of a series of location identifiers, separated by the standard dash (-) or slash (/) character. The series is hierarchical; that is, each location identifier in the string is a physical child of the one preceding it.

- The - (dash) separator character represents a normal structural relationship where the child is a separate physical package and it plugs into (or is connected to) the parent. For example, P1-C1 is a CPU card (C1) plugged into a planar (P1), or P1-M1 is a memory card (M1) plugged into a planar (P1).
- The / (slash) separator character separates the base location code of a function from any extended location information. A group of logical devices can have the same base location code because they are all on the same physical package, but may require extended location information to describe the connectors they support. For example, P2/S1 describes the location of the serial port 1 controller and its connector (S1), which is located on planar P2 (its base location code), but the / indicates that further devices can be connected to it at the external S1 serial connector. The keyboard controller and its connector likewise have location code P2/K1, which means they have the same base location code (P2) as serial port 1, but a different external connector. In contrast, the location code P2-K1 actually points to the device connected to connector K1; that is, the keyboard. The location code P2/Z1 indicates an integrated SCSI controller which drives connector Z1, while location codes of P2-Z1-... point to the actual SCSI bus and devices.

Each location identifier consists of one alpha prefix character that identifies a location type, and a decimal integer number (typically one or two digits) that identifies a specific instance of this location type. Certain location types may also support secondary sub-locations, which are indicated by appending a period (".") character and a sub-location instance number.

Specifically, the format of a location code is defined as follows:

pn[.n][- or /]pn[.n][- or /]...

Where p is a defined alpha location type prefix, n is a location instance number, and [.n] is a sub-location instance number (where applicable). Sub-location notation is used only for location types which have clearly defined and limited expansion sites; for example, memory module slots on a memory card. Primarily, the [.n] sub-location notation is intended for use as an abbreviation of the location code in cases where:

1. Based on the device structure, the abbreviated sub-location code conveys the same information in a more concise form than an additional level of location identifier - for example:
 - P1-M1.4 (pluggable module 4 on Memory Card 1 on Planar 1), rather than P1-M1-M4
 - P1-C1.1 (pluggable CPU 1 on CPU Card 1 on Planar 1), rather than P1-C1-C1
 - P2-Z1-A3.1 (LUN 1 at SCSI ID 3 on integrated SCSI bus 1 from Planar 2), rather than P2-Z1-A3-A1
2. The sub-location is either a basic physical extension or sub-enclosure of the base location, but does not represent additional function or connectivity; for example, a drawer in a rack (U1.2) or a riser card on an I/O board (P2.1).

AIX and Physical Location Code Reference Table

FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
Central Electronics Complex (CEC)				
System board	00-00	P1		
Processor card 1	00-00	P1-C1	Processor connectors J8	CPU ID 0x00 and 0x01 (if 2-way card)
Processor card 2	00-02	P1-C2	Processor connector J6	CPU ID 0x04 and 0x05 (if 2-way card)
Memory card 1	00-00	P1-M1	Memory card connector J3	
Memory Card 1 modules 1 thru 16	00-00	P1-M1.1 through P1-M1.16	Memory card sockets J1,J2,J3,J4, J5,J6,J7,J8 J9,J10,J11,J12, J13,J14,J15,J16	Extents: 8L,8H,10L,10H, 12L,12H,14L,14H 9L,9H,11L,11H, 13L,13H,15L,15H
Memory card 2	00-00	P1-M2	Memory card connector J2	
Memory card 2 modules 1 thru 16	00-00	P1-M2.1 through P1-M2.16	Memory card sockets J1,J2,J3,J4, J5,J6,J7,J8 J9,J10,J11,J12, J13,J14,J15,J16	Extents: 8L,8H,10L,10H, 12L,12H,14L,14H 9L,9H,11L,11H, 13L,13H,15L,15H
I/O board	00-00	P2		
Integrated Devices				
Diskette Drive	01-D1-00-00	P2-D1	I/O board Connector J13	Base Address 0x0310
Keyboard	01-K1-00-00	P2-K1	I/O board connector J24	Base Address 0x0060
Mouse	01-K1-01-00	P2-O1	I/O board connector J24	0x0060
Diskette Port	01-D1	P2/D1	I/O board connector J17	0x03f0
Keyboard Port	01-K1-00	P2/K1	I/O board connector J24	0x0060
Mouse Port	01-K1-01	P2/O1	I/O board connector J24	0x0060

FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
Tablet Port	01-Q1-01-00	P2-Q1	I/O board connector J18	0x0060
Serial Port 1	01-S1	P2/S1	I/O board connector J23	0x0318
Serial Port 2	01-S2	P2/S2	I/O board connector J23	0x0218
Parallel Port	01-R1	P2/R1	I/O board connector J27	0x0378
AUI Ethernet Port	10-80	P2/E1	I/O board connector J20	Host Bridge ID00, Device 06
RJ45 Ethernet Port	10-80	P2/E1	I/O board connector J25	Host Bridge ID00, Device 06
Internal SCSI Port	10-60	P2/Z1	I/O board connector J7	Host Bridge ID00, Device 02
External SCSI Port	10-88	P2/Z2	I/O board connector J28	Host Bridge ID00, Device 07
Pluggable Adapters				
Card in PCI Slot 1P	20-58 to 20-5F	P2-I1	I/O board connector J9	Host Bridge ID01, Device 01
Card in PCI Slot 2P	20-60 to 20-67	P2-I2	I/O board connector J8	Host Bridge ID01, Device 02
Card in PCI Slot 3P	10-68 to 10-6F	P2-I3	I/O board connector J14	Host Bridge ID00, Device 03
Card in PCI Slot 4P	10-70 to 10-77	P2-I4	I/O board connector J13	Host Bridge ID00, Device 04
Card in PCI Slot 5P	10-78 to 10-7F	P2-I5	I/O board connector J12	Host Bridge ID00, Device 05
SCSI Devices				
Base CD-ROM (Bay D1)	10-60-00-1, 0	P2-Z1-A1		Primary SCSI Bus ID 1 (refer to the note at the end of this table)
Media Device in Bay D2	10-60-00-0, 0	P2-Z1-A0		Primary SCSI Bus ID 0 (refer to the note at the end of this table)
DASD in Bay D4	10-60-00-9, 0	P2-Z1-A9		Primary SCSI Bus ID 9

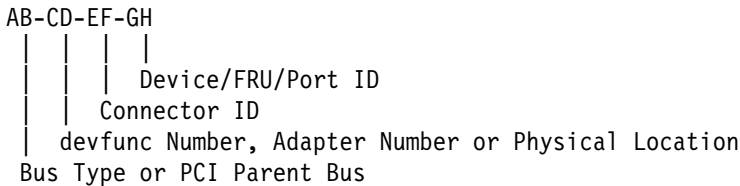
FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
DASD in Bay D5	10-60-00-8, 0	P2-Z1-A8		Secondary SCSI Bus ID 8
Fans				
I/O fan		F2	Fan connector J3 at system board	
CEC fan		F1	Fan connector J21 at system board	
I/O fan connector		P2/F2	Fan connector J3 at system board	
CEC fan connector		P2/F1	Fan connector J21 at system board	
Operator Panel				
Operator panel		L1	I/O board connector J1	
Operator panel Connector		P2/L1	I/O board connector J1	
Power Supply				
Power supply		V1		I2C Ad 92, Ch2; RTAS=9002-0
Battery				
Battery		V2	I/O board connector J11	
<p>Note: The SCSI bus ID's are the recommended values. Features installed at the manufacturing site correspond to these IDs. Field installations may not comply with these recommendations.</p>				

AIX Location Codes

The basic formats of the AIX location codes are:

- For non-SCSI devices/drives
AB-CD-EF-GH
- For SCSI devices/drives
AB-CD-EF-G,H

For planars, cards, and non-SCSI devices the location code is defined as:



- The AB value identifies a bus type or PCI parent bus as assigned by the firmware.
- The CD value identifies adapter number, adapter's devfunc number, or physical location. The devfunc number is defined as the PCI device number times 8, plus the function number.
- The EF value identifies a connector.
- The GH value identifies a port, address, device, or FRU.

Adapters and cards are identified with just AB-CD.

The possible values for AB are:

00	Processor bus
01	ISA bus
02	EISA bus
03	MCA bus
04	PCI bus used in the case where the PCI bus cannot be identified
05	PCMCIA buses
xy	For PCI adapters where x is equal to or greater than 1. The x and y are characters in the range of 0-9, A-H, J-N, P-Z (O, I, and lower case are omitted) and are equal to the parent bus's ibm, aix-loc Open Firmware Property.

The possible values for CD depend on the adapter/card.

For pluggable PCI adapters/cards, CD is the device's devfunc number (PCI device number times 8, plus the function number). The C and D are characters in the range

of 0-9, and A-F (hex numbers). This allows the location code to uniquely identify multiple adapters on individual PCI cards.

For pluggable ISA adapters, CD is equal to the order the ISA cards defined/configured either by SMIT or the ISA Adapter Configuration Service Aid.

For integrated ISA adapters, CD is equal to a unique code identifying the ISA adapter. In most cases this is equal to the adapter's physical location code. In cases where a physical location code is not available, CD is FF.

EF is the connector ID. It is used to identify the adapter's connector that a resource is attached to.

GH is used to identify a port, device, or FRU. For example:

- For async devices GH defines the port on the fanout box. The values are 00 to 15.
- For a diskette drive H defines which diskette drive 1 or 2. G is always 0.
- For all other devices GH is equal to 00.

For integrated adapter, EF-GH is the same as the definition for a pluggable adapter. For example, the location code for a diskette drive is 01-D1-00-00. A second diskette drive is 01-D1-00-01.

For SCSI the location code is defined as:

```
AB-CD-EF-G,H
|  |  |  |  |
|  |  |  |  | Logical Unit address of the SCSI Device
|  |  |  |  | Control Unit Address of the SCSI Device
|  |  |  |  | Connector ID
|  |  |  |  | devfunc Number, Adapter Number or Physical Location
|  |  |  |  | Bus Type or PCI Parent Bus
```

Where AB-CD-EF are the same as non-SCSI devices.

G defines the control unit address of the device. Values of 0 to 15 are valid.

H defines the logical unit address of the device. Values of 0 to 255 are valid.

There is also a bus location code that is generated as '00-XXXXXXXX' where XXXXXXXX is equivalent to the node's unit address.

Examples of physical location codes displayed by AIX are:

Processor Card in slot 1 of planar 1

P1-C1

Memory module in system planar slot 2

P1-M2

Memory module 12 in card in slot 2 of system planar

U1-P1-M2.12

Examples of AIX location codes displayed are:

Integrated PCI adapter

10-80

Ethernet

10-60

Integrated SCSI Port 1

10-88

Integrated SCSI Port 2

Pluggable PCI adapters

20-58 to 20-5F

Any PCI card in slot 1

20-60 to 20-67

Any PCI card in slot 2

10-68 to 10-6F

Any PCI card in slot 3

10-70 to 10-77

Any PCI card in slot 4

10-78 to 10-7F

Any PCI card in slot 5

Integrated ISA adapters

01-D1

Diskette adapter

01-R1

Parallel port adapter

01-S1

Serial port 1 adapter

01-S2

Serial port 2 adapter

01-S3

Serial port 3 adapter

01-K1

Keyboard adapter

Device attached to SCSI controller

10-60-00-4,0

Device attached to Integrated
SCSI Port 1

Chapter 6. Introduction to Diagnostic 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 describes 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 Stand-alone Diagnostics. Still other programs may only be supported on a particular system architecture, such as CHRP (Common Hardware Reference Platform), or RSPC (PowerPC Reference Platform). The 7043 Model 260 is a CHRP architecture system.

To perform one of these tasks, use the Task Selection option from the FUNCTION SELECTION menu.

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

A fast path method is also available to perform a task by using the **diag** command and the **-T** flag. This means the user does not have to go through most of the introductory menus just to get to a particular task. Instead, the user is presented with a list of resources available to support the specified task. The current fast path tasks are:

- 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 this chapter to understand which flags are needed for a given task.

Tasks

The following tasks are described in this chapter:

- 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 ISA Adapters
- Configure Reboot Policy
- Configure Remote Maintenance Policy
- Configure Ring Indicate Power On
- 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
- Local Area Network Analyzer
- Periodic Diagnostics
- PCI RAID Physical Disk Identify
- Process Supplemental Media
- Run Diagnostics

- Run Error Log Analysis
- Run Exercisers
- Save or Restore Hardware Management Policies
- Save or Restore Service Processor Configuration
- SCSI Bus Analyzer
- SCSI Device Identification and Removal
- SCSD Tape Drive Service Aid
- Spare Sector Availability
- SSA Service Aid
- Update Disk Based Diagnostics
- Update System or Service Processor Flash
- Update System Flash
- 7135 RAIDiant Array Service Aids
- 7318 Serial Communication Network Server

Add Resource to Resource List

Use this task to add resources back to the resource list.

Note: Only resources that were previously detected by the diagnostics and deleted from the Diagnostic Test List are listed. If no resources are available to be added, then none are listed.

AIX Shell Prompt

Note: Use in Online Service Mode only.

This service aid allows access to the AIX command line. To use this service aid the user must know the root password (when a root password has been established).

Note: Do not use this task to install code, or change the configuration of the system. This task is intended to view files, configuration records, and data. Changing the system configuration or installing code with this service aid may produce unexplained system problems after exiting the diagnostics.

Analyze Adapter Internal Log

The PCI RAID adapter has an internal log that logs information about the adapter and the disk drives attached to the adapter. Whenever data is logged in the internal log, the device driver copies the entries to the AIX system error log and clears the internal log.

The Analyze Adapter Internal Log service aid analyzes these entries in the AIX system error log. The service aid displays the errors and the associated service actions. Entries that do not require any service actions are ignored.

Backup and Restore Media

This service aid allows verification of backup media and devices. It presents a menu of tape and diskette devices available for testing and prompts for selection of the desired device. It then presents a menu of available backup formats and prompts for selection of the desired format. The supported formats are tar, backup, and cpio. After the device and format are selected, the service aid backups a known file to the selected device, restores that file to **/tmp**, and compares the original file to the restored file. The restored file is also left in **/tmp** to allow for visual comparison. All errors are reported.

Certify Media

This task allows the selection of diskette or hardfiles to be certified.

Hardfiles can be connected either to a SCSI adapter (non-RAID) or a PCI SCSI RAID adapter. The usage and criteria for a hardfile connected to a non-RAID SCSI adapter are different from those for a hardfile connected to a PCI SCSI RAID adapter.

- Certify Diskette

This selection provides a way to verify the data written on a diskette. When this service aid is selected, a menu asks you to select the type of diskette being verified. The program then reads all of the ID and data fields on the diskette one time and displays the total number of bad sectors found.

- Certify Hardfile Attached to a Non-RAID SCSI Adapter

This selection reads all of the ID and data fields. It checks for bad data and counts all errors encountered. If the unrecovered data errors exceed the threshold value, the hardfile needs to be formatted and certified. If the recovered data errors, recovered and unrecovered equipment errors exceed the threshold values, the disk needs to be replaced.

This task may be run directly from the AIX command line. The following usage statement describes the syntax of the command:

Usage:

```
diag -c -d <deviceName> -T "certify"
```

- Certify Hardfile attached to a PCI SCSI RAID Adapter

This selection is used to certify physical disks attached to a PCI SCSI RAID adapter. Certify reads the entire disk and checks for recovered errors, unrecovered errors and reassigned errors. If these errors exceed the threshold values, the user is prompted to replace the physical disk.

This task may be run directly from the AIX command line. The following usage statement describes the syntax of the command:

Usage:

```
diag -c -d < RAID adapterName > -T "certify {-l < chID > | -A}"
```

Flag	Description
-l	Physical Disk channel/ID (example: 27)
-A	All disks.

Change Hardware Vital Product Data

Use this service aid to display the Display/Alter VPD Selection Menu. The menu lists all resources installed on the system. When a resource is selected a menu is displayed that lists all the VPD for that resource.

Note: The user cannot alter the VPD for a specific resource unless it is not machine readable.

Configure Dials and LPFKeys

This service aid provides a tool for configuring and removing dials/LPFKeys to the asynchronous serial ports.

Since version 4.1.3 a tty must be defined on the async port before the Dials and LPFKeys can be configured on the port. Before version 4.2 the Dials and LPFKeys could only be configured on the standard serial ports. At version 4.2 the Dials and LPFKeys can be configured on any async port.

This selection invokes the SMIT utility to allow Dials and LPFKeys configuration. A tty must be in the available state on the async port before the Dials and LPFKeys can be configured on the port. The task allows an async adapter to be configured, then a tty port defined on the adapter, and then Dials and LPFKeys can be defined on the port.

Configure ISA Adapter

This task invokes SMIT to allow the identification and configuration of ISA adapters on systems that have an ISA bus and adapters.

Diagnostic support for ISA adapters not shown in the list may be supported from a supplemental diskette. ISA adapter support can be added from a supplemental diskette with the Process Supplemental Media task.

Whenever an ISA adapter is installed, this service aid must be run and the adapter configured before the adapter can be tested. This service aid must also be run to remove an ISA adapter from the system whenever an ISA adapter is physically removed from the system.

If diagnostics are run on an ISA adapter that has been removed from the system, the diagnostics fail because the ISA adapter cannot be detected by the system.

Configure Reboot Policy

This service aid controls how the system tries to recover from a system crash.

Use this service aid to display and change the following settings for the Reboot Policy.

Note: Because of system capability, some of the following settings may not be displayed by this service aid.

- Maximum Number of Reboot Attempts

Enter a number that is 0 or greater.

Note: A value of 0 indicates 'do not attempt to reboot' to a crashed system.

This number is the maximum number of consecutive attempts to reboot the system. The term "reboot", in the context of this service aid, is used to describe bringing system hardware back up from scratch, for example from a system reset or power on.

When the reboot process completes successfully, the reboot attempts count is reset to 0, and a "restart" begins. The term "restart", in the context of this service aid, is used to describe the operating system activation process. Restart always follows a successful reboot.

When a restart fails, and a restart policy is enabled, the system attempts to reboot for the maximum number of attempts.

- Use the O/S Defined Restart Policy (1=Yes, 0=No)

When 'Use the O/S Defined Restart Policy' is set to Yes, the system attempts to reboot from a crash if the operating system has an enabled Defined Restart or Reboot Policy.

When 'Use the O/S Defined Restart Policy' is set to No, or the operating system restart policy is undefined, then the restart policy is determined by the 'Supplemental Restart Policy'.

- Enable Supplemental Restart Policy (1=Yes, 0=No)

The 'Supplemental Restart Policy', if enabled, is used when the O/S Defined Restart Policy is undefined, or is set to False.

When surveillance detects operating system inactivity during restart, an enabled 'Supplemental Restart Policy' causes a system reset and the reboot process begins.

- Call-Out Before Restart (on/off)

When enabled, Call-Out Before Restart allows the system to call out (on a serial port that is enabled for call out) when an operating system restart is initiated. Such calls can be valuable if the number of these events becomes excessive, thus signalling bigger problems.

- Enable Unattended Start Mode (1=Yes, 0=No)

When enabled, 'Unattended Start Mode' allows the system to recover from the loss of AC power.

If the system was powered-on when the AC loss occurred, the system reboots when power is restored. If the system was powered-off when the AC loss occurred, the system remains off when power is restored.

This service aid may be accessed directly from the AIX command line, by entering:

```
/usr/lpp/diagnostics/bin/uspchrp -b
```

Configure Remote Maintenance Policy

The Remote Maintenance Policy includes modem configurations and phone numbers to use for remote maintenance support.

Use this service aid to display and change the following settings for the Remote Maintenance Policy.

Note: Because of system capability, some of the following settings may not be displayed by this service aid.

- Configuration File for Modem on S1
Configuration File for Modem on S2

Enter the name of a modem configuration file to load on either serial port 1 (S1) or serial port 2 (S2). The modem configuration files are located in the directory **/usr/share/modems**. If a modem file is already loaded, it is showed by 'Modem file currently loaded'.

- Modem file currently loaded on S1
Modem file currently loaded on S2

This is the name of the file that is currently loaded on serial port 1 or serial port 2.

Note: These settings are only shown when a modem file is loaded for a serial port.

- Call In Authorized on S1 (on/off)
Call In Authorized on S2 (on/off)

Call In allows the Service Processor to receive a call from a remote terminal.

- Call Out Authorized on S1 (on/off)
Call Out Authorized on S2 (on/off)

Call Out allows the Service Processor to place calls for maintenance.

- S1 Line Speed
S2 Line Speed

A list of line speeds is available by using 'List' on the screen.

- Service Center Phone Number

This is the number of the service center computer. The service center usually includes a computer that takes calls from systems with call-out capability. This computer is referred to as "the catcher". The catcher expects messages in a specific format to which the Service Processor conforms. For more information

about the format and catcher computers, refer to the README file in the AIX **/usr/samples/syscatch** directory. Contact the service provider for the correct telephone number to enter here.

- Customer Administration Center Phone Number

This is the number of the System Administration Center computer (catcher) that receives problem calls from systems. Contact the system administrator for the correct telephone number to enter here.

- Digital Pager Phone Number In Event of Emergency

This is the number for a pager carried by someone who responds to problem calls from your system.

- Customer Voice Phone Number

This is the number for a telephone near the system, or answered by someone responsible for the system. This is the telephone number left on the pager for callback.

- Customer System Phone Number

This is the number to which your system's modem is connected. The service or administration center representatives need this number to make direct contact with your system for problem investigation. This is also referred to as the Call In phone number.

- Customer Account Number

This number could be used by a service provider for record keeping and billing.

- Call Out Policy Numbers to call if failure

This is set to either 'first' or 'all'. If the call out policy is set to 'first', call out stops at the first successful call to one of the following numbers in the order listed:

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

If Call Out Policy is set to 'all', call out attempts to call all of the following numbers in the order listed:

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

- Customer RETAIN Login ID
Customer RETAIN Login Password

These settings apply to the RETAIN service function.

- Remote Timeout, in seconds
Remote Latency, in seconds

These settings are functions of the service provider's catcher computer.

- Number of Retries While Busy

This is the number of times the system should retry calls that resulted in busy signals.

- System Name (System Administrator Aid)

This is the name given to the system and is used when reporting problem messages.

Note: Knowing the system name aids the support team quickly identify the location, configuration, history, etc., of your system.

This service aid may be accessed directly from the AIX command line, by entering:

```
/usr/lpp/diagnostics/bin/uspchrp -m
```

Configure Ring Indicate Power On Policy

Note: Runs on CHRP systems units only.

This service aid allows the user to power on a system by telephone from a remote location. If the system is powered off, and Ring Indicate Power On is enabled, the system powers on at a predetermined number of rings. If the system is already on, no action is taken. In either case, the telephone call is not answered and the caller receives no feedback that the system has powered on.

Use this service aid to display and change the following settings for the Ring Indicate Power On Policy.

Note: Because of system capability, some of the following settings may not be displayed by this service aid.

- Power On Via Ring Indicate (on/off)
- Number of Rings Before Power On

This service aid may be accessed directly from the AIX command line, by entering:

```
/usr/lpp/diagnostics/bin/uspchrp -r
```

Configure Ring Indicate Power On

Note: Runs on RSPC systems units only.

This service aid allows the user to display and change the NVRAM settings for the Ring Indicate Power On capability of the service processor.

The settings allows the user to:

- Enable/Disable power on from Ring Indicate
- Read/Set the number of rings before power on

Configure Surveillance Policy

This service aid monitors the system for hang conditions, that is, hardware or software failures that cause operating system inactivity. When enabled, and surveillance detects operating system inactivity, a call is placed to report the failure.

Use this service aid to display and change the following settings for the Surveillance Policy.

Note: Because of system capability, some of the following settings may not be displayed by this service aid.

- Surveillance (on/off)

- Surveillance Time Interval

This is the maximum time between heartbeats from the operating system.

- Surveillance Time Delay

This is the time to delay between when the operating system is in control and when to begin operating system surveillance.

- Changes are to take affect immediately

Set this to Yes if the changes made to the settings in this menu are to take place immediately. Otherwise the changes takes place beginning with the next system boot.

This service aid may be accessed directly from the AIX command line, by entering:

```
/usr/lpp/diagnostics/bin/uspchrp -s
```

Create Customized Configuration Diskette

This selection invokes the Diagnostic Package Utility Service Aid which allows the user to perform the following action:

- Create a Stand-alone Diagnostic Package Configuration Diskette

The Stand-alone Diagnostic Package Configuration Diskette allows the following to be changed from the console:

- Default refresh rate for a LFT

The refresh rate used by the stand-alone diagnostic package is 60Hz. If the display's refresh rate is 77Hz, then set the refresh rate to 77.

- Different async terminal console

A console configuration file that allows a terminal attached to any RS232 or RS422 adapter to be selected as a console device can be created using this service aid. The default device is a RS232 tty attached to the first standard serial port (S1).

Delete Resource from Resource List

Use this task to delete resources from the resource list.

Note: Only resources that were previously detected by the diagnostics and have not been deleted from the Diagnostic Test List are listed. If no resources are available to be deleted, then none are listed.

Disk Maintenance

- Disk to Disk Copy
- Display/Alter Sector

Disk to Disk Copy

Notes:

1. This service aid cannot be used to update to a different size drive. The service aid only supports copying from a SCSI drive to another SCSI drive of similar size.
2. Use the **migratepv** command when copying the contents to other disk drive types. This command also works when copying SCSI disk drives or when copying to a different size SCSI disk drive. Refer to *System Management Guide: Operating System and Devices* for a procedure on migrating the contents of a physical volume.

This selection allows you to recover data from an old drive when replacing it with a new drive. The service aid recovers all LVM software reassigned blocks. To prevent corrupted data from being copied to the new drive, the service aid aborts if an unrecoverable read error is detected. To help prevent possible problems with the new drive, the service aid aborts if the number of bad blocks being reassigned reaches a threshold.

The procedure for using this service aid requires that both the old and new disks be installed in or attached to the system with unique SCSI addresses. This requires that the new disk drive SCSI address must be set to an address that is not currently in use and the drive be installed in an empty location. If there are no empty locations, then one of the other drives must be removed. Once the copy is complete, only one drive may remain installed. Either remove the target drive to return to the original configuration, or perform the following procedure to complete the replacement of the old drive with the new drive.

1. Remove both drives.
2. Set the SCSI address of the new drive to the SCSI address of the old drive.
3. Install the new drive in the old drive's location.
4. Install any other drives that were removed into their original location.

To prevent problems that may occur when running this service aid from disk, it is suggested that this service aid be run from the diagnostics that are loaded from removable media when possible.

Display/Alter Sector

This selection allows the user to display and alter information on a disk sector. Care must be used when using this service aid because inappropriate modification to some disk sectors may result in total loss of all data on the disk. Sectors are addressed by their decimal sector number. Data is displayed both in hex and in ASCII. To prevent corrupted data from being incorrectly corrected, the service aid does not display information that cannot be read correctly.

Display Configuration and Resource List

This service aid displays the item header only for all installed resources. Use this service aid when there is no need of seeing the VPD. (No VPD is displayed.)

Display Firmware Device Node Information

This task displays the firmware device node information that appears on CHRP platforms. The format of the output data may not be the same between different levels of AIX. It is intended to gather more information about individual or particular devices on the system.

Display Hardware Error Report

This service aid provides a tool for viewing the hardware error log. It uses the `errpt` command.

The Display Error Summary and Display Error Detail selection provide the same type of report as the `errpt` command. The Display Error Analysis Summary and Display Error Analysis Detail selection provide additional analysis.

Display Hardware Vital Product Data

This service aid displays all installed resources along with any VPD for those resources. Use this service aid when you want to look at the VPD for a specific resource.

Display Machine Check Error Log

Note: The Machine Check Error Log Service Aid is available only on Stand-alone Diagnostics.

When a machine check occurs, information is collected and logged in a NVRAM error log before the system unit shuts down. This information is logged in the AIX error log and cleared from NVRAM when the system is rebooted from the hard disk, LAN, or stand-alone media. When booting from Stand-alone Diagnostics, this service aid can take the logged information and turn it into a readable format that can be used to isolate the problem. When booting from the hard disk or LAN, the information can be viewed from the AIX error log using the Hardware Error Report Service Aid. In either case the information is analyzed when running the **sysplanar0** diagnostics in Problem Determination Mode.

Display Microcode Level

The following usage statements describe the syntax of the command to display the current level of microcode on an adapter or device.

Usage:

```
diag -c -d <device_name> -T "disp_mcode"
```

Display or Change Bootlist

This service aid allows the bootlist to be displayed, altered, or erased.

The system attempts to perform an IPL from the first device in the list. If the device is not a valid IPL device or if the IPL fails, the system proceeds in turn to the other devices in the list to attempt an IPL.

Display or Change Diagnostic Run Time Options

The Display or Change Diagnostic Run Time Options task allows the diagnostic run time options to be set.

Note: The run time options are used only when selecting the Run Diagnostic task.

The run time options are:

- Display Diagnostic Mode Selection Menus

This option allows the user to turn on or off displaying the DIAGNOSTIC MODE SELECTION MENU (the default is on).

- Run Tests Multiple Times

This option allows the user to turn on or off running the diagnostic in loop mode (the default is off).

Note: This option is only displayed when running Online Diagnostics in Service Mode.

- Include Advanced Diagnostics

This option allows the user to turn on or off including the Advanced Diagnostics (the default is off).

- Include Error Log Analysis

This option allows the user to turn on or off including the Error Log Analysis (ELA) (the default is off).

- Number of Days Used to Search Error Log

This option allows the user to select the number of days to search the AIX error log for errors when running the Error Log Analysis. The default is seven days, but can be changed from one to sixty days.

- Display Progress Indicators

This option allows the user to turn on or off the progress indicators when running the Diagnostic Applications. The progress indicators are a popup box at the bottom of the screen indicating the test being run (the default is on).

- Save Changes to the Database

This option allows the user to save any changes made to the run-time options. Without saving the changes, any changes made are only applicable to that session of diagnostics (the default is no).

Display Previous Diagnostic Results

Note: This service aid is only available when you load the diagnostics from a disk drive or a network. However, on a CHRP system, this service aid is available when you run the diagnostics in stand-alone mode because the results are stored in the NVRAM.

Each time the diagnostics produce a service request number (SRN) to report a problem, information about that problem is logged. The service representative can look at this log to see which SRNs are recorded. This log also records the results of diagnostic tests that are run in loop mode.

When this service aid is selected, information on the last problem logged is displayed. The arrow keys can be used to look at information about previous problems.

This information *is not* from the error log maintained by the AIX operating system.

The ASCII version of the Diagnostics Log is available in the **`/etc/lpp/diagnostics/data/*.dat`** files.

Display Resource Attributes

This task displays the Customized Device Attributes associated with a selected resource. This task is similar to running the **`lsattr -E -l <resource>`** command.

Display Service Hints

This service aid reads and displays the information in the CEREADME file from the diagnostics media. This file contains information that is not in the publications for this version of the diagnostics. It also contains information about using this particular version of diagnostics.

Use the arrow keys to scroll through the information in the file.

Display Software Product Data

This task invokes SMIT to display information about the installed software and provides the following functions:

- List Installed Software
 - List Applied but Not Committed Software Updates
 - Show Software Installation History
 - Show Fix (APAR) Installation Status
 - List Fileset Requisites
 - List Fileset Dependents
 - List Files Included in a Fileset
 - List File Owner by Fileset
-

Display System Environmental Sensors

This service aid displays the environmental sensors implemented on a CHRP system. The information displayed is the sensor name, physical location code, literal value of the sensor status, and the literal value of the sensor reading.

The sensor status can be any one of the following:

- **Normal** – The sensor reading is within the normal operating range.
- **Critical High** – The sensor reading indicates a serious problem with the device. Run diagnostics on sysplanar0 to determine what repair action is needed.
- **Critical Low** – The sensor reading indicates a serious problem with the device. Run diagnostics on sysplanar0 to determine what repair action is needed.

- **Warning High** – The sensor reading indicates a problem with the device. This could become a critical problem if action is not taken. Run diagnostics on `sysplanar0` to determine what repair action is needed.
- **Warning Low** – The sensor reading indicates a problem with the device. This could become a critical problem if action is not taken. Run diagnostics on `sysplanar0` to determine what repair action is needed.
- **Hardware Error** - The sensor could not be read because of a hardware error. Run diagnostics on `sysplanar0` in problem determination mode to determine what repair action is needed.
- **Hardware Busy** – The system has repeatedly returned a busy indication, and a reading is not available. Try the service aid again. If the problem continues, run diagnostics, on `sysplanar0` in problem determination mode to determine what repair action is needed.

This service aid can also be run as a command. The command can be used to list the sensors and their values in a text format, list the sensors and their values in numerical format, or a specific sensor can be queried to return either the sensor status or sensor value.

The command can be run by entering one of the following:

```
/usr/lpp/diagnostics/bin/uesensor -l | -a
/usr/lpp/diagnostics/bin/uesensor -t <token> -i <index> [-v]
```

Flag	Description
-l	List the sensors and their values in a text format.
-a	List the sensors and their values in a numerical format. For each sensor, the following numerical values are displayed as: <token> <index> <status> <measured value> <location code>
-t token	Specifies the sensor token to query.
-i index	Specifies the sensor index to query.
-v	Indicates to return the sensor measured value. The sensor status is returned by default.

Examples

1. Display a list of the environmental sensors:

```
/usr/lpp/diagnostics/bin/uesensor -l
Sensor = Fan Speed
Status = Normal
Value = 2436 RPM
Location Code = F1
```

Sensor = Power Supply
Status = Normal
Value = Present and operational
Location Code = V1

Sensor = Power Supply
*Status = Critical low
Value = Present and not operational
Location Code = V2

2. Display a list of the environmental sensors in a numerical list:

```
/usr/lpp/diagnostics/bin/uesensor -a
```

```
3 0 11 87 P1  
9001 0 11 2345 F1  
9004 0 11 2 V1  
9004 1 9 2 V2
```

3. Return the status of sensor 9004, index 1:

```
/usr/lpp/diagnostics/bin/uesensor -t 9004 -i 1
```

```
9
```

4. Return the value of sensor 9004, index 1:

```
/usr/lpp/diagnostics/bin/uesensor -t 9004 -i 1 -v
```

```
2
```

Display Test Patterns

This service aid provides a means of adjusting system display units by providing display-able test patterns. Through a series of menus the user selects the display type and test pattern. After the selections are made the test pattern is displayed.

Download Microcode

This service aid provides a way to copy microcode to an adapter or device. The service aid presents a list of adapters and devices that use microcode. After the adapter or device is selected, the service aid provides menus to guide you in checking the current level and downloading the needed microcode.

This task may be run directly from the AIX command line. The following usage statements guide you for a particular type of adapter or device. See the flag descriptions to complete the AIX command.

Download Microcode to PCI SCSI RAID Adapter

The following usage statements describe the syntax of the command for a PCI SCSI RAID Adapter:

Usage:

```
diag -c -d <RAID adapterName> -T "download [-B] [-D] [-P]"
```

Flag	Description
-B	Download boot block microcode (default to functional microcode).
-D	Microcode is on diskette (default to /etc/microcode directory).
-P	Download the previous level of microcode (default to latest level).

Download Microcode to Disk Drive Attached to a PCI SCSI RAID Adapter

The following usage statements describe the syntax of the command for a disk drive attached to a PCI SCSI RAID Adapter.

Usage:

```
diag -c -d <RAID adapterName> -T "download {-l <chID> | -A} [-D] [-P]"
```

Flag	Description
-A	All disk drives.
-D	Microcode is on diskette (default to /etc/microcode directory).
-l	RAID disk drive—physical disk channel/ID (example 27).
-P	Download the previous level of microcode (default to latest level).

Download Microcode to a PCI FC-AL Adapter

The following usage statements describe the syntax of the command for a PCI FC-AL Adapter.

Usage:

```
diag -c -d <device_name> -T "download [-s {diskette|disk}]  
[-f <file_name>]"
```

Flag	Description
-d	System name for the adapter or device (example fcs0).
-f	File name on the source device. (Disk source must have complete path from root directory.)
-s	microcode source. /etc/microcode is default. Default source device is disk.

Download Microcode to Other Devices

The following usage statements describe the syntax of the command:

Usage:

```
diag -c -d <device_name> -T "download [-s diskette] [-l previous] [-F]"
```

Flag	Description
-F	Force flag. Required to download microcode if the current level is unavailable on the source.
-l	Microcode level. Latest is default.
-s	microcode source. /etc/microcode is default. Default source device is disk.

Fibre Channel RAID Service Aids

The Fibre Channel RAID service aids contain the following functions:

Certify LUN

This selection reads and checks each block of data in the LUN. If excessive errors are encountered the user is notified.

You can run this task from the AIX command line. The following usage statement describes the syntax of the fastpath command:

Usage: `diag -T "certify"`

Certify Spare Physical Disk

This selection allows the user to certify (check integrity of the data) on drives designated as spares.

You can run this task from the AIX command line. The following usage statement describes the syntax of the fastpath command:

Usage: `diag -T "certify"`

Format Physical Disk

This selection is used to format a selected disk drive.

You can run this task from the AIX command line. The following usage statement describes the syntax of the fastpath command:

Usage: `diag -T "format"`

Array Controller Microcode Download

This selection allows the microcode on the Fibre Channel RAID controller to be updated when required.

You can run this task from the AIX command line. The following usage statement describes the syntax of the fastpath command:

Usage: `diag -T "download"`

Physical Disk Microcode Download

This selection is used to update the microcode on any of the disk drives in the array.

You can run this task from the AIX command line. The following usage statement describes the syntax of the fastpath command:

Usage: `diag -T "download"`

Update EEPROM

This selection is used to update the contents of the EEPROM on a selected controller.

Replace Controller

Use this selection when it is necessary to replace a controller in the array.

Flash SK-NET FDDI Firmware

This task allows the Flash firmware on the SysKconnect SK-NET FDDI adapter to be updated.

Format Media

This task allows the selection of diskettes, hardfiles, or optical media to be formatted. Each selection is described below.

Hardfile Attached to SCSI Adapter (non-RAID)

- Hardfile Format

Writes all of the disk. The pattern put on the disk is device dependent, i.e. some drives may put all 0s, while some may put hexadecimal number 5F. No bad block reassignment occurs.

- Hardfile Format and Certify

Does the same function as Format. After the format is completed, Certify is run. This certify reassigns all bad blocks encountered.

- Hardfile Erase Disk

This option can be used to overwrite (remove) all data currently stored in user-accessible blocks of the disk. The Erase Disk option writes one or more patterns to the disk. An additional option allows data in a selectable block to be read and displayed on the system console.

To use the Erase Disk option, specify the number (0-3) of patterns to be written. Select the patterns to be written; the patterns are written serially. That is, the first pattern is written to all blocks. Then the next pattern is written to all blocks, overlaying the previous pattern. A random pattern is written by selecting the "Write random pattern?" option.

Note: The Erase Disk service aid has not been certified as meeting the Department of Defense or any other organizations security guidelines.

The following steps should be followed if the data on the drive is to be overwritten:

1. Use the "Erase Disk" selection to overwrite the data on the drive.
2. Do a format without certify.
3. Run a second pass of the erase disk selection.

For a newly installed drive, you can insure that all blocks on the drive are overwritten with your pattern if you use the following procedure:

1. Format the drive.
2. Check the defect MAP by running the Erase Disk selection.

Note: If you use the "Format and Certify" option, there may be some blocks which get placed into the grown defect MAP.

3. If there are bad blocks in the defect MAP, record the information presented and ensure that this information is kept with the drive. This data is used later when the drive is to be overwritten.
4. Use the drive as you would normally.

5. When the drive is no longer needed and is to be erased, run the same version of the Erase Disk selection which was used in step 2.

Note: Using the same version of the service aid is only critical if there were any bad blocks found in step 3.

6. Compare the bad blocks which were recorded with the drive in step 3 with those which now appear in the grown defect MAP.

Note: If there are differences between the saved data and the newly obtained data, then all sectors on this drive cannot be overwritten. The new bad blocks are not overwritten.

7. If the bad block list is the same, continue running the service aid to overwrite the disk with the chosen pattern(s).

This task may be run directly from the AIX command line. The following usage statement describes the syntax of the command:

Usage:

```
diag -c -d <deviceName> -T "format [-s* fmtcert | erase -a {read | write}] [-F]"
```

Flag	Description
fmtcert	Formats and certifies the disk.
*	Available in no-console mode only.
-F	Force flag. Forces disk erasure even if all blocks cannot be erased due to errors accessing grown defect map.

Note: Erase option in command line mode uses default values. To selectively read or write, use diag in console mode.

Hardfile Attached to PCI SCSI RAID Adapter

This function formats the physical disks attached to a PCI SCSI RAID adapter. This task may be run directly from the AIX command line. The following usage statement describes the syntax of the command:

Usage:

```
diag -c -d <RAID adapterName> -T "format {-l <chId> | -A }"
```

Flag	Description
-l	Physical disk channel/ID - (An example of physical disk channel/ID is 27, where the channel is 2 and the ID is 7.)
-A	All disks

Optical Media

- Optical Media Initialize

Formats the media without certifying. This function does not reassign the defective blocks or erase the data on the media. It provides a quick way of formatting the media and cleaning the disk.

Note: It takes approximately 1 minute to format the media.

- Optical Media Format and Certify

Formats and certifies the media. This function reassigns the defective blocks and erases all data on the media.

This task may be run directly from the AIX command line. The following usage statement describes the syntax of the command:

Usage:

```
diag -c -d <deviceName> -T "format [-s {initialize | fmtcert} ]"
```

Option	Description
initialize	Formats media without certifying.
fmtcert	formats and certifies the media.

Diskette Format

This selection formats a diskette by writing patterns to it.

Generic Microcode Download

This service aid provides a means of executing a "generic" script from a diskette. The intended purpose for this "generic" script is to load microcode to a supported resource. This script is responsible for executing whatever program is required in order to download the microcode onto the adapter or device.

This service aid is supported in both concurrent and stand-alone modes from disk, LAN, or loadable media.

On entry, the service aid displays information about what it does. It then asks for a Genucode diskette to be inserted into the diskette drive. The diskette must be in tar format. The service aid then restores the script file **genucode** to the **/tmp** directory. Then the script is executed. The script must at that point then pull off any other needed files from the diskette. The script should then exec whatever program is necessary in order to perform its function. On completion, a status code is returned, and the user is returned to the service aid. The **genucode** script should have a `# ! /usr/bin/ksh` line at the beginning of the file. Return status of 0 should be returned if the program was successful, else a non-zero status should be returned.

Local Area Network Analyzer

This selection is used to exercise the LAN communications adapters (Token-Ring, Ethernet, and (FDDI) Fiber Distributed Data Interface). The following services are available:

- Connectivity testing between two network stations. Data is transferred between the two stations. This requires the user to input the Internet Addresses of both stations.
- Monitoring ring (Token-Ring only). The ring is monitored for a period of time. Soft and hard errors are analyzed.

Periodic Diagnostics

This selection provides a tool for configuring periodic diagnostics and automatic error log analysis. A hardware resource can be chosen to be tested once a day, at a user specified time. If the resource cannot be tested because it is busy, error log analysis is performed. Hardware errors logged against a resource can also be monitored by

enabling Automatic Error Log Analysis. This allows error log analysis to be performed every time a hardware error is put into the error log. If a problem is detected, a message is posted to the system console and a mail message sent to the user(s) belonging to the system group with information about the failure such as Service Request Number.

The service aid provides the following functions:

- Add or delete a resource to the periodic test list
- Modify the time to test a resource
- Display the periodic test list
- Modify the error notification mailing list
- Disable or Enable Automatic Error Log Analysis

PCI RAID Physical Disk Identify

This selection identifies physical disks connected to a PCI SCSI-2 F/W RAID adapter.

This task may be run directly from the AIX command line. The following usage statement describes the syntax of the command:

Usage

```
diag -c -d < pci RAID adapter > -T identify
```

Process Supplemental Media

Diagnostic Supplemental Media contains all the necessary diagnostic programs and files required to test a particular resource. The supplemental is normally released and shipped with the resource as indicated on the diskette label. Diagnostic Supplemental Media must be used when the device support has not been incorporated into the latest diagnostic CD-ROM.

This task processes the Diagnostic Supplemental Media. Insert the supplemental media when prompted, then press Enter. After processing has occurred, go to the Resource Selection list to find the resource to test.

Notes:

- This task is supported in Stand-alone Diagnostics only.
 - Process and test one resource at a time.
 - Do not process multiple supplementals at a time.
-

Run Diagnostics

The Run Diagnostics task invokes the Resource Selection List menu. When the commit key is pressed, Diagnostics are run on all selected resources.

The procedures for running the diagnostics depends on the state of the diagnostics run time options. See “Display or Change Diagnostic Run Time Options” on page 6-17.

Run Error Log Analysis

The Run Error Log Analysis task invokes the Resource Selection List menu. When the commit key is pressed, Error Log Analysis is run on all selected resources.

Run Exercisers

This task provides a tool to troubleshoot intermittent system problems on AIX Release 4.3.2 or later. This task provides an exerciser supervisor that controls the selected exercisers.

When you select Run Exercisers from the Task Selection menu, the EXERCISER SELECTION menu displays. Select the exerciser you want to run from this menu. Each exerciser has other menus to set options for the exerciser.

Exerciser Commands (CMD)

Use the following commands as needed in the exerciser menus and reports. Not all commands are available in each menu or report.

CMD	Description
a	Acknowledge an error.
b	Back one page.
c	Toggle between cycle count and last error.

e	View the AIX error log.
f	Page forward one page.
q	Return to Main Menu.
r	Refresh screen.
s	Enable or disable beep on error.
x	Exit system exerciser.

Acronyms

The following list describes acronyms used in the exerciser reports.

To toggle between two states (example Activate/Halt Devices), use the number of the device.

Acronym Description

COE	Continue on error (use number to select).
CP	Device has run the specified number of cycles and is not running.
DD	The exerciser has been terminated by a signal.
ER	Device has stopped with an error.
HG	The device is hung.
HOE	Halt on error (use number to select).
RN	Device is running.
ST	Device is stopped.

Memory Exerciser

The memory exercisers are labeled memx, where x is a number for the exerciser. Multiple exercisers can be active.

The memory exerciser requests as many memory buffers as possible from AIX. The exerciser then fills the memory buffers with specified bit patterns, then reads and compares the memory buffers to the specified bit patterns.

On systems with multiple processors a process is started for each processor. The free memory space is split evenly between the available processors thus reducing the time required to exercise all of the memory.

If the system is working properly, there are no compare errors. If a non-recoverable memory error occurs, the system crashes. Recoverable memory errors are logged by the AIX operating system.

The following items must be available to run this service aid:

- On-line diagnostics loaded in maintenance mode
- 128KB of free space in **/etc/lpp/diagnostics/data**

- The following commands must be available:
 - **vmstat**
 - **lsps**
 - **bootinfo**
-

Save or Restore Hardware Management Policies

Use this service aid to save or restore the settings from Ring Indicate Power On Policy, Surveillance Policy, Remote Maintenance Policy and Reboot Policy.

- Save Hardware Management Policies

This selection writes all of the settings for the hardware management policies to the file:

```
/etc/lpp/diagnostics/data/hmpolicies
```

- Restore Hardware Management Policies

This selection restores all of the settings for the hardware management policies from the contents of the file:

```
/etc/lpp/diagnostics/data/hmpolicies
```

This service aid may be accessed directly from the AIX command line, by entering:

```
/usr/lpp/diagnostics/bin/uspchrp -a
```

Save or Restore Service Processor Configuration

Note: Runs on RSPC system units only.

Use this service aid to save or restore the Service Processor Configuration to or from a file. The Service Processor Configuration includes the Ring Indicator Power On Configuration.

- Save Service Processor Configuration

This selection writes all of the settings for the Ring Indicate Power On and the Service Processor to the file:

```
/etc/lpp/diagnostics/data/spconfig
```

- Restore Service Processor Configuration

This selection restores all of the settings for the Ring Indicate Power On and the Service Processor from the file:

SCSI Bus Analyzer

This service aid provides a means to diagnose a SCSI Bus problem in a free-lance mode.

To use this service aid, the user should have an understanding of how a SCSI Bus works. This service aid should be used when the diagnostics cannot communicate with anything on the SCSI Bus and cannot isolate the problem. Normally the procedure for finding a problem on the SCSI Bus with this service aid is to start with a single device attached, ensure that it is working, then start adding additional devices and cables to the bus ensuring that each one works. This service aid works with any valid SCSI Bus configuration.

The SCSI Bus Service Aid transmits a SCSI Inquiry command to a selectable SCSI Address. The service aid then waits for a response. If no response is received within a defined amount of time, the service aid displays a timeout message. If an error occurs or a response is received, the service aid then displays one of the following messages:

- The service aid transmitted a SCSI Inquiry Command and received a valid response back without any errors being detected.
- The service aid transmitted a SCSI Inquiry Command and did not receive any response or error status back.
- The service aid transmitted a SCSI Inquiry Command and the adapter indicated a SCSI bus error.
- The service aid transmitted a SCSI Inquiry Command and an adapter error occurred.
- The service aid transmitted a SCSI Inquiry Command and a check condition occur.

When the SCSI Bus Service Aid is entered a description of the service aid is displayed.

Pressing the Enter key displays the Adapter Selection menu. This menu allows the user to enter which address to transmit the SCSI Inquiry Command.

When the adapter is selected the SCSI Bus Address Selection menu is displayed. This menu allows the user to enter which address to transmit the SCSI Inquiry Command.

Once the address is selected the SCSI Bus Test Run menu is displayed. This menu allows the user to transmit the SCSI Inquiry Command by pressing the Enter key. The service aid then indicates the status of the transmission. When the transmission is completed, the results of the transmission are displayed.

Notes:

- A Check Condition can be returned when there is nothing wrong with the bus or device.
- AIX does not allow the command to be sent if the device is in use by another process.

SCSI Device Identification and Removal

This service aid allows the user to choose a SCSI device or location from a menu and to identify a device located in a system unit that uses a SCSI Enclosure Services (SES) backplane.

The service aid also does the following:

- Generates a menu displaying all SCSI devices.
- Lists the device and all of its sibling devices.
- List all SCSI adapters and their ports.
- List all SCSI devices on a port.

SCSD Tape Drive Service Aid

This service aid provides a means to obtain the status or maintenance information from a SCSD tape drive. Only some models of SCSI tape drive are supported.

The service aid provides the following options:

- Display time since a tape drive was last cleaned.

The time since the drive was last cleaned is displayed onto the screen. In addition, a message whether the drive is recommended to be cleaned is also displayed.

- Copy a tape drive's trace table.

The trace table of the tape drive is written to diskettes or a file. The diskettes must be formatted for DOS. Writing the trace table may require several diskettes.

The actual number of diskettes is determined by the size of the trace table. Label the diskettes as follows:

'TRACE[x].DAT' (where 'x' is a sequential diskette number). The complete trace table consists of the sequential concatenation of all the diskette data files.

When the trace table is written to a disk file, the service aid prompts for a file name. The default name is: '/tmp/TRACE.<x>', where x is the AIX name of the SCSD tape drive being tested.

- Display or copy a tape drive's log sense information.

The service aid provides options to display the log sense information to the screen, to copy it to a DOS formatted diskette or to copy it to a file. The file name "LOGSENSE.DAT" is used when the log sense data is written on the diskette. The service aid prompts for a file name when the log sense data is chosen to be copied to a file.

This service aid may be run directly from the AIX command line. The following usage statement describes the syntax of the command (path is /usr/lpp/diagnostics/bin/utape):

Usage:

```
utape [-h | -?] [-d <device>] [-n | -l | -t]
```

or

```
utape -c -d <device> [-v] {-n | {-l | -t} { -D | -f [<filename>]}}
```

Flag	Description
-------------	--------------------

-c	Run the service aid without displaying menus. The return code indicates success or failure. The output is suppressed except for the usage statement and the numeric value for hours since cleaned (if -n and -D flags are used).
-D	Copy data to diskette.
-f	Copy data to the filename given after this flag or to a default filename if no name is specified.
-h, -?	Display a usage statement and/or return code. If the -c flag is present, only the return code displays to indicate the service aid did not run. If the -c isn't used, a usage statement displays and the service aid exits.
-l	Display or copy log sense information.
-n	Display time since drive was last cleaned.
-t	Copy trace table.

- v Verbose mode. If the -c flag is present, the information displays on the screen. If the -n flag is present, the information about tape head cleaning is printed.
-

Spare Sector Availability

This selection checks the number of spare sectors available on the optical disk. The spare sectors are used to reassign when defective sectors are encountered during normal usage or during a format and certify operation. Low availability of spare sectors shows that the disk needs to be backed up and replaced. Formatting the disk does not improve the availability of spare sectors.

This task may be run directly from the AIX command line. The following usage statement describes the syntax of the command:

Usage:

```
diag -c -d < deviceName > -T chkspares
```

SSA Service Aids

This service aid provides tools for diagnosing and resolving problems on SSA attached devices. The following tools are provided:

- Set Service Mode
 - Link Verification
 - Configuration Verification
 - Format and Certify Disk
-

Update Disk Based Diagnostics

This service aid allows fixes (APARs) to be applied.

This task invokes the SMIT Update Software by Fix (APAR) task. The task allows the input device and APARs to be selected. Any APAR can be installed using this task.

Update System or Service Processor Flash

This selection updates the system or service processor flash for CHRP system units.

Further update and recovery instructions may be provided with the update. It is necessary to know the fully qualified path and file name of the flash update image file that was provided. If the flash update image file is on a diskette, the service aid can list the files on the diskette for selection.

Refer to the update instructions, or the system unit's service guide to determine the level of the system unit or service processor flash.

When run from online diagnostics, the flash update image file is copied to the **/var** file system. If there is not enough space in the **/var** file system for the flash update image file, an error is reported. If this occurs, exit the service aid, increase the size of the **/var** file system and retry the service aid. After the file is copied, a warning screen asks for confirmation to continue the update flash. Continuing the update flash reboots the system. The system does not return to diagnostics. The current flash image is not saved. After the reboot, the **/var/update_flash_image** can be removed.

When running from stand-alone diagnostics, the flash update image file is copied to the file system from diskette. The user needs to provide the image on a diskette since the user does not have access to remote file systems or any other files that are on the system. If enough space is not available, an error is reported stating additional system memory is needed. After the file is copied, a warning screen asks for confirmation to continue the update flash. Continuing the update flash reboots the system. The current flash image is not saved.

The **update_flash** command can be used in place of this service aid. It is located in the **/usr/lpp/diagnostics/bin** directory.

Attention: The **update_flash** command reboots the entire system. Do not use this command if more than one user is signed onto the system.

Update System Flash

Note: Runs on RSPC system units only.

This selection updates the system flash for RSPC systems.

The user provides a valid binary image either on diskette or qualified path name. The diskettes can be in DOS or a backup format.

The flash update image is copied to the **/var** file system. If there is not enough space in the file system for the flash update image file, an error is reported. If this occurs, increase the file size of the **/var** file system. The current flash image is not saved. The command automatically removes the **/var/update_flash_image**.

After user confirmation, the command reboots the system twice to complete the flash update.

7135 RAIDiant Array Service Aid

The 7135 RAIDiant Array service aids contain the following functions:

- Certify LUN
This selection reads and checks each block of data in the LUN. If excessive errors are encountered the user is notified.
- Certify Spare Physical Disk
This selection allows the user to certify (check the integrity of the data) on drives designated as spares.
- Format Physical Disk
This selection is used to format a selected disk drive.
- Array Controller Microcode Download
This selection allows the microcode on the 7135 controller to be updated when required.
- Physical Disk Microcode Download
This selection is used to update the microcode on any of the disk drives in the array.
- Update EEPROM
This selection is used to update the contents of the EEPROM on a selected controller.
- Replace Controller
Use this selection when it is necessary to replace a controller in the array.

Adapter Microcode Download

Usage: `diag -c -d <deviceName> -T "download [-B] [-D] [-P]"`

Flag	Description
-B	Download boot block microcode (default to functional microcode)
-D	Microcode is on diskette (default to /etc/microcode directory)
-P	Download the previous level of microcode (default to latest level)

Physical Disk Microcode Download

Usage: `diag -c -d <deviceName> -T "download -l <ChId> [-D] [-P]"`

Flag	Description
-l	Physical disk channel/ID (i.e. 27)
-D	Microcode is on diskette (default to /etc/microcode directory)
-P	Download the previous level of microcode (default to latest level)

Physical Disk Format

Usage: `diag -c -d <deviceName> -T "format -l <ChId>"`

Flag	Description
-l	Physical disk channel/ID (i.e. 27)

Physical Disk Certify

Usage: `diag -c -d <deviceName> -T "certify -l <ChId>"`

Flag	Description
-l	Physical disk channel/ID (i.e. 23)

Physical Disk Identify

Usage: `diag -c -d <deviceName> -T "identify"`

7318 Serial Communications Network Server Service Aid

This service aid provides a tool for diagnosing terminal server problems.

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” on page 8-1.

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.
 - 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 Stand-alone 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 Stand-alone and Online Diagnostics” on page 5-1.
 - 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 Stand-alone 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 Appendix B, “General Attributes Required When Using a TTY Terminal” on page B-1.
 - Return to substep 5 when you finish checking the attributes.
5. Turn the power on.
 - a. When the keyboard indicator appears, press F5 on the direct attached keyboard (5 on the ASCII keyboard) to load the Stand-alone Diagnostics or F6 on the directly-attached keyboard (6 on the ASCII terminal 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 8-10.

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

Problem Determination Using the Stand-alone or Online Diagnostics

Use this procedure to obtain a service request number (SRN) when you are able to load the Stand-alone or Online Diagnostics. If you are unable to load the Stand-alone or Online Diagnostics, go to “Problem Determination When Unable to Load Diagnostics” on page 8-10. 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 a 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 Chapter 5, “Using the Stand-alone and Online Diagnostics” on page 5-1.
 - ISA adapters cannot be detected by the system. The ISA adapter Configuration Service Aid allows the identification and configuration of ISA adapters for Stand-alone Diagnostics. ISA adapters must be identified and configured before they can be tested.
 - Go to “Step 2.”
-

Step 2

Are the Online Diagnostics installed on this system?

NO Go to “Step 15” on page 8-8.

YES Go to “Step 3” on page 8-2.

Step 3

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 administration and users that the system may be turned off. If so, then turn off the system unit and go to “Step 6” on page 8-3.

YES Go to “Step 4.”

Step 4

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 5” on page 8-3.

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.
2. After the operating system is stopped, power off the system unit.
3. Go to “Step 6” on page 8-3.

Step 5

This step invokes the Online Diagnostics in concurrent mode.

1. Log on as **root** or as **superuser**.
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.
2. After the operating system is stopped, power off the system unit.
3. Go to “Step 6.”

YES Go to “Step 9” on page 8-4.

Step 6

This step loads Online Diagnostics in service mode. If you are unable to load the diagnostics, go to “Step 7” on page 8-4.

1. Turn the power on.
2. When the keyboard indicator (icon or text) appears, press F6 on the directly-attached keyboard or 6 on the ASCII terminal 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 7” on page 8-4.

YES Go to “Step 9” on page 8-4.

Step 7

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 8."
All other symptoms.	Go to "Problem Determination When Unable to Load Diagnostics" on page 8-10

Step 8

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 9

The diagnostics loaded correctly.

Press the Enter key.

Is the Function Selection menu displayed?

NO Go to "Step 10" on page 8-5.

YES Go to "Step 11" on page 8-6.

Step 10

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 11

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 12" on page 8-7.
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 12" on page 8-7. If you get an SRN, record it, and go to "Step 14" on page 8-8.
The New Resource menu is displayed.	Follow the displayed instructions. Note: Devices attached to serial ports S1 or S2 do 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 12" on page 8-7. If you get an SRN, record it, and go to "Step 14" on page 8-8. If you do not get an SRN, go to "Step 17" on page 8-9.
The system does not respond to selecting diagnostics	Go to "Step 10" on page 8-5.

Step 12

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 13.”
- If an SRN is displayed, record it, and go to “Step 14” on page 8-8.
- YES** Go to “Step 13.”
-

Step 13

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

Note: ISA adapters cannot be detected by the system. The ISA adapter Configuration Service Aid allows the identification and configuration of ISA adapters for Stand-alone Diagnostics. ISA adapters must be identified and configured before they can be tested.

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 14” on page 8-8.
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 17” on page 8-9.

Step 14

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 15

When you are loading the Stand-alone 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 Stand-alone Diagnostics and run them from a ASCII terminal?

NO Go to "Step 16" on page 8-9.

YES Go to "Running the Diagnostics from a tty Terminal" on page 5-3. and be sure your terminal attributes are set to work with the diagnostic programs.

Return to "Step 16" on page 8-9 when you finish checking the attributes. Record any settings that are changed.

Step 16

This step loads the Stand-alone Diagnostics. If you are unable to load the diagnostics, go to “Step 7” on page 8-4.

1. Turn the power on.
2. Insert the diagnostic CD-ROM into the CD-ROM drive.
3. When the keyboard indicator appears, press F5 on the direct attached keyboard or 5 on the ASCII 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 7” on page 8-4.

YES Go to “Step 9” on page 8-4.

Step 17

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 a 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” on page 8-11.

YES Go to “Step 3” on page 8-11.

Step 3

This step attempts to load Online Diagnostics in service mode.

1. Turn the power to off.
2. Turn the power on.
3. If the keyboard indicator appears, press F6 on the direct attached keyboard or 6 on the ASCII 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" on page 8-12.

YES Go to "Step 6" on page 8-15.

Step 4

This step attempts to load the Stand-alone diagnostics.

1. Turn the power to off.
2. Turn the power to on.
3. Insert the diagnostic CD-ROM into the CD-ROM drive.
4. If the keyboard indicator appears, press F5 on the direct attached keyboard or 5 on the ASCII 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" on page 8-12.

YES Go to "Step 6" on page 8-15.

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" on page 8-15.
The diskette LED is blinking rapidly, or E1EA or E1EB is displayed on the operator panel.	The flash EPROM data is corrupted. The recovery procedure for the flash EPROM should be executed.
The system stops with a prompt to enter a password.	Enter the password. You are not be 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.

Symptom	Action
The system login prompt is displayed.	<p>You may not have pressed the correct key or you may not have pressed the key soon enough when you were to indicate a Service Mode boot of diagnostic programs. If this was the case, start over at the beginning of this step.</p> <p>If you are sure you pressed the correct key in a timely manner go to Step 7.</p>
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.	<p>If the indicator (text or icon) represents:</p> <ul style="list-style-type: none"> • A keyboard, record error code M0KBD000 and report the problem to the service organization. • Memory, record error code MOMEM002 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.

Symptom	Action
<p>The System Management Services menu is displayed.</p>	<p>The device or media you are attempting to boot from may be faulty.</p> <ol style="list-style-type: none"> 1. Check the SMS error log for any errors. To check the error log: <ul style="list-style-type: none"> • Choose tools • Choose 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 person. • 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 Stand-alone Diagnostics. Otherwise, record error code M0SCSI01 and report to the service organization.
<p>The system appears to be stopped, the disk activity light is on continuously, and a beep was heard from the system unit.</p>	<p>Record error code M0MEM001 and report the problem to the service organization.</p>
<p>The system stops and the message "STARTING SOFTWARE PLEASE WAIT ..." is displayed.</p>	<p>Report error code M0BT0000.</p>
<p>The message "The system will now continue the boot process" is displayed continuously on the system unit's console.</p>	<p>Report error code M0SCSI01.</p>

Step 6

The diagnostics loaded correctly.

Go to “Problem Determination Using the Stand-alone 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.

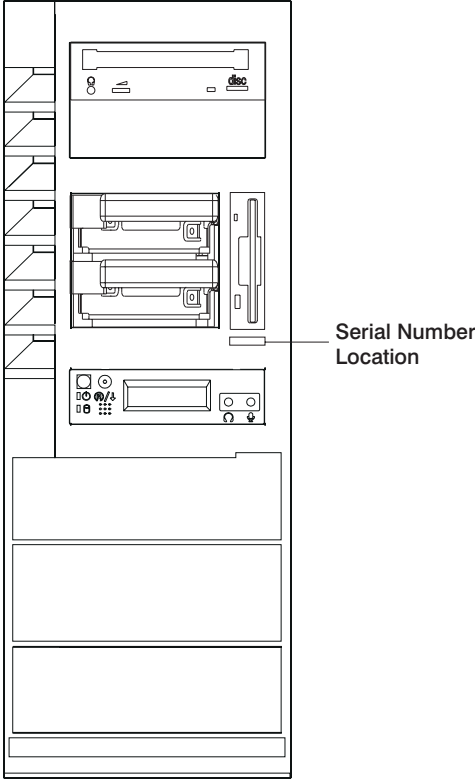
Appendix A. System Records

Record the Identification Numbers

Record and retain the following information.

Product Name	7043 Model 260
CPU Type/Speed	_____
Serial Number	_____
Key Serial Number	_____

The system unit's identification numbers are located on the front cover as shown in the figure below



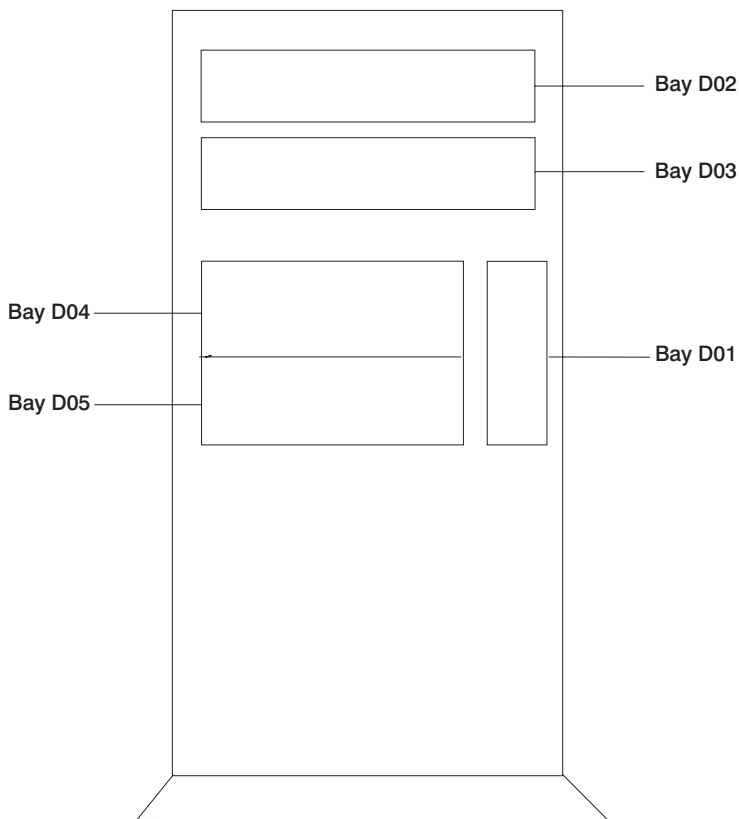
Device Records

Use the following tables to keep a record of the options installed in or attached to your system. This information can be helpful when you install additional options in your system or if you ever need to have your system serviced.

Table A-1. Internal and External Options

Location	Option Description
Memory Slot J2	
Memory (J1/J2)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J3/J4)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J5/J6)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J7/J8)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J9/J10)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J11/J12)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J13/J14)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J15/J16)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory Slot J3	
Memory (J1/J2)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J3/J4)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J5/J6)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J7/J8)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J9/J10)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J11/J12)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J13/J14)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J15/J16)	<u>32MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Mouse Connector	<u>IBM Mouse</u> <input type="checkbox"/> Other: _____
Keyboard Connector	<u>Space Saving</u> <input type="checkbox"/> <u>Enhanced</u> <input type="checkbox"/> Other: _____
Expansion Slot 5	_____
Expansion Slot 4	_____
Expansion Slot 3	_____
Expansion Slot 2	_____
Expansion Slot 1	_____
Parallel Port	_____
Serial Port 1	_____
Serial Port 2	_____

Refer to the following diagram of your server's bays when completing Table A-2 on page A-4.



Notes:

- If you attach a drive or other device to an adapter, record the expansion-slot number for that adapter in the adapter field of table A-2.
- Your model might have more preinstalled drives than shown in this table.

Table A-2. Internal Files and Devices

Adapter	Location	SCSI ID	Drive Description
Integrated	Bay D01	Non-SCSI	<u>3.5-Inch 1.44MB Diskette Drive</u>
Integrated	Bay D02	1	<u>CD-ROM Drive</u>
Integrated	Bay D03	0	<u>Media Drive</u>
Integrated	Bay D04	9	<u>Disk Drive</u>
Integrated	Bay D05	8	<u>Disk Drive</u>
_____	_____	_____	_____
_____	_____	_____	_____

Appendix B. General Attributes Required When Using a TTY Terminal

The following general attributes are the default settings for the diagnostic programs. Be sure your terminal is set to these attributes.

Note: These attributes should be set before the diagnostic programs are loaded.

Refer to the following table.

General Setup Attributes	3151 /11/31/41 Settings	3151 /51/61 Settings	3161 /3164 Settings	Description
Machine mode	3151	3151 PC	3161 or 3164	The diagnostic programs are set to emulate use of the 3161 ASCII Display Terminal. If your terminal can emulate a 5085, 3161 or 3164 terminal, use the following attribute settings. Otherwise, refer to your operator's manual, compare the follow attribute descriptions with those of your terminal, and set your attributes accordingly.
Generated Code Set		ASCII		
Screen	Normal	Normal		Uses the EIA-232 interface protocol.
Row and Column	24 x 80	24 x 80		Uses the EIA-232 interface protocol.
Scroll	Jump	Jump	Jump	When the last character on the bottom line is entered, the screen moves down one line.
Auto LF	Off	Off	Off	For the "On" setting, pressing the Return key moves the cursor to the first character position of the next line. For the "Off" setting, pressing the Return key moves the cursor to the first character position of the current line. The CR and LF characters are generated by the New line setting.
CRT saver	Off	Off	10	The "10" setting causes the display screen to go blank if there is no activity for 10 minutes. When the system unit sends data or a key is pressed, the screen contents are displayed again.

General Setup Attributes	3151 /11/31/41 Settings	3151 /51/61 Settings	3161 /3164 Settings	Description
Line wrap	On	On	On	The cursor moves to the first character position of the next line in the page after it reaches the last character position of the current line in the page.
Forcing insert	Off	Off		
Tab	Field	Field	Field	The column tab stops are ignored, and the tab operation depends on the field attribute character positions.
Trace			All	Both inbound data (data to the system unit) and outbound data (data from the system unit) to and from the main port can be transferred to the auxiliary port without disturbing communications with the system unit when the Trace key is pressed.

Additional Communication Attributes

The following communication attributes are for the 3151, 3161, and 3164 terminals.

Communication Setup Attributes	3151/11 /31/41 Settings	3151 /51/61, Settings	3161 /3164 Settings	Description
Operating mode	Echo	Echo	Echo	Data entered from the keyboard on the terminal is sent to the system unit for translation and then sent back to the display screen. Sometimes called conversational mode.
Line speed	9600 bps	9600 bps	9600 bps	Uses the 9600 bps (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects eight bits as a data word length (byte).
Parity	No	No	No	Does not add a parity bit, and is used together with the word length attribute to form the 8-bit data word (byte).
Stop bit	1	1	1	Places a bit after a data word (byte).
Turnaround character	CR	CR	CR	Selects the carriage return (CR) character as the line turnaround character.
Interface	EIA-232	EIA-232	EIA-232	Uses the EIA-232 interface protocol.
Line control	IPRTS	IPRTS	IPRTS	Uses the 'permanent request to send' (IPRTS) signal to communicate with system unit.
Break signal (ms)	500	500	500	The terminal sends a 'break signal' to the system unit within 500 ms after the Break key is pressed.
Send null suppress	On	On		Trailing null characters are not sent to the system unit.
Send null			On	Trailing null characters are sent to the system unit.
Response delay (ms)	100	100	100	The terminal waits for 100ms for the system unit to respond.

Additional Keyboard Attributes

The following keyboard attributes are for the keyboard attached to the 3151, 3161, and 3164 terminals.

Keyboard Setup Attributes	3151/11 /31/41 Settings	3151 /51/61 Settings	3161 /3164 Settings	Description
Enter	Return	Return	Return	The Enter key functions as the Return key.
Return	New line	New line	New line	The cursor moves to the next line when the Return key is pressed.
New line	CR	CR	CR	The Return key generates the carriage return (CR) and the line feed (LF) characters. The line turnaround occurs after the CR and LF characters are generated.
Send	Page	Page	Page	The contents of the current page are sent to the system unit when the Send key is pressed.
Insert character	Space	Space	Space	A blank character is inserted when the Insert key is pressed.

Additional Printer Attributes

The following printer attributes are for a printer attached to the 3151, 3161, and 3164 terminals.

Printer Setup Attributes	3151/11 /31/41 Settings	3151 /51/61 Settings	3161 /3164 Settings	Description
Line speed	9600	9600	9600	Uses 19200 or 9600 bps (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects eight bits as a data word length (byte).
Parity	Even	Even	No	
Stop bit	1	1	1	Places a bit after a data word (byte).
Characters	ALL	ALL		
Line end			CR-LF	
Print			View-port	
Print EOL			Off	
Print null			Off	

Appendix C. Service Processor Information

The Service Processor menus enable you to configure Service Processor options and to enable and disable functions.

Service Processor menus are available using an ASCII terminal when the server is powered 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 loss of surveillance).

During the first power up (i.e. 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 down, Service Processor menus become available after 15 seconds.

For a summary of the Service Processor functions and the methods for invoking them, see the table on page C-2.

Service Processor Functions	Service Processor Menus (ASCII terminals)	Service Processor Service Aids (ASCII or graphics terminals)	SMS (ASCII or graphics terminals)
Read VPD	Y ³		Y ³
View System Environmental 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

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

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

When the server is powered down, the Service Processor menus may 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 5 minutes of inactivity. Menus may be resumed by pressing any key on the terminal, local or remote.

How to access Service Processor menus locally

Service Processor menus may be accessed locally by connecting an ASCII terminal to either serial port. 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. Next the Service Processor prompts you for a password (if set), and when verified, displays the Service Processor menus.

How to access Service Processor menus remotely

Service Processor menus may be accessed remotely by connecting a modem to serial port 1 or serial port 2.

- Power off the server, unplug the power cord, and press the power button to drain capacitance while power is disconnected.
- Connect the modem to the appropriate serial port and turn the modem on.
- Plug in the server.

Note: If your modem has not been configured, go to “CALL-IN/CALL-OUT SETUP MENU” on page C-19.

With a terminal or terminal emulator, call the server's modem. The Service Processor prompts you for a password (if set), and when verified, displays the Service Processor menus.

General User Menus

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

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 reads either **1>** or **2>** to indicate which serial port on the system unit 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 the VPD information that was in effect after the last system boot. This information is usually identical with the results from the menu selection "Read VPD," but in the case of configuration updates or certain faults, this historical comparison can be useful to System Administrators and service personnel.

- **Read Progress Indicators from last Boot**

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

The progress indicators are displayed in two sections. Above the dashed line are the progress indicators (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 indication codes are listed top (latest) to bottom (oldest). The dashed line merely represents the point where the latest boot started.

Use the posted code indicated by the <-- arrow.

- **Read Service Processor Error Logs**

Displays the Service Processor error logs.

The time stamp in this error log is Coordinated Universal Time (CUT), a.k.a. Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp with local time. See page C-37 for an example of the error log.

- **Read System POST Errors**

Selecting this item lets you review the results of the POST (Power-On Self Test). Your server may be able to start in the presence of POST errors if there is sufficient working system resources. If POST errors occur during start-up, this error log when used with the diagnostics helps to isolate faults. See page C-38 for an example of the POST error screen.

- **View System Environmental Conditions**

On selection of this menu, the Service Processor reads all environmental sensors and reports the results to the user. This option maybe useful when surveillance fails, as it allows the user to determine the environmental conditions that may be related to the failure. See page C-15 for an example of the System Environmental Conditions screen.

Privileged User Menus

The following menus are available to privileged users only. The user must know the Privileged Access Password in order to access these menus.

MAIN MENU

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

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

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

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

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

```
Service Processor Firmware
EPROM: 19970915
FLASH: 19970512
Copyright 1997, IBM Corporation
  SYSTEM NAME
```

MAIN MENU

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

1>

Service Processor SETUP 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
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 8 alphanumeric characters. You can enter longer passwords, but the entries are truncated to include only the first 8 characters. Passwords can be set from the Service Processor menu or from the SMS 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 (via a modem). The error threshold is 3.

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

If the error threshold is reached by someone entering passwords remotely, the Service Processor disconnects the modem to prevent potential security attacks on the server by unauthorized remote users.

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

Privileged Access Password	General Access Password	Resulting Menu
None	None	MAIN MENU displayed
None	Set	MAIN MENU displayed
Set	None	User's with password see the MAIN MENU Others users see the GENERAL USER 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 server.

- **Enable/Disable Console Mirroring**

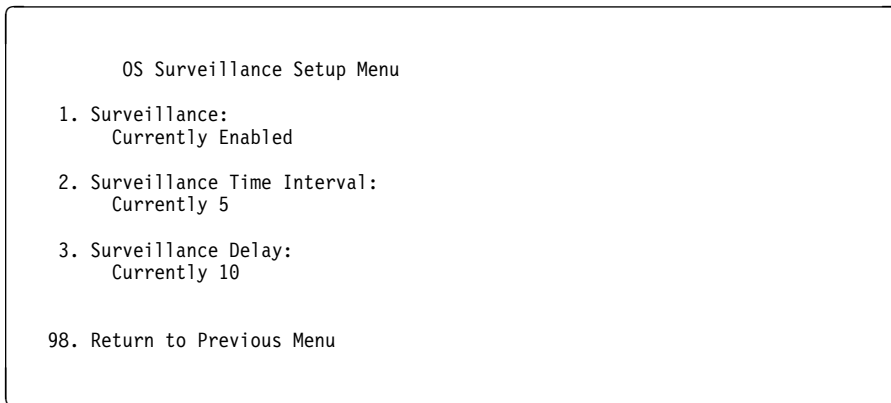
When Console Mirroring is enabled, the Service Processor sends information to both serial ports. This capability may be enabled by local or remote users. This provides local users the capability to monitor remote sessions. Console mirroring may be enabled for the current session only. For more information, see “Console Mirroring” on page C-34.

- **Start Talk Mode**

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

- **Surveillance Setup Menu**

This option may be used to setup operating system surveillance.



- **Surveillance**

- May be set to Enabled or Disabled.

- **Surveillance Time Interval:**

- May be set to any number from 2 to 255 minutes.

- **Surveillance Delay:**

- May be set to any number from 0 to 255 minutes.

Refer to “Service Processor System Monitoring - Surveillance” on page C-31 for more information about surveillance.

- **Reset Service Processor** - Allows the user to reinitialize the Service Processor.
- **Reprogram Service Processor Flash EPROM** - This is an automatic process.

An update diskette can be acquired from the RS/6000 Support page on the Internet or from your service team. The Internet address is:

<http://www.rs6000.ibm.com/support/micro>

The update files must be downloaded to a DOS-formatted diskette. You should format the diskette just prior to receiving the download, to be sure it is clean. Reformatting is worth the time and effort. When this process is selected, you are prompted to place the diskette into the drive and to indicate to the system that the diskette is available and the automatic process starts. If the system has other needs, you are prompted. See “Service Processor Firmware Updates” on page C-35 for additional information and update methods.

SYSTEM POWER CONTROL MENU

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
98. Return to Previous Menu
99. Exit from Menus

1>

- **Enable/Disable Unattended Start Mode**

This option may be used to instruct Service Processor to immediately power-on the server after a power failure, bypassing power-on password verification. Unattended Start Mode can also be set via SMS Menus. It is intended to be used on servers that require automatic power-on after a power failure.

- **Ring Indicator 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, Ring Indicate Power-On is enabled, the server is powered on at the predetermined number of rings. If the server is already on, no action is taken. In either case, the telephone call is not answered. The caller receives no feedback that the server powered-on. The **Ring Indicator Power-On Menu** and defaults are shown below:

```
Ring Indicator Power-On Menu

1. Ring Indicate Power-On :
   Currently Disabled
2. Number of Rings :
   Currently 6

98. Return to Previous Menu
```

- Ring Indicate Power-On may be set to 'Enabled' or 'Disabled'.
- Number of Rings may be set to any number from 1 to 255.

- **Reboot/Restart Policy Setup Menu**, see “Reboot/Restart Policy Setup Menu” on page C-25.

- **Power-on System**

Lets you power-on the system immediately. For other power-on methods see “System Power-On Methods” on page C-28.

- **Power-off System**

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

SYSTEM INFORMATION MENU

SYSTEM INFORMATION MENU

1. Read VPD Image from Last System Boot
2. Read Progress Indicators from Last System Boot
3. Read Service Processor Error Logs
4. Read System POST Errors
5. Read NVRAM
6. Read Service Processor Configuration
7. View System Environmental Conditions
8. Processor configuration/deconfiguration Menu
9. Memory configuration/deconfiguration Menu
98. Return to Previous Menu
99. Exit from Menus

1>

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

Displays the VPD information that was in effect after the last system boot. This information is usually identical with the results from the menu selection "Read VPD," but in the case of configuration updates or certain faults, this historical comparison can be useful to System Administrators and service personnel.

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

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

The progress indicators are displayed in two sections. Above the dashed line are the progress indicators (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 indication codes are listed top (latest) to bottom (oldest). The dashed line merely represents the point where the latest boot started.

Use the posted code indicated by the <-- arrow.

- **Read Service Processor Error Logs**

Displays error conditions detected by the Service Processor.

The time stamp in this error log is Coordinated Universal Time (CUT), a.k.a. Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp the errors with the local time. See C-37 for an example of the error log.

- **Read System POST Errors**

Selecting this item lets you review the results of the POST (Power-On Self Test). Your system unit may be able to start in the presence of POST errors if there is sufficient working system resources. If POST errors occur during start-up, this error log when used with the diagnostics. See page C-38 for an example of the POST error screen.

- **Read NVRAM**

Displays non-volatile random access memory (NVRAM) contents.

- **View System Environmental Conditions**

The Service Processor reads all environmental sensors and reports the results to the user. This option is most useful when surveillance fails, as it allows the user to determine the environmental conditions that may be related to the failure.

The following is an example of the system environmental conditions screen:

```
System Environmental Conditions
(System Power is currently off.)

Fan 0: A stopped fan detected
Fan 1: A stopped fan detected
Fan 2: A stopped fan detected
Fan 3: A stopped fan detected
MEM Temperature is operating within normal tolerances
I/O Temperature is operating within normal tolerances
CPU Temperature is operating within normal tolerances
5.0 Volts: A low 5.0 Voltage reading detected
3.3 Volts: A low 3.3 Voltage reading detected
5.0 Standby Volts: is operating within normal tolerance
+12.0 Volts: A low +12.0 voltage reading detected
-12.0 Volts: A high -12.0 voltage reading detected
(Press Return to Continue)
```

- **Processor Configuration/Deconfiguration Menu**

This option allows the user to see and modify processor configuration.

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

```
PROCESSOR CONFIGURATION/DECONFIGURATION MENU

Processor Number

0. Configured by system (0x11)
2. Configured by system (0x11)

98. Return to Previous Menu

To change the configuration, select the processor number
1>
```

The user can manually configure or deconfigure any processor, regardless of failure status, through this Service Processor menu. The configuration process takes place during the system power-up. Therefore, the configuration displayed in STANDBY mode reflects the configuration during the last boot. To view the current configuration, access the Service Processor menu after the system boots up. When the user selects a processor, its state toggles between configured and deconfigured. Processors that are not present are not listed. A processor can be in any of the following four states:

- **Configured by System:** The processor is present, and has not exceeded the number of failure threshold. It is configured by the system and is available.
- **Deconfigured by System:** The processor is present, but has exceeded the number of failure threshold. It is deconfigured by the system and is currently unavailable.
- **Manually configured:** The processor is present and available. It is configured by the user through the Service Processor menus.
- **Manually deconfigured:** The processor is present, but unavailable. It has been deconfigured by the user through the Service Processor menus.

- **Memory Configuration/Deconfiguration Menu**

This option allows the user to see and modify memory configuration.

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

```
MEMORY CONFIGURATION/DECONFIGURATION MENU

DIMMs on Memory Card #0:

DIMMs on Memory Card #1:
  1. Configured by system (0x0)

98. Return to Previous Menu

Enter card number _AND_ DIMM number separated by a space.
1>
```

The user can manually configure or deconfigure any memory DIMM, regardless of failure status, through this Service Processor menu. The configuration process takes place during the system power-up. Therefore, the configuration displayed in STANDBY mode reflects the configuration during the last boot. To view the current configuration, access the Service Processor menu after the system boots up. When the user selects a memory DIMM, its state will toggle between configured and deconfigured. Memory DIMMs that are not present are not listed. A memory DIMM can be in any of the following four states:

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

LANGUAGE SELECTION MENU

LANGUAGE SELECTION MENU

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

1>

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

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

CALL-IN/CALL-OUT SETUP MENU

CALL-IN/CALL-OUT SETUP MENU

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

1>

- **Modem Configuration Menu**, see “Modem Configuration Menu.”
- **Serial Port Selection Menu**, see “Serial Port Selection Menu” on page C-20.
- **Telephone Number Setup Menu**, see “Telephone Number Setup Menu” on page C-21.
- **Call-Out Policy Setup Menu**, see “Call-Out Policy Setup Menu” on page C-23.
- **Customer Account Setup Menu**, see “Customer Account Setup Menu” on page C-24.
- **Ring Indicate Power-On Menu**, see on page C-13.

Modem Configuration Menu

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

For information on choosing a modem configuration file, see “Sample Modem Configuration Files” on page C-42 and “Seamless Transfer of a Modem Session” on page C-47.

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. modem_f_sp
4. modem_f0_sp
5. modem_f1_sp
6. modem_z_sp
7. modem_z0_sp
8. none

9. Save configuration to NVRAM and Configure modem

98. Return to Previous Menu

Serial Port Selection Menu

Serial Port Selection Menu

1. Serial Port 1 Call-Out:
Currently Disabled

2. Serial Port 2 Call-Out:
Currently Disabled

3. Serial Port 1 Call-In:
Currently Disabled

4. Serial Port 2 Call-In:
Currently Disabled

98. Return to Previous Menu

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

Serial Port Speed Setup Menu

Serial Port Speed Setup Menu

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

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

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

Telephone Number Setup Menu

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

- Service Center Telephone Number - The telephone number of the maintenance provider's computer.
- Customer Administration Center Telephone Number - The telephone number of the local system support provider's computer.
- Digital Pager Telephone Number - The number for a pager carried by someone who will respond to problem calls from your server.
- Customer Voice Telephone Number - The telephone number service personnel will use to reach the system user.
- Customer System Telephone Number - The telephone number to which the server's modem is connected.

Telephone Number Setup Menu

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

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 Service Processor conforms. For more information about the format and catcher computers, refer to the README file in the AIX /usr/samples/syscatch directory. Contact your service provider for the correct telephone number to enter here. Until you have that number, leave this field blank.
 - **Customer Administration Center Telephone Number** is the number of the System Administration Center computer (catcher) that receives problem calls from servers. Contact your system administrator for the correct telephone number to enter here. Until you have that number, leave this field blank.
 - **Digital Pager Telephone Number** is the number for a pager carried by someone who responds to problem calls from your server. Contact your administration center representative for the correct telephone number to enter here. For test purposes, enter your telephone number here. You can change it later when testing is complete.
- Note:** Some modems, such as IBM 7857-017, 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 in the following example:

1 800 123 4567,,,,87654

where the commas create pauses¹ for the voice response system, and the 87654 represents the PIN.

- **Customer Voice Telephone Number** is the telephone number of a phone near the server or answered by someone responsible for the server. This is the telephone number left on the pager for callback. For test purposes, enter your telephone number here. You can change it after testing is completed.

Customer System Telephone Number is the telephone number to which your server's modem is connected. The service or administration center representatives need this number to make direct contact with your server for problem investigation. This is also referred to as the **call-in** phone number.

Call-Out Policy Setup Menu

```
CALL-OUT POLICY SETUP MENU

1. Call-Out policy (First/All):
   Currently First
2. Remote timeout, (in seconds):
   Currently 120
3. Remote latency, (in seconds):
   Currently 2
4. Number of retries:
   Currently 2
98. Return to Previous Menu

1>
```

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

¹ The length of these pauses is set in modem register S8. The default is usually 1 or 2 seconds each.

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

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

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

Number of retries is the number of times you want the server to retry calls that resulted in busy signals or other error messages.

Customer Account Setup Menu

Customer Account Setup Menu

1. Customer Account Number:
Currently Unassigned
2. Customer RETAIN Login UserID:
Currently Unassigned
3. Customer RETAIN Login Password:
Currently Unassigned
98. Return to Previous Menu

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 blank.
- **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 blank if your service provider does not use RETAIN.

Reboot/Restart Policy Setup Menu

Reboot describes bringing the system hardware back up from scratch, 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 reinitialized. Restart must follow a successful reboot.

```
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>
```

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

- **Enable supplemental restart policy** - The default setting is NO. If set to YES, the Service Processor restarts the system when the system loses control as detected by the Service Processor surveillance, and either:
 1. The **Use OS-Defined restart policy** is set to NO
OR
 2. The **Use OS-Defined restart policy** is set to YES and the operating system has NO automatic restart policy.

Refer to “Service Processor Reboot/Restart Recovery” on page C-29.
- **Call-Out before restart (Enabled/Disabled)** If a restart is necessary due to a system fault, you can enable the Service Processor to call out and report the event. This item is valuable if the number of these events becomes excessive, signalling a bigger problem.

Service Processor Functions and Features

The following section discusses some of the Service Processor functions and features more fully.

The 7043 Model 260 supports the following functions:

Built-in Functions	Initialization and Test	Service Processor 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 fail
		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
Application Interface Functions	Monitor/Sense	Thermal/Voltage/fan speed
		Service Processor Flash Update(Recovery and Composite)

System Power-On Methods

- Power-on Switch - see “Operator Panel” on page 1-8.
- Service Processor Menu power-on request

You can request a power-on via the Service Processor menus from either a local or remote terminal.

If a remote terminal is to be used, the modem must be connected to serial port 1, and the operating system set up to enable a TTY login session on that port.

Refer to “Seamless Transfer of a Modem Session” on page C-47 for information on transferring modem sessions from Service Processor to the operating system.

- Unattended start mode - refer to **Enable/Disable Unattended Start Mode** on page C-12.

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). When AC power is restored, the system returns to the then current power state at the time AC loss occurred. For example, if the system was powered-on when AC loss occurred, it reboots/restarts when power is restored. If the system was powered-off when AC loss occurred, it remains off when power is restored.

- Timed power-on - refer to the shutdown `-t` command on servers using AIX.

Working in conjunction with AIX, the Service Processor in your server can operate a timer, much like the wake-up timer on your clock radio. You can set the timer so that your server powers on at a certain time after shutting down. The timer is battery operated, so power interruptions occurring while the server is off do not affect its accuracy. Refer to the shutdown `-t` command of AIX for details on setting the timer.

Because of the potential for AC power loss, the Timed Power-On function of AIX can only be assured when Unattended Power-On Mode is enabled. If a Timed Power-On event occurs during an AC power loss, and if Unattended Power-On Mode is enabled, the system starts when AC power is restored.

If Unattended Start Mode is disabled (the default), the system power state remains off when AC power is restored, regardless of the power state of the system when AC loss occurred.

- Ring Indicate Power-On

Enabling ring indicate power-on disables remote call-in. If ring indicate power-on is enabled, the server powers on at a predetermined number of rings. If the server is already on, no action is taken. In either case, the telephone call is not answered. The caller receives no feedback that the server powered on.

- Follow-up to a Failed Boot Attempt

The Service Processor initiates a power-on sequence upon detection of a failed boot attempt.

Service Processor Reboot/Restart Recovery

Reboot describes bringing the system hardware back up from scratch, 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 reinitialized. Restart must follow a successful reboot.

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 (via surveillance). If progress stops, the Service Processor can reinitiate the boot process (reboot) if enabled to do so. The Service Processor can re-attempt this process according to an entry on 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). If OS activity stops, 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), the Service Processor takes over for AIX to reboot/restart after a Check Stop 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.

If the operating system has no automatic restart policy, or if it is disabled, then the Service Processor restart policy can be controlled from the Service Processor Menus by using the Enable Supplemental Restart Policy selection.

Use OS-Defined restart policy?: The **Use OS-Defined restart policy** default setting is YES. This causes the Service Processor to refer to the OS Automatic Restart Policy setting and take action, the same action the OS would take if it could have responded to the problem causing the restart.

When this setting is NO, or if the OS did not set a policy, the Service Processor refers to Enable supplemental restart policy for its action.

Enable Supplemental Restart Policy?: The default setting is NO. If set to YES, the Service Processor restarts the system when the system loses control as detected by the Service Processor surveillance, and either:

1. The **Use OS-Defined restart policy** is set to NO
OR
2. The **Use OS-Defined restart policy** is set to YES and the operating system has NO automatic restart policy.

Refer to “Service Processor Reboot/Restart Recovery” on page C-29.

The following provides a more thorough understanding of the relations among the OS and Service Processor restart controls:

OS Automatic reboot/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

Service Processor System Monitoring - Surveillance

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

Surveillance is available during two phases:

1. System firmware bring-up (automatic) and
2. Operating system runtime (optional).

System Firmware Surveillance: Provides the Service Processor with a means to detect boot failures while the system firmware is running.

System firmware surveillance is automatically enabled during system power-on. It cannot be disabled via a user selectable option.

If the Service Processor detects no heartbeats during system boot (for 7 minutes), it cycles the system power to attempt a reboot. The maximum number of retries is set from the Service Processor menus. If the fail condition repeats, the Service Processor leaves the machine powered on, logs an error and offers menus to the user. If Call-out is enabled, the Service Processor calls to report the failure and displays the operating system surveillance failure code on the operator panel.

Operating System Surveillance: Provides the Service Processor with a means to detect hang conditions, hardware or software failures while the operating system is running. It also provides the operating system with a means to detect the Service Processor failure by the lack of a return heartbeat.

Operating system surveillance is enabled by default. This is to allow the user to run operating systems that do not support this Service Processor option.

Operating system surveillance can be enabled and disabled via:

- Service Processor Menus
- Service Processor Service Aids

Three parameters must be set for operating system surveillance:

1. Surveillance enable/disable
2. Surveillance interval

This is the maximum time in minutes the Service Processor should wait for a heartbeat from the operating system before timeout.

3. Surveillance delay

This is the length of time in minutes for the Service Processor to wait from when the operating system is started to when the first heartbeat is expected.

Surveillance takes effect immediately after setting the parameters 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, 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 (Call-Home)

The Service Processor can call out (Call-Home) when it detects one of the following conditions:

- System firmware surveillance failure.
- Operating system surveillance failure (if supported by Operating System).
- Critical environmental failures.
- Restarts

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

- Have a modem connected to serial port 1 or 2.
- Set up the following using the Service Processor Menu or Diagnostic Service Aids:
 - Enable call out for the serial port where the modem is connected.
 - Set up serial port line speed.
 - Enter the modem configuration filename.
 - Set up site specific parameters (i.e. phone numbers for call out, call out policy, etc).
- To call out before restart, set “Call-Out before restart” to ENABLED from the Reboot/Restart Policy Setup menu.

Note: Some modems, such as IBM 7857-017, are not designed for the paging function. Although they can be used for paging, they 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.

Console Mirroring

Console mirroring allows a person on a local ASCII terminal to monitor the Service Processor activities of a remote user. Console mirroring ends when the Service Processor releases control of the serial ports to the system firmware.

System Configuration:

- Service Processor
- Modem connected to one serial port and enabled for incoming calls
- Local ASCII terminal connected to the other serial port. This local terminal may be connected directly to your server or connected through another modem.

There are two scenarios in which console mirroring can be invoked:

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

Note: A quick disconnect is accomplished by hitting the key sequence Ctrl+D on either console. Both sessions exit the Service Processor menus.

Service Processor Firmware Updates

The Service Processor EPROM may need to be updated for two different reasons:

1. The UPDATE (composite) portion of the EPROM has become corrupted.
2. The Service Processor firmware upgrades, without any corruption present.

The use of a Flash EPROM allows updates to occur without physically replacing the memory.

The firmware in your server can be updated using one of four available initiation processes:

1. Service Processor initiation
2. SMS Utilities initiation
3. Service Aids initiation
4. AIX initiation.

Each initiation method is described below. In each case, the process prompts you for your authority and shows the contents of the update media. Verify the file with which to perform the update, and follow any other instructions that may appear. After initiation, the processes are identical and automatic.

There are two areas in each firmware module that may need updating:

1. The gold code or base code or EPROM area.
2. The custom or main program or FLASH area.

Each update file contains matching gold and custom firmware, so it is not possible to update to a conflicting set.

Before the update process begins, the versions of each of the two areas of the target firmware module are compared to the versions on the update diskette. Only the area(s) that need updating are updated. In most cases, only the custom area is updated.

An update diskette can be acquired from the RS/6000 Support page on the Internet or from your service team. The Internet address is:

<http://www.rs6000.ibm.com/support/micro>

The update files must be downloaded to a DOS-formatted diskette. You should format the diskette just prior to receiving the download, to be sure it is clean. Reformatting is worth the time and effort.

Refer to the downloaded update instructions, or to the System Management Services “Config” on page 3-4 or “Display Configuration” on page 3-25 or Service Processor menu on page C-7, to determine the level of the system unit or service processor flash.

Updating Firmware from the Service Processor Menus: The Service Processor Menus are available while the server is powered off. From the Service Processor Main Menu, select Service Processor Setup to bring up a menu containing the item, Reprogram Service Processor Flash EPROM. Selecting that item starts the update process. The process requests the update diskette(s) as needed. After inserting the first diskette and informing the system, the process continues automatically. If the process requires user assistance, it is requested.

Updating Firmware from the SMS Utilities: From a powered down or reset condition, bring up the SMS Utilities and select the menu item for updating firmware. The process requests the update diskette(s) as needed. After inserting the first diskette and informing the system, the process continues automatically. If the process requires user assistance, it is requested.

Updating Firmware from the Service Aids

Note: This service aid is only supported for Online Diagnostics.: This service aid allows you to update the system or service processor flash.

Additional update and recovery instructions may be provided; also you need to know the fully qualified path and file name of the flash update image file. If the flash update image file is on a diskette, you need the AIX DOS utilities package to process the diskette. You can use the `dosdir` command to find out the name of the update image file. This service aid uses the `dosread` command to put the file into the **/var** file system.

Using this service aid to update the system or service processor flash does not save the current contents of the flash.

The flash image file will be copied in the **/var** file system. If there is not enough space in the **/var** file system for the flash update image file, an error is reported. If this occurs, exit the service aid, increase the size of the **/var** file system and retry the service aid. After the file is copied, a warning screen asks for confirmation to continue the flash update. Continuing the flash update eventually causes the system to reboot and return to the AIX login prompt. After the system unit reboots, the file **/var/update_flash_image** can be removed to conserve space in the **/var** file system.

Updating Firmware from AIX

You must delete the file `/var/update_flash_image` before proceeding.

The flash update image file must have already been placed in the `/var` file system. This could have been done with a file transfer from another server or with the **dosread** command of the AIX DOS Utilities, for example. With the flash update image in place, issuing the following AIX command

```
shutdown -u /var/*filename*.img
```

initiates the update process. Where `*filename*` is the name of the flash update image. During the process, the server powers down and reboots. You know the process is complete when the login prompt reappears.

Service Processor Logs

Service Processor Error Log: The Service Processor error logs contain error conditions detected by the Service Processor.

```
                                Error Log
19970626223337  0. Loss of Redundant Fan #5
                  40210091

Press "C" to clear error log, any other key to continue. >
```

The time stamp in this error log is Coordinated Universal Time (CUT), a.k.a. Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp with local time.

System POST Errors: If POST (Power-On Self Test) errors occur during start-up, this error log help isolate faults when used with the diagnostics.

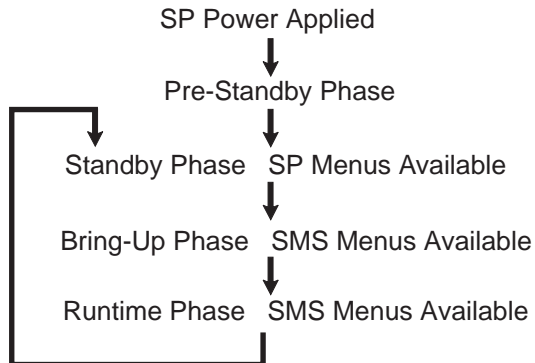
Read System POST Errors

```
Version : 0  
Severity : 0  
Disposition : 0  
Initiator : 0  
Event being reported : 0  
Extended Error Log Data:  
0xC2 0x00 0x84 0x09 0x00 0x00 0x00 0x00  
0x20 0x00 0x00 0x00 0x00 0x00 0x72 0x74  
0x63 0x00 0x00 0x00 0x00 0x00 0x00 0x00  
0x00 0x00 0x28 0x03 0x00 0x05 0x00 0x01  
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00  
0x49 0x42 0x4D 0x00 0x55 0x30 0x2E 0x31  
0x2D 0x50 0x31 0x2D 0x58 0x31 0x00
```

(Press Return to Continue)

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:

- SP Initialization

SP performs any necessary hardware and software initializations.

- SP POST

SP conducts Power-On Self Tests on its various work and code areas.

- SP Unattended Start Mode Checks

To assist fault recovery. If unattended start mode is set, the SP automatically reboots the server. SP does not wait for a user-input or power-on command, but moves straight through the phase and into the Bring-up Phase. The unattended start mode can be reset by accessing SMS menus, or SP menus.

Standby Phase: The standby phase can be reached in two ways:

1. With the server OFF and power connected (the normal path), recognized by 0K in the LCD display.
2. With the server ON after an operating system fault, recognized by STBY or an 8-digit code in the LCD display.

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

The Standby phase components are:

- Modem Configuration
SP will configure the modem (if installed) so that incoming calls may be received, or outgoing calls may 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 SP menus are password protected. Before you can access them you need to know 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:

- Retry Request Check
The SP checks to see if the previous boot attempt failed. If two consecutive fails 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 SP can dial a pre-programmed telephone number in the event of an IPL failure. The SP issues an error report with the last reported IPL status indicated and any other available error information.

- Update Operator Panel

The SP displays Operator Panel data on the ASCII terminal if a remote connection is active.

- Environmental Monitoring

Environmental Monitoring is now controlled by the Service Processor instead of the base system, with expanded error recording and reporting.

- System Firmware Surveillance (Heartbeat Monitoring)

The SP monitors and time 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 SP monitors the system heartbeat. If the heartbeat times out, the SP places an outgoing call.

This is different from the Bringup Phase scenario where two 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 back to the customer settings.

Modem Configurations

Sample Modem Configuration Files

With nearly 1000 modems to choose from, and various programming standards, configuring a modem for use with the Service Processor can be challenging. The Service Processor is designed to place little demand on an attached modem, thereby increasing the setup and connection success rates. Several sample modem configurations files are supplied that either work directly with your modem, or provide a good starting point for a custom setup, if required. These files are included on the Sample Modem Configuration Files diskette and in your Service Processor firmware with the following names:

Diskette File Name	Service Processor 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

The sample modem configuration files can be found in the `/usr/share/modems` subdirectory, if your server is using AIX. A listing of each file is included at the end of this appendix.

With the following selection procedures and your modem manual, one of these configuration files should be suitable for your use.

Configuration File Selection

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

If yes, go to 3

If not, continue with 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.

If yes, go to 5 on page C-44

If not, continue with 3 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, and enabled is the default, this test must be disabled. See "Customizing the Modem Configuration Files" on page C-45 for more information.

If not, continue with Step 4 on page C-44.

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. Selection is complete. If you find it necessary to adjust any of these configuration files, do so with reference to the manual that came with your modem.² Choose settings that enable hardware flow control and respond to DTR.

Examples

Modem	Setup Z	Setup Z0 (Rare)	Setup F	Setup F0	Setup F1
AT&T Data Port 2001 *				X	
Bocamodem 1440E			X		
Hayes Smart Modem 300	X				
IBM 5841	X				
IBM 5843	X				
IBM 7851				X	
IBM 7852-010				X	
IBM 7855					X
US Robotics 33.6K Sportster					X
Zoom V.32			X		

*Ring interrupt only on first ring.

² 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.

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 Service Processor menus.

Note: If you have already set up your serial ports, line speeds, authorizations and telephone numbers from the Service Processor 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 Service Processor 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 to modify.

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

Make this change to the third line of each of the following stanzas:

- `condout`
 - `condin`
 - `ripo`
4. Save the changes.

Use this new modem configuration file as described at the top of this section.

Xon/Xoff Modems: Some modems of the mid-80's vintage 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 tolerate these extra characters. If your configuration includes such a modem, your functional results may be unpredictable.

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

Most newer modems do not use this design. It is recommended you use modems of newer vintage if you experience unexplainable performance problems that may be due to Xon/Xoff characters.

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 they receive. AT&T Data Port 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 may choose to start Ring Indicate Power-On on any ring count that makes your operation convenient.

Terminal Emulators: The Service Processor is compatible with simple ASCII terminals, and therefore compatible with most emulators. It is for the cases when a remote session is handed off from the Service Processor to the operating system that agreeing terminal emulators becomes important.

The server's operating system has some built-in terminal emulators. You 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 match. This assures successful communications and control.

For best formatting, choose line wrap in your terminal emulator setup.

Recovery Procedures: Line noises, power surges, etc., can sometimes cause your modem to enter an undefined state. When it is being used for dial in, dial out or Ring Indicate Power-On, your modem is initialized each time one of these actions is expected. If one of these environmental conditions occur after your modem has been initialized, it may be necessary to recover your modem to a known state.

If your modem communicates properly with remote users, it is probably in control. It may be wise to occasionally change some of the functional settings and then change them back, just for the sense of security that the modem is communicating, and to assure it has been initialized recently.

Another strategy, particularly if your system is difficult to access physically, is to protect it with an Uninterruptable Power Source (UPS) and a phone-line surge protector.

In case recovery becomes necessary, your system should be shut down as gracefully as possible. Disconnect the power cable and press the power button to drain capacitance while power is disconnected. Disconnect and reconnect modem power, then reconnect system power to allow complete reinitialization of your system.

Seamless Transfer of a Modem Session

There are about as many modem command variations as there are modems. The sample modem configuration files have been written to capture the largest number of workable modem settings.

The modem command `&Dn` (where 'n' is a number) generally sets the modem response to the Data Terminal Ready (DTR) signal from the server's serial port. The desired response is that the modem will hold a connection while DTR is enabled, and drop the connection when DTR is released. This is the mechanism by which the server "hangs up" on a connection under normal conditions.

Usually the command `&D2` works, but not always. The sample modem configuration files³ take this high percentage position. 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. Does 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 files³.

2. Does 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` does 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 model manual for this information. The &Dn command appears in three places each in three of the sample modem configuration files³.

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, you call the server back and the operating system answers and offer you the login prompt.

³ 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.

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 no longer experiences 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 is sent to any serial device attached to that port. As a result, that serial device's connection and function could be affected. These impacts may make that port unattractive for devices other than a temporary local ASCII terminal.

Modem Configuration Samples

Sample File modem_z.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP Z
#
# FUNCTIONS: Modem configuration file for many early Hayes* compatible modems.
# This example uses the ATZ reset command to choose the factory defaults.
# This setup will work for many modems, but it is required for early vintage
# modems which respond to neither the ATZ0 reset command nor the extended (&)
# commands. Refer to your modem manual.
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code          , Inserts delay in dialing commands
# Z Reset to factory defaults Q0 Turn on responses
# E0 Turn echo off           Q1 Turn off responses
# V0 Use numeric responses    S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up                 T = Tone mode. When used as T\r, it is a
#                             no op to maintain program synchronization
#                             when modem may/will echo the commands.
#
# %N Call-Out phone number   %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:  send "ATZQ0\r"          # Reset to factory defaults.
          ignore "\0\r" or "OK\r\n" timeout 2 # Ignore modem response.
          send "ATE0\r"          # Initialize modem: Echo OFF,
          expect "\0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
          send "ATQ0V0\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
DefaultT0 10
CallDelay 120
# AT Attention Code          , Inserts delay in dialing commands
# Z0 Reset. Restore Profile 0 Q0 Turn on responses
# E0 Turn echo off          Q1 Turn off responses
# V0 Use numeric responses   S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up                X0=0 Limit modem response codes
#
#                               T = Tone mode. When used as T\r, it is a
#                               no op to maintain program synchronization
#                               when modem may/will echo the commands.
#
# %N Call-Out phone number   %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:  send "ATZ0Q0T\r"          # Reset modem. Select profile 0
          ignore "0\r" or "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

error: # Handle unexpected modem
# responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done

```

Sample File modem_f.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
# This example uses the AT&F reset command to choose the factory defaults.
# This set up is preferred for modems with extended (&) commands. For early
# vintage modems, setup Z or Z0 is recommended. If your modem responds to
# the extended (&) commands and to factory default choices (&Fn), setup file
# F0 or F1 is recommended.
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#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code          , Inserts delay in dialing commands
# &F Reset to default profile Q0 Turn on responses
# E0 Turn echo off          Q1 Turn off responses
# V0 Use numeric responses   S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up                X0=0 Limit modem response codes
#                               T = Tone mode. When used as T\r, it is a
#                               no op to maintain program synchronization
#                               when modem may/will echo the commands.
#
# &C1 Detect CD              &D2 Respond to DTR (often the default)
#
# %N Call-Out phone number  %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

connect: send "AT&F00T\r"          # Reset to factory defaults.
         ignore "\0\r" or "OK\r\n" timeout 2 # Ignore modem response.
         send "ATE0T\r"            # Initialize modem: Echo OFF,
         expect "\0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
         send "ATQ0V0X0T\r"        # Limit response codes.
         expect "\0\r" timeout 2    # Confirm commands successful.
         send "ATS0=0\r"           # Set AutoAnswer OFF
         expect "\0\r" timeout 2    # Confirm command successful.
         send "AT&C1&D2\r"         # Detect carrier and DTR.
         expect "\0\r" timeout 2    # Confirm command successful.
         done

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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#
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#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code , Inserts delay in dialing commands
# &F0 Reset. Restore profile 0 Q0 Turn on responses
# E0 Turn echo off Q1 Turn off responses
# V0 Use numeric responses S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up X0=0 Limit modem response codes
# T = Tone mode. When used as T\r, it is a
# no op to maintain program synchronization
# when modem may/will echo the commands.
#
# &C1 Detect CD &D2 Respond to DTR (often the default)
# &R1 Ignore RTS (CTS)
#
# %N Call-Out phone number %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout: send "AT&F0Q0T\r" # Reset modem. Select profile 0
         ignore "\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

conдин:  send "AT&F0Q0T\r"                # Reset modem. Select profile 0
ignore "\0\r" or "OK\r\n" timeout 2    # Ignore modem response.
send "ATE0T\r"                          # Initialize modem: Echo OFF,
expect "\0\r" or "OK\r\n" timeout 2    # Enable responses (Numeric),
send "ATQ0V0X0T\r"                     # Limit response codes.
expect "\0\r" timeout 2                 # Confirm commands successful.
send "ATS0=2\r"                          # Set AutoAnswer ON
expect "\0\r" timeout 2                 # Confirm command successful.
send "AT&C1&D2&R1\r"                   # Detect carrier and DTR,
                                                # Ignore RTS.

expect "\0\r" timeout 2                 # Confirm command successful.
done

waitcall: ignore "2\r" timeout 1         # Ignore first ring.
expect "2\r" timeout 10                 # Pick up second ring
                                                # or timeout.
                                                # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page:    send "ATDT%N,,,%R;\r"          # %N = pager call center number
                                                # Add enough commas to wait for
                                                # time to enter paging number.
                                                # %R = paging number

                                                # Confirm successful command.
expect "\0\r" timeout 60
delay 2                                  # Wait before hanging up.
send "ATH0T\r"                           # Hang up.
expect "\0\r" timeout 2                   # Confirm successful command.
done

riпо:   send "AT&F0Q0T\r"                # Reset modem. Select profile 0
ignore "\0\r" or "OK\r\n" timeout 2    # Ignore modem response.
send "ATE0T\r"                          # Initialize modem: Echo OFF,
expect "\0\r" or "OK\r\n" timeout 2    # Enable responses (Numeric),
send "ATQ0V0X0T\r"                     # Limit response codes.
expect "\0\r" timeout 2                 # Confirm commands successful.
send "ATS0=0\r"                          # Set AutoAnswer OFF
expect "\0\r" timeout 2                 # Confirm command successful.
send "AT&C1&D2&R1\r"                   # Detect carrier and DTR,
                                                # Ignore RTS.

expect "\0\r" timeout 2                 # Confirm command successful.

```

```
done                                # RI Power On enabled.
error:                               # Handle unexpected modem
                                     # responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done
```

Sample File modem_f1.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F1
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
# This example uses the AT&F1 reset command to choose the factory defaults.
# This set up is for modems with extended (&) commands and which do not work
# properly with setup F0. For early vintage modems, setup Z or Z0 is
# recommended.
#
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code           , Inserts delay in dialing commands
# &F1 Reset. Restore profile 1 Q0 Turn on responses
# E0 Turn echo off           Q1 Turn off responses
# V0 Use numeric responses    S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up                 X0=0 Limit modem response codes
#
#                               T = Tone mode. When used as T\r, it is a
#                               no op to maintain program synchronization
#                               when modem may/will echo the commands.
#
# &C1 Detect CD                &D2 Respond to DTR (often the default)
# &R1 Ignore RTS (CTS)
#
# %N Call-Out phone number    %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

connect: send "AT&F1Q0T\r"           # Reset modem. Select profile 1
         ignore "\0\r" or "\0K\r\n" timeout 2 # Ignore modem response.
         send "ATE0T\r"               # Initialize modem: Echo OFF,
         expect "\0\r" or "\0K\r\n" timeout 2 # Enable responses (Numeric),
         send "ATQ0V0X0T\r"           # Limit response codes.
         expect "\0\r" timeout 2      # Confirm commands successful.
         send "ATS0=0\r"              # Set AutoAnswer OFF
         expect "\0\r" timeout 2      # Confirm command successful.
         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
```

Appendix D. Replacing the Battery

CAUTION:

A lithium battery can cause fire, explosion, or a severe burn. Do not recharge, disassemble, heat above 100°C (212°F), solder directly to the cell, incinerate, or expose cell contents to water. Keep away from children. Replace only with the part number specified for your system. Use of another battery may present a risk of fire or explosion.

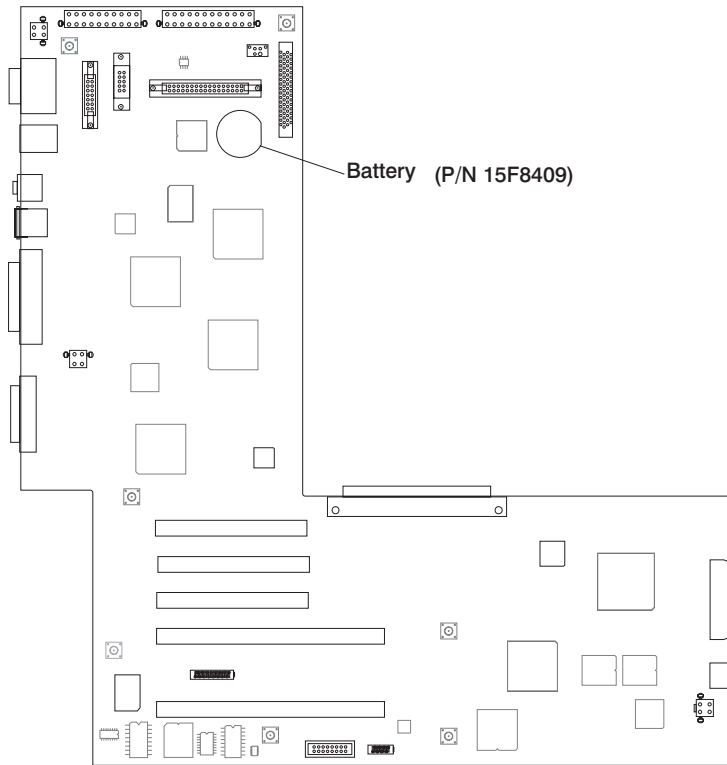
The battery connector is polarized; do not attempt to reverse polarity.

Dispose of the battery according to local regulations.

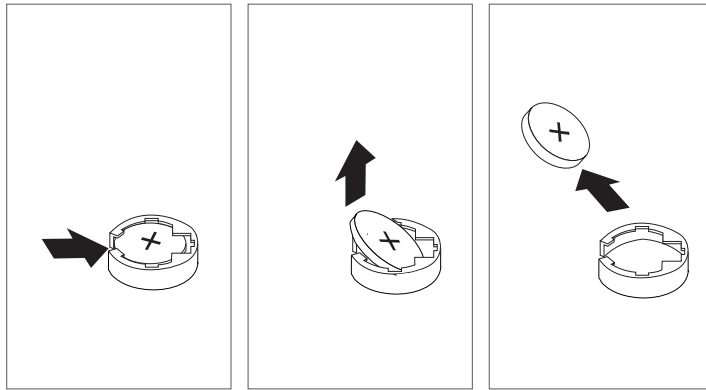
Removal of Battery

1. If you have not already done so, remove the covers as described in “Removal of Covers” on page 4-4.
2. Remove the processor and memory card cover as described in “Removal of Processor and Memory Card Cover” on page 4-9.

3. Locate the battery on the system board.

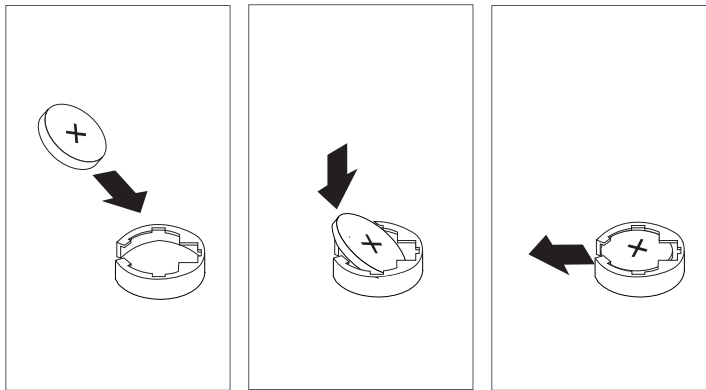


- Use one finger to slightly slide the battery toward the front of the server. (The spring mechanism behind the battery pushes it out toward you as you slide it forward.) Use your thumb and index finger to hold the battery as it pushes out of the socket.



Replacement of Battery

- Tilt the battery so that you can insert it into the front of the socket. As you slide the battery toward the front of the server, push it down into the socket.



Note: Be sure to tell the customer that the time and date need to be reset.

If running AIX the bootlist command may have to be run from AIX while logged in as root, this would restore the custom boot list and allow the option of Select Software under multiboot to start the operating system. Other parameters that may have to be rebuilt are the IP parameters.

Ensure that the battery polarity is correct; place the battery in the holder with the positive side facing up.

2. Replace the processor and memory card cover.
3. Replace the system unit covers

Index

Numerics

- 12/24GB 4mm Tape Drive
 - using 2-28
- 3.5-inch diskette drive
 - using 2-9
- 7135 RAIDiant array 6-38
- 7318 server service aid 6-39
- 8mm Tape Drive
 - using 2-21

A

- about this book xix
- account number C-24
- adapters
 - install 4-24
 - removal 4-25
- air circulation clearances 1-6
- AIX location codes 5-11, 5-14
- alter/display bootlist 6-17
- attributes required for TTY
 - terminal B-1
- audio ports 1-11

B

- battery
 - disposal, recycling xvii
 - removal and replacement D-1
- before you begin 1-2

C

- call home, see call out
- call out (call-home) C-33
- call-out
 - policy C-23

- CD-ROM drive
 - using 2-11
- check points C-4, C-14
- checklist, preinstallation 1-3
- clearances for air circulation 1-6
- connecting the cables 1-4
- connectors 1-11
- console mirroring
 - enable/disable C-10
 - quick disconnect C-34
 - system configuration C-34
- covers
 - removal 4-4
 - replacement 4-36
- customer administration center C-22

D

- device records A-2
 - internal and external options A-2
 - internal files and devices A-4
- devices, handling static-sensitive 4-2
- diagnostics
 - online 5-1
 - online diagnostics modes of operation 5-4
 - online diagnostics service mode 5-4
 - operating considerations 5-1
 - sources for programs 5-1
 - standalone 5-1
 - standalone diagnostics 5-7
 - TTY terminal attributes B-1
- dial-out telephone numbers,
 - setting C-21
- disk drive activity LED 1-10, 2-2
- disk drives
 - configuration 4-31
 - deconfiguration 4-31

disk drives (*continued*)
install 4-27
internal 4-26
removal 4-29
display/alter bootlist 6-17

E

electrical safety xiii
EPROM
updates C-35
Ethernet 1-11
Ethernet port 1-11

F

fibre channel RAID service aids 6-24
finishing the installation 1-6
flash SK-NET FDDI firmware 6-25

G

general access password,
changing C-10
general user menus C-4
graphical system management
services 3-1

H

handling static-sensitive devices 4-2
hardware problem determination 8-1
headset receptacle 1-10, 2-2
heartbeat C-31

I

installation procedures
adapters 4-24
disk drives 4-27
media drives 4-32
memory cards 4-11
memory modules 4-16

installation procedures (*continued*)
processor card 4-20

K

keyboards
using 2-3

L

language selection C-18
laser compliance statement xv
laser safety information xv
local area network service aid 6-28
location codes 5-9, 5-11
AIX 5-14
format 5-9
physical 5-9

M

media drives
install 4-32
removal 4-34
memory card
install 4-11
removal 4-13
memory module
install 4-16
removal 4-18
menus
general user C-4
privileged user C-6
service processor C-3
service processor call-in/call-out
setup C-19
service processor call-out policy
setup C-23
service processor customer account
setup C-24
service processor language
selection C-18

- menus (*continued*)
 - service processor reboot policy
 - setup C-25
 - service processor serial port
 - selection C-20
 - service processor serial port speed
 - setup C-21
 - service processor setup C-8
 - service processor system
 - information C-14
 - service processor system power
 - control C-12
 - service processor telephone
 - setup C-21
 - support menus
 - service processor menus C-2
 - service processor service
 - aids C-2
 - SMS C-2
- microphone receptacle 1-10, 2-2
- modem
 - configuration file selection C-43
 - configurations C-42
 - seamless transfer C-47
- modem_f.cfg, sample file C-54
- modem_f0.cfg, sample file C-57
- modem_f1.cfg, sample file C-60
- modem_z.cfg, sample file C-50
- modem_z0.cfg, sample file C-52
- mouse
 - using 2-5

N

- network service aid 6-28

O

- online diagnostics 5-1
- operational phases, SP
 - standby C-40

- operator panel display 1-10, 2-2
- option list 4-10
- options 4-10

P

- pager C-21, C-22
- parallel port 1-11
- passwords
 - changing general access
 - password C-10
 - changing privileged access
 - password C-10
 - overview C-9
- physical location codes 5-9, 5-11
- POST errors
 - read C-5
- power connector 1-11
- power on switch, location 1-10, 2-2
- power-on LED 1-10, 2-2
- power-on methods C-28
- preface xix
- preinstallation checklist 1-3
- primary console C-49
- privileged access password,
 - changing C-10
- privileged user menus C-6
- problem determination
 - using the stand-alone or online
 - diagnostics 8-1, 8-10
 - when unable to load
 - diagnostics 8-10
- processor and memory card cover
 - removal 4-9
 - replace 4-9
- processor card
 - install 4-20
 - removal 4-22
- product disposal xvii

progress indicators C-4, C-14
protecting the system 1-2

R

read system, POST errors C-5, C-15
reading the operator panel display 2-2
rear connector locations 1-11
reboot recovery C-25, C-29
records, device A-2
recycling xvii
related publications xix
remote latency C-24
remote timeout C-24
removal procedures
 adapters 4-25
 battery D-1
 covers 4-4
 disk drives 4-29
 media drives 4-34
 memory cards 4-13
 memory modules 4-18
 processor and memory cover 4-9
 processor card 4-22
replacement procedures
 battery D-3
 covers 4-36
 processor and memory cover 4-9
reset Service Processor C-11
reset switch 1-10, 2-2
restart recovery C-25, C-29
RETAIN C-24
retries C-24
ring indicator power-on C-13
run exercisers 6-30

S

safety considerations 4-1
safety notices xiii

SCSI port 1-11
seamless transfer of a modem
 session C-47
service aids 6-1
service center C-22
service director feature
 using 2-39
service mode
 service processor procedures C-41
service processor
service processor feature
 using 2-39
Service Processor menu inactivity C-3
service processor menus
 accessing locally C-3
 accessing remotely C-3
 call-in/call-out C-19
 call-out policy C-23
 customer account C-24
 general user C-4
 language selection C-18
 menu inactivity C-3
 privileged user C-6
 reboot policy C-25
 restart policy C-25
 serial port selection C-20
 serial port speed setup C-21
 setup menu C-8
 supported menu options C-2
 system information C-14
 system power control C-12
 telephone number C-21
service processor procedures in service
 mode C-41
service provider C-22
setting up 7043 Model 260 1-1
SP operational phases C-39
SSA service aids 6-36
standalone diagnostics 5-1

- start talk mode C-10
- starting the system unit 2-1
- STBY C-40
- stopping the system unit 2-1, 4-3
- surveillance
 - failure C-31
 - operating system C-31
 - set parameters C-11
 - system firmware C-31
- system administrator C-22
- system features 1-7
- system information menu C-14
- system management services
 - graphical system management services 3-1
 - config 3-4
 - multiboot 3-5
 - utilities 3-8
 - text-based system management services 3-23
 - display configuration 3-25
 - select language 3-38
 - utilities 3-29
- system phone number C-23
- system POST errors
 - read C-5
- system power-on methods C-28
- system records A-1
 - key serial number A-1
 - machine type/model A-1
 - serial number A-1
- system startup 1-1
- system unit
 - starting 2-1
 - stopping 2-1, 4-3
- system verification procedure 7-1

T

- tablet 1-11
- telephone line requirements for the United Kingdom xiii
- text-based system management services 3-23
- trademarks xix
- TTY terminal attributes required for diagnostics B-1
 - general B-1

U

- unattended start mode,
 - enable/disable C-12
- United Kingdom's telephone line requirements xiii
- unpacking the system unit 1-3
- update system flash 6-37
- using
 - system verification procedure 7-1
- using service director feature 2-39
- using service processor feature 2-39
- using the 12/24GB 4mm Tape Drive 2-28
- using the 3.5-inch diskette drive 2-9
- using the 8mm Tape Drive 2-21
- using the CD-ROM drive 2-11
- using the keyboards 2-3
- using the mouse 2-5

V

- voice phone number C-23

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Printed in U.S.A.

October 1998

