RS/6000
7012 Models 300 Series

Operator Guide

First Edition (October 1997)

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Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product will appear in their accompanying manuals.

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. 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.

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 A Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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 A respecte toutes les exigences du Réglement sur le matériel brouilleur du Canada.

Canadian Department of Communications Compliance Statement

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

電波障害自主規制　届出装置の記述

この装置は，第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

従って，住宅地域またはその隣接した地域で使用すると，ラジオ，テレビジョン受信機等に受信障害を与えることがあります。

取扱説明書に従って正しい取り扱いをしてください。

VCCI Statement

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

This equipment is in the Class 1 category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Control Council For Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in commercial and/or industrial areas.

Consequently, when used in a residential area or in an adjacent area thereto, radio interference may be caused to radios and TV receivers, etc.

Read the instructions for correct handling. VCCI–1.

Electromagnetic Interference (EMI) Statement – Taiwan

警告使用者：

這是甲類的資訊產品，在居住的環境中使用
時，可能會造成射頻干擾，在這種情況下，
使用者會被要求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user will be required to take adequate measures.

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 A. Für diese Klasse von Geräten gilt folgende Bestimmung nach dem EMVG:

Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministers für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind.

(Auszug aus dem EMVG vom 9.Nov.92, Para.3, Abs.4)

Hinweis:

Dieses Genehmigungsverfahren ist von der Deutschen Bundespost noch nicht veröffentlicht worden.

Safety Notices

Note: For a translation of these notices, see *System Unit Safety Information*.

Definitions of Safety Notices

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

Danger notices appear on the following pages:

8-1

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

Caution notices appear on the following pages:

xiii
8-1

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

Safety Notices for Installing, Relocating, or Servicing

For safety checks when relocating, refer to Chapter 8 "Moving the System Unit."

Lithium 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 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 the polarity.

Dispose of the battery according to local regulations.

Power Cables

Note: If you should need a different power cable, use this figure and the following table to assist you when ordering.
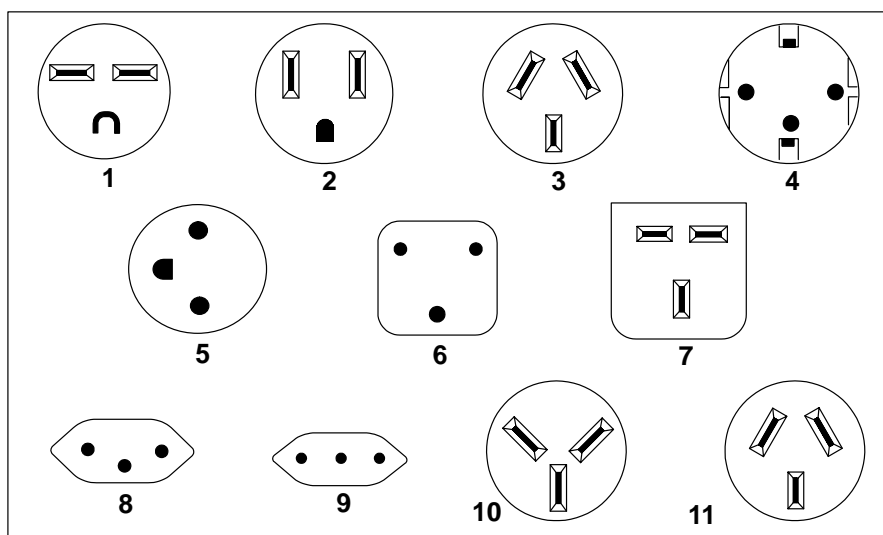
Index	Part Number	Country
1	1838574	Bahamas, Barbados, Bolivia, Brazil, Canada, Costa Rica, Dominican Republic, El Salvador, Ecuador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Netherlands Antilles, Panama, Peru, Philippines, Taiwan, Thailand, Trinidad, Tobago, U.S.A. (except Chicago), Venezuela
2	6952300	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Puerto Rico, Saudi Arabia, Suriname, Trinidad, Taiwan, U.S.A. (except Chicago), Venezuela
2	62X1045	Chicago, U.S.A.
3	6952311	Argentina, Australia, New Zealand
4	13F9979	Abu Dhabi, Austria, Belgium, Bulgaria, Botswana, Egypt, Finland, France, Germany, Greece, Iceland, Indonesia, Korea (South), Lebanon, Luxembourg, Macau, Netherlands, Norway, Portugal, Saudi Arabia, Spain, Sudan, Sweden, Turkey, Yugoslavia
5	13F9997	Denmark
6	14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka
7	14F0033	Bahrain, Bermuda, Brunei, Channel Islands, Cyprus, Ghana, Hong Kong, India, Iraq, Ireland, Jordan, Kenya, Kuwait, Malawi, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Arab Emirates (Dubai), United Kingdom, Zambia
8	14F0051	Liechtenstein, Switzerland
9	14F0069	Chile, Ethiopia, Italy
10	14F0087	Israel
11	6952291	Paraguay, Colombia, Uruguay

About This Book

This book uses three-digit model numbers. You may have other documentation that uses four-digit model numbers. For example, the model 32H in this book may be referred to as a model 320H in other documentation. They are the same system units.

This book provides information about the operator controls and the devices installed in the 7012 system unit.

Chapter 6 contains the hardware problem determination guide.

All information in this book pertaining to 7012 Model 397 also applies to 7030 Model 397.

Related Information

The *AIX Version 4 Problem Solving Guide and Reference, Order* Number SC23-2606, is the first book you should use when you have a problem with the system unit. It contains the procedure for determining if the problem is hardware or software related.

If the problem is software related, use the *AIX Version 4 Problem Solving Guide and Reference.*

The *Site and Hardware Planning Information* publication, Order Number SA38-0508 and the *Adapters, Devices, and Cable Information*, Order Number SA23-2764, contains information about various hardware and software offerings.

System Unit Safety Information, Order Number SA23-2652, contains translated versions of the danger and caution notices.

The *Diskless Workstation Management Guide*, Order Number SC23-2433, contains information about diskless workstations.

Chapter 1. System Unit Description

This chapter contains information to help you become familiar with the 7012 system unit.

Typical Workstation Arrangement

Your system unit may have a display, keyboard, and mouse attached to it, plus a wide range of other available options such as a tape drive, printers, data communications, terminals, and plotters.

An illustration of a typical system unit office arrangement follows:
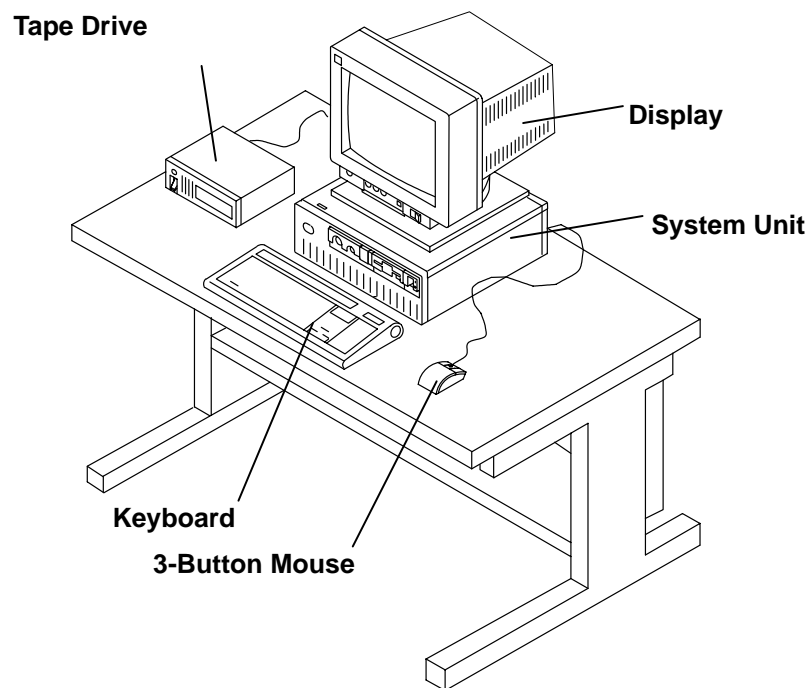
System Unit

The system unit processes data (input) from the keyboard, mouse, tablet, disk drives, diskettes, tape drives, and communications connections. It contains a 32-bit processor, input/output (I/O) adapters, memory, and media storage devices. The hardware is controlled by the operating system program.

Each model of the system unit has a standard memory size, but each can be configured with additional memory cards. See *Adapters, Devices, and Cable Information, Order* Number, SA23-2764 for details.

The system unit provides slots for the installation of Micro Channel adapters. Internal hardware controls the 3.5-inch diskette drive, speaker, two serial ports, one parallel port, mouse, keyboard, tablet, and disk drives.

Depending on the particular model, additional features could be present. For example:

- SCSI, Ethernet ports, or SCSI-2 SE port
- 16-bit SCSI cable instead of an 8-bit SCSI Bus Extender card
- Metal covers with a plastic front bezel
- No rear cover
- Capable of supporting two removable media bays
- Front cover with an operator-accessible front panel

System Unit Features

Logo
Is located on the front and rear covers. These logos can be rotated in place when the base position is changed.

Key Mode Switch
Is a key-controlled mode switch with three positions labeled:

- Normal (**OK**)
- Secure (🔒)
- Service (🔧)

Attention: Pressing the Reset button with the key mode switch in the Normal or Service position and the operating system running can result in damaged or lost data.

3-Digit Display
Displays up to three 7-segment characters. The display has a hinged lens through which the characters can be seen. The hinged lens allows access to the character holder, which can be turned 90 degrees for correct viewing when the system unit is in the horizontal or vertical position.

Diskette Drive
Contains a standard 1.44M-byte 3.5-inch diskette drive that has an in-use light and a diskette-eject button.

Power Switch
Has the international symbols (**I**) for On and (**O**) for Off. The Power switch also has a power-on light.

Base
Is removable and can be attached to the left side or the bottom for vertical or horizontal positioning of the system unit. See Chapter 7 for instructions.

Serial Number
Is located on the top cover (left-front corner) for easy access. It also is located on the rear bar code label.

Rear Cover
Is removable and provides access to the system unit connectors.

Top Cover
Can be removed by a service technician.

Front Cover
Can be removed by a service technician.

Rear Fan
Provides cooling for the electronics located inside the system unit.

Cable Guides
Provide a means to orderly arrange the cables between the system unit and external devices and power outlet.

Power Supply Fan
Provides cooling for the power supply. It is located inside the power supply.

Reset Button
Is located next to the 3-digit display and is labeled Reset.

Media Bays
The two media bays are optional.

System Illustration for Early Models

Logo
Front Cover
Base
Key Mode Switch
Reset Button
3-Digit Display
Diskette Drive
Diskette Eject Button
Power Switch

Rear Cover
Power Supply Fan
Logo
Cable Guides
Rear Fan
Base
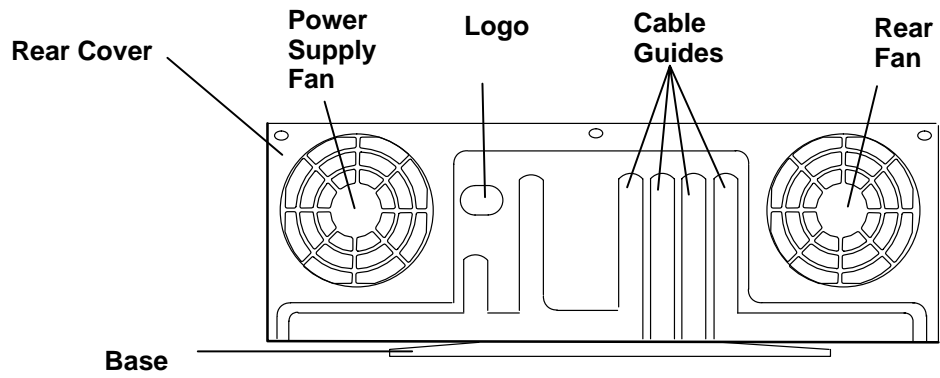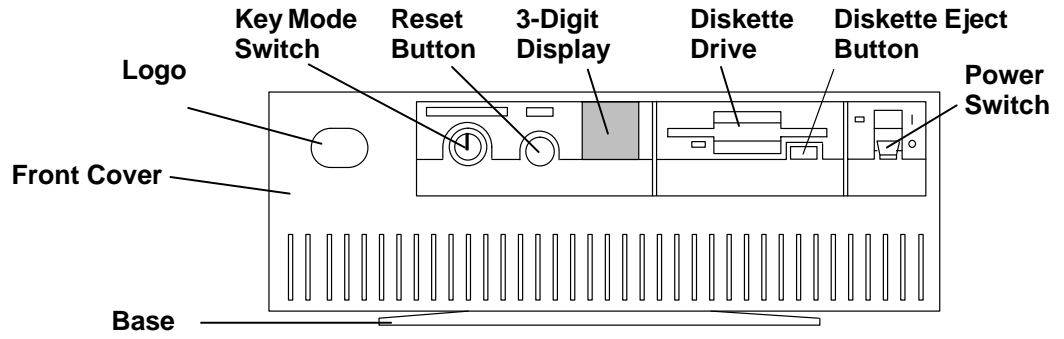
System Illustration for Models 380, 390, 39H, and 397

Power On LED   Diskette LED

Key Mode   Reset   3-Digit   Power   Diskette
Switch   Button   Display   Button   Drive

Logo   Diskette Eject
                                       Button

Front Cover

                                       Optional
                                       Media Bays

Base

Serial Number

Power   Ethernet

Adapter Positions

1 2 3 4

S 1   S2   P

Serial 1

                                    Tablet   Mouse
Serial 2   Parallel Port

SCSI-2 Port   Keyboard
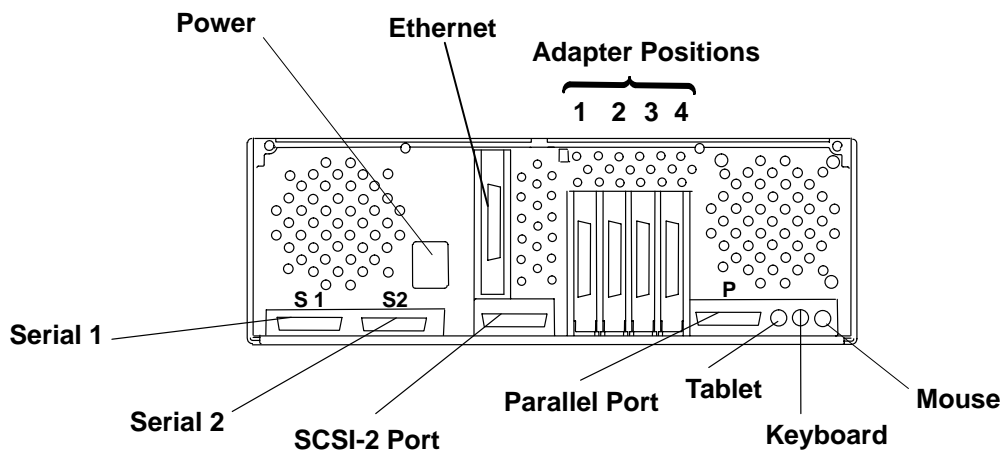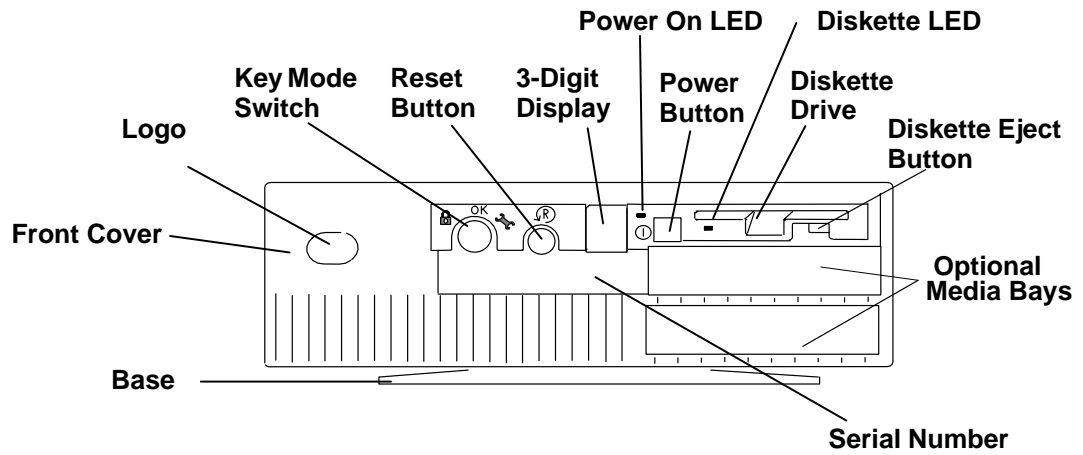
Base Positioning

In the typical workstation arrangement shown on page 1-1, the system unit is in the horizontal position. You can use the system unit in either the horizontal or vertical position as shown in this illustration. The unit has a removable base for stabilizing when the unit is in the vertical position. The base is attached to the bottom of the system unit when the system unit is in the horizontal position. See Chapter 7 for instructions on changing the base position.

Vertical Position

Horizontal Position
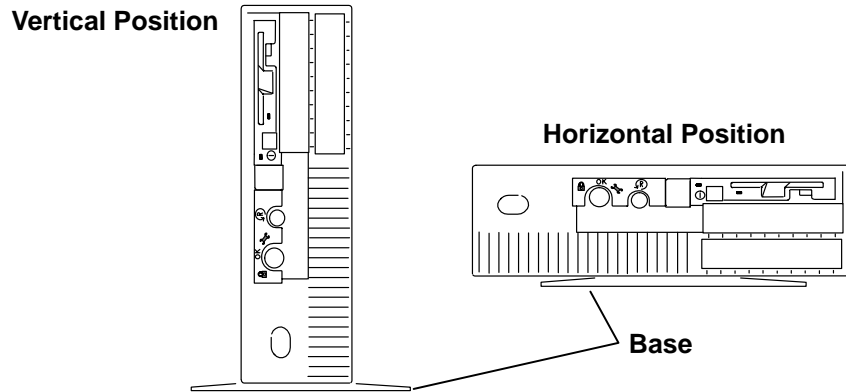
Base

Attention: Do not operate the system unit when it is on the side that does not have base screw mounting holes. This may result in damaged or lost data.

Disk Drives

The system unit has disk drive positions inside the system unit.There are no operator controls on these internal disk drives.

The disk is a permanent part of the drive and is sometimes called a *fixed-disk*.

Sometimes data is lost because of user action, accident, or equipment trouble, so you should back up disk data at regular intervals. See your operating system documentation for information about using diskettes or tape drives to back up files.

Disk Drive Positions
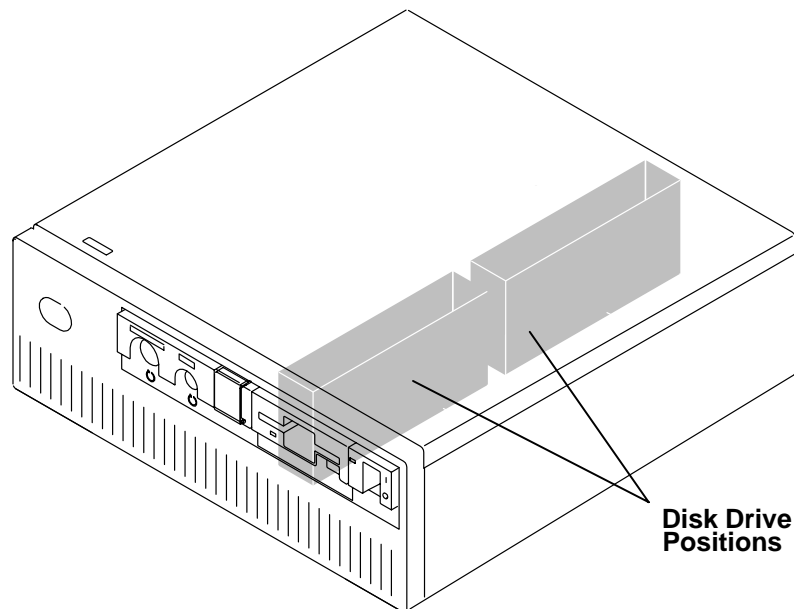
Rear Cover Removal and Replacement

Note: All 7012 models do not have rear covers. If your model does have a rear cover, use the following procedure for its removal and replacement.

Removal

1. Grip the lower-right and lower-left corners and tilt the bottom of the rear cover out about 30 degrees. Refer to the illustration.The cover retainers are located at the lower outside edges.

2. Pull the rear cover off.

Replacement

1. Attach the top edge of the rear cover.

2. Rotate the bottom of the rear cover to the front and push it into place.
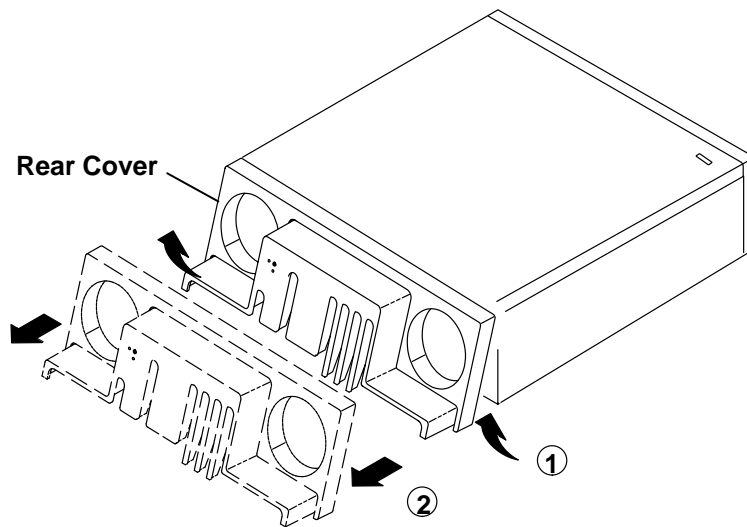
Rear Cover

External Device Connectors

When the rear cover is removed, the system unit connectors and ports are accessible. These connectors and ports, shown in the following illustrations, are used to attach external devices.

Note: For a translation of these notices, see System Unit Safety Information.

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 three-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.

DANGER

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

The rear of your system unit will resemble one of the following figures.

Models 320 and 32H

Power • Ethernet Connector • Adapter Positions • Parallel Port • Serial 1 • Serial 2 • Tablet • Keyboard • Mouse • Plate (not on all system units)
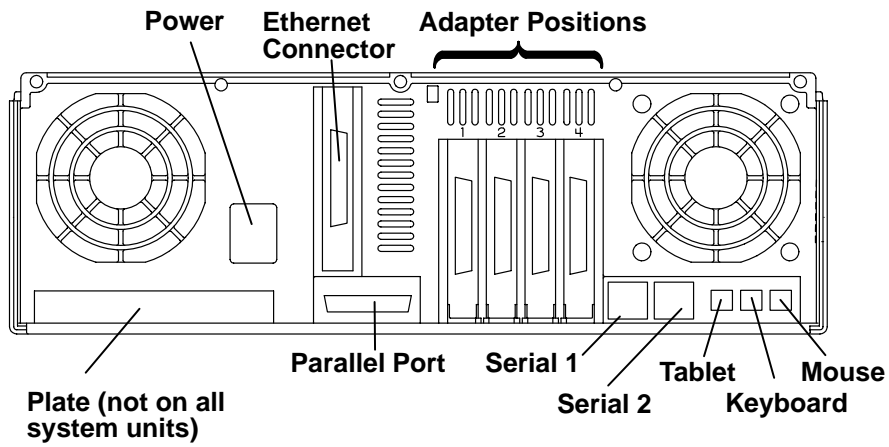
Models 340, 34H, 350, 355, 360/36T, 365, 370/37T, 375

Power • Ethernet Connector • Adapter Positions • Serial 1 • Serial 2 • SCSI Port • Parallel Port • Tablet • Keyboard • Mouse

Models 380, 390, 39H, and 397

Power • Ethernet Connector • Adapter Positions • S 1 • S2 • P • Serial 1 • Serial 2 • SCSI Port • Parallel Port • Tablet • Keyboard • Mouse
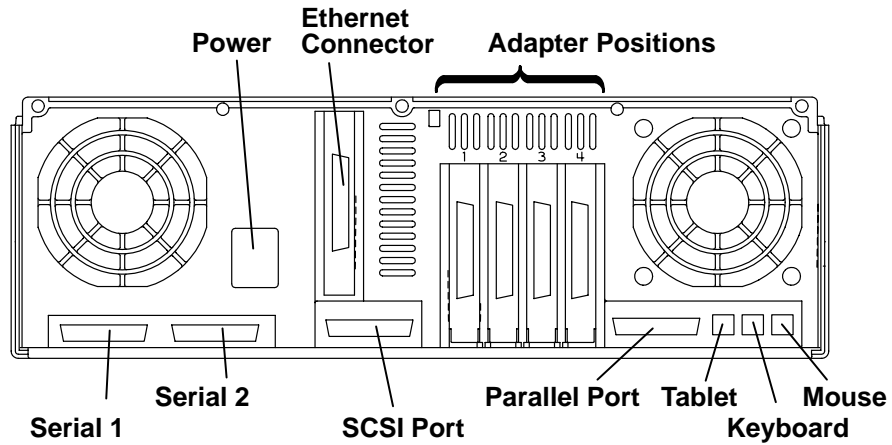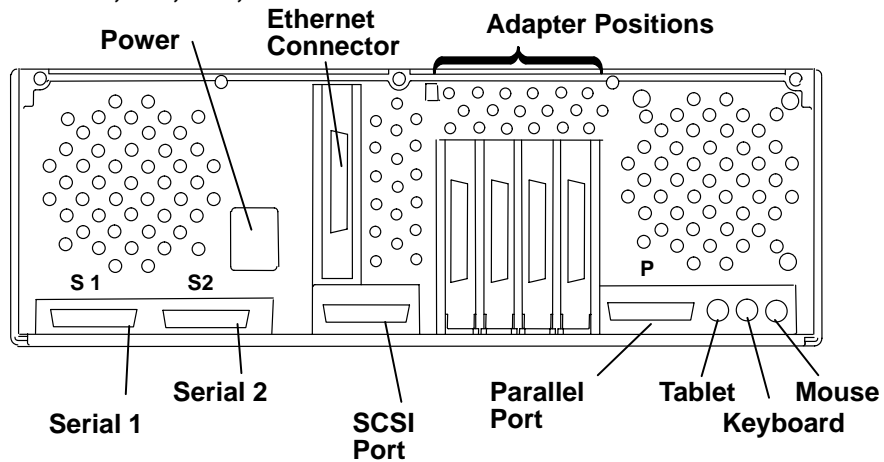
Location Codes

Because the same diagnostic programs are used on all of the system units, a location code is used to physically locate a failing device or unit. The location code is displayed along with the service request number (SRN) when the diagnostic programs isolate a failure. If the location code is not known, you can run the Display Previous Diagnostic Results service aid to display the results of the last time the diagnostic programs were run.

The rack-type system unit has several labels on the drawers and devices. These help the operator and service person identify various drawers and devices. The drawer ID should match the slot location of the adapter that drives it. The SCSI devices may be labeled with a number that identifies the SCSI address the device is set to. See Appendix A to determine the physical location of a device.

Location Code Format for 7135, and 9334

The location code formats for the 7135 and 9334 are described in the publications for the 7135 and 9334.

Location Code Format for Non-SCSI Devices

The following example is for non-SCSI devices. These include planars, memory cards, adapters, and async distribution boxes.

Use the example to determine the physical location of a device.

Note: The G and H fields each can contain one, two, or three characters.

AB - CD - EF - GH

Async port number or FRU location on a card or planar.

Connector number on an adapter or planar.

Slot number of the adapter, memory card, or adapter for the identified device.

Always 0 on workstations. Drawer ID or slot number of the adapter that drives the drawer in a rack-type system unit.

Always 0.
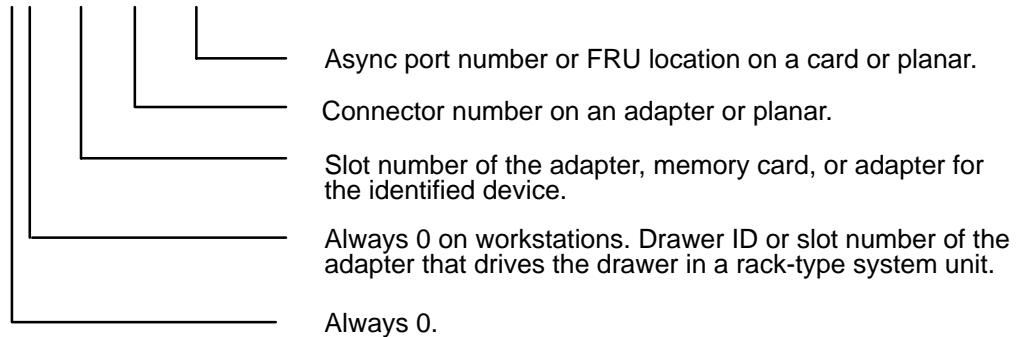
Location Code Format for SCSI Devices

Use Appendix A to determine the physical location of a SCSI device.

AB - CD - EF - GH

H is the logical unit number of the device.
HH is the logical unit number of the device shown in hexadecimal.
,HHH is the logical unit number of the device shown in decimal.

SCSI address of the device.

00 - Internal SCSI bus connector.
01 - External SCSI bus connector of a non-integrated
    SCSI controller.
0S - External bus connector of an integrated SCSI
    controller,

Slot number of the SCSI controller.
For the IBM 7012 direct bus attach disk drive, 7 is
the rear drive and 8 is the front drive.

Always 0.

Always 00.

To aid the operator and service person, the rack-type system unit has several identification labels on drawers and devices. The drawer ID should match the slot location of the adapter that drives it. SCSI devices may be labeled with a number that identifies the SCSI address to which the device is set.

Location Code Table

Use the following table to determine the physical location of a device or unit.

Note: The location code format for 9333 devices is described in the 9333 documentation.

Use the following example to identify the two-character pairs.

```
AB-CD-EF-GH
```

Pair	Value	Description
AB	00	Workstation-type system unit
CD	00	A device attached to the planar
	01 02 03 04 05	Adapter in slot 1 of the system board Adapter in slot 2 of the system board Adapter in slot 3 of the system board Adapter in slot 4 of the system board Adapter in slot 5 of the system board
	0J	Graphics adapter slot
	0A 0B 0C	CPU Card in slot A on the system board Memory Card in slot B on the system board Memory Card in slot C on the system board
EF	00	Does not have a connector or software was not able to identify the connector number
	01 02 03 04	The number of the connector on an adapter card, distribution box, or planar.
	0D 0E 0K 0M 0P 0S 0T	Internal diskette connector on the system board Built-in Ethernet adapter Keyboard connector on the system board Mouse connector on the system board Parallel printer connector on the system board Built-in SCSI adapter Tablet connector on the system board
	S1 S2	Serial port 1 connector on the system board Serial port 2 connector on the system board
(Continued on Next Page)		

Pair	Value	Description
GH or GHH or G,HHH	`00`	For devices other than those listed here

	`00`
	`thru`
	`15`
		Port addresses for 8-port async, 16-port async, and 16-port concentrator distribution boxes.

	`01`	Diskette drive 1
		Memory SIMM (J12) on the system board Memory SIMM (J13) on the system board Memory SIMM (J17) on the system board Memory SIMM (J18) on the system board

	`00`
	`thru`
	`FF`
		SCSI address and logical unit number of the device.

	`000`
	`thru`
	`FFF`
		SCSI address and logical unit number of the device shown in hexadecimal.

	`0,000`
	`thru`
	`F,255`
		SCSI address and logical unit number of the device shown in decimal.
		Note: When a comma appears between the G and H, digits appearing to the right of the comma are represented in decimal.

	Note: See the Appendix A to determine physical location.	

Chapter 2. Using the System Unit

This chapter explains how to use the operator panel and other devices for control, input, display, and data storage in the 7012 system unit.

Ergonomic Information

Once you have setup your system, we encourage you to visit the Healthy Computing web site. Good ergonomic practice is important to get the most from your workstation and to avoid discomfort. This means that the equipment and the workplace should be arranged to suit your individual needs and the kind of work you do.

This web site gives ergonomic guidelines to help you understand the ergonomic considerations that you should know about in working at a computer workstation. The address is:

```
http://www.us.pc.ibm.com/healthycomputing
```

Setting the Key Mode Switch

The key-controlled mode switch has three positions:

- Normal (**OK**)
- Secure (🔒)
- Service (🔧)

The switch is used to establish the initial program load (IPL) path. The IPL loads the system programs, checks the system hardware, and prepares the system for user operation.

Before starting the system unit for normal day-to-day operation, set the key mode switch to the Normal position. This permits the operating system to load after the power-on self-tests (POSTs) are completed.

Model 32x
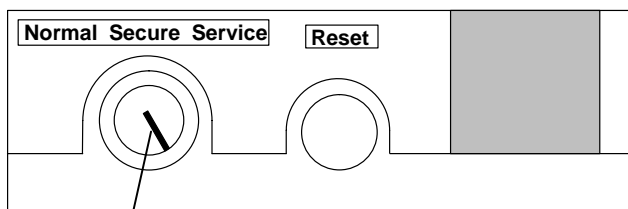
Key Mode Switch Shown in the Normal Position

Models 380, 390, 39H, and 397
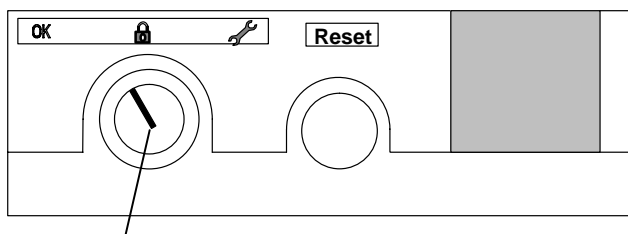
Key Mode Switch Shown in the Normal Position

All other models
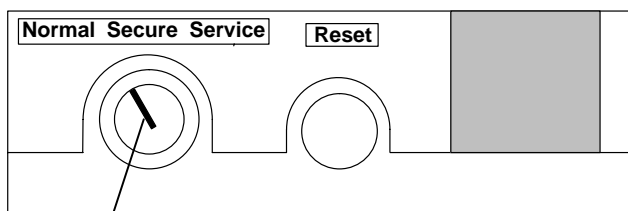
Key Mode Switch Shown in the Normal Position

The following table summarizes the operations possible for each key mode switch position:

Operation	Key Mode Switch Position		
	Normal	Secure	Service
Reset	Yes	No	Yes
Keyboard Active	Yes	Yes	Yes
Keyboard Debug/Dump/Loading Operating System	No	No	Yes
Normal IPL	Yes	No	No
Service IPL	No	No	Yes
Covers Locked	Yes	Yes	No

- The Normal position is used for attended operation, which is the usual or normal placement of the key mode switch when an operator is present and in control of the operation at the system unit. The Reset button is active. The IPL proceeds according to the list of devices established during the configuration of the operating system.

  Note: If an operating system has never been installed, use the Service position for initial installation.

  Attention: Pressing the Reset button (when the mode switch is in the Normal or Service position) can cause data to be damaged or lost if the operating system is still running. For a description of the Reset button operation, see the *AIX Version 4 Problem Solving Guide and Reference* before pressing it while the key mode switch is in the Normal position.

- The Secure position is used for unattended operation in an open environment. For example, the system unit can be used for process control in a manufacturing area where an operator, responsible for the system operation, is not located in the immediate area.

  In the Secure position, the Reset button is not active. The Secure position prevents any IPL. With the key mode switch in this position, someone cannot accidentally press the Reset button and cause a loss of data.

  Notes:

  1. If you start the system unit while the key mode switch is in the Secure position, the IPL of the system unit stops and the 3-digit display displays `200`. The system does not perform any further operations until the key mode switch is set to the Normal or Service position.

  2. When the key mode switch is moved to the Secure position after IPL, all system functions continue to operate to allow data entry and retrieval.

- The Service position is used for attended operation when hardware or software service is conducted. The Service position activates operating system keyboard sequences that support error determination (debug) and storage printout (dump). In the Service position, the system unit attempts to perform an IPL from the diskette drive. If a diskette is not present in the diskette drive or if there is no IPL record on the diskette, the system attempts to perform an IPL from the predetermined list of IPL devices.

  Note: If the 3-digit display displays `200`, pressing the Reset button within 20 seconds will cause the Main Menu to display.

Attention: The Reset button is active when the key mode switch is in the Normal or Service position, and pressing the Reset button can cause data to be damaged or lost if the operating system is still running.

If there is a problem with the system unit, refer to the *AIX Version 4 Problem Solving Guide and Reference* before setting the key mode switch in the Service position or pressing the Reset button.

Starting the System Unit

The front of your system unit will look like one of the following illustrations.

See this illustration for starting the system unit.
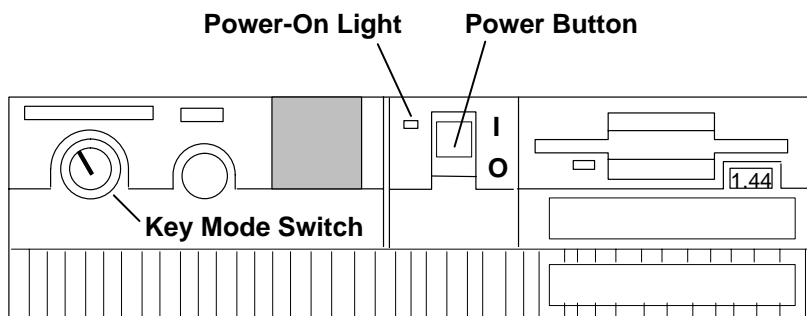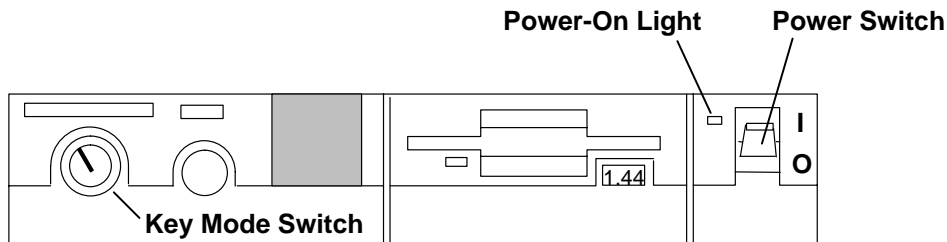
1. Set the key mode switch to the Normal position.

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

3. Start the system unit by setting the power switch to On (**I**).

4. If power-on light does not come on when you set the power switch to On, ensure that the power cord, located at the back of the system unit, is plugged into a grounded electrical wall outlet. If this does not solve the problem, refer to the *AIX Version 4 Problem Solving Guide and Reference.*

When you set the power switch to On, the power-on light comes on and the system starts a power-on self-test (POST).

During POST, numbers are displayed in the 3-digit display.

Stopping the System Unit

Attention: When using the shutdown procedure for your system, enter the correct command before you stop the system unit. Failure to do so may result in the loss of data. If you need information on the shutdown procedure for your operating system, see the shutdown procedure in your operating system information.

1. Before stopping the system unit, you must first perform a shutdown procedure of the operating system to prevent the loss of data.
2. After you shut down the operating system, set the power switches of the attached devices to Off.
3. Stop the system unit by setting the power switch to Off (**O**).
4. Set the key mode switch to the Secure position and remove the key.

Operating with Multiple Attached Systems

When you are operating a system that is attached to one or more other systems, consider how actions you take with your system can affect the attached systems, and how other systems can affect yours. Consult with the operator of an attached system whenever you think your operations might affect each other.

The following actions can affect or be affected by the operation of an attached system:

*   Starting and stopping the system
*   Starting and stopping communication with the other system
*   Running diagnostics on the system
*   Using wrap plugs with diagnostic programs
*   Analyzing error log information.

Isolate a system unit from any attached systems before stopping the operating system or running diagnostic programs. Some system cabling changes (such as installing wrap plugs or removing a device from the configuration) may require action by the operator of the attached system before you make the cabling changes on your system.

Ordering Keys

For protection against unauthorized key duplication, the key mode switch is equipped with a Medeco® high security lock. Keys for this lock are a factory restricted series, and duplicate keys are not available through normal commercial channels. The metal code tag supplied with your original keys authorizes you to purchase additional keys directly from the Medeco factory. The additional key supplied and the metal tag should be stored in a secured area.

To obtain information or replacement keys, use the following list to contact the Medeco distributor most convenient to you. Complete a copy of the order form on the next page and mail it to the distributor. As a security precaution, Medeco will not honor orders that do not include both the code tag and the official order form.

Should the key mode switch become inoperative, contact your sales representative for replacement.

Code Tag
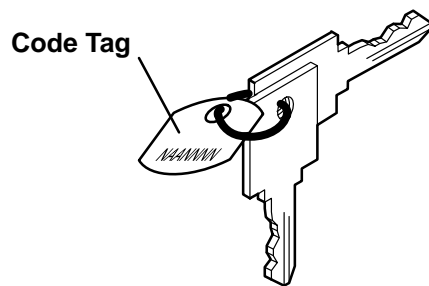
USA

Medeco
Department KLC
P.O. Box 3075
Salem, VA 24153
United States of America

Australia

Neville Burr
ATM Lock A Safe Co. Pty. Ltd.
2/48 Ourimbah Road, P. O. Box 300
Tweed Head, N.S.W. 2485
Australia
Tel: 011–61–075–36–1611
Fax: 011–61–075–36–1611

Europe

Claus Clausen
89a Authur Road
Wimbledon Park, London
SW 19 7DP England
Tel: 011–44–81–946–2823
Fax: 011–44–81–946–2286

Latin America

Ricardo DeCastro
Calle 22 No 3-30, Ofc. 201
P. O. Box A.A. No. 39955
Bogota, Colombia Sur America
Tel: 011–57–1–268–5827 or 6180
Fax: 011–57–1–268–2628

Far East

Sung Kim
Geoho Corporation
P. O. Box 519
Kwang Chan Bldg. 4th Floor
983–42 Bangbia-Dong
Seocho-Ku, Seoul
Korea
Tel: 011–82–02–521–2100
Fax: 011–82–02–521–2106

Middle East

Moshe Rotner
R. M. Rotan Marketing
34 Nordau Street, Herzlia B
P. O. Box 5138, Herzlia
Israel
Tel: 011–972–52–504622
Fax: 011–972–52–582357

Key Reorder Form

A copy of this form, when accompanied by the metal code tag supplied with the original keys, represents an authorized order for additional factory keys.

Please indicate the quantity required and enclose a check or money order for the appropriate amount.

Number of keys required_____

Please Type or Print Your Return Address

Name_____

Address_____

City_____

State_____Zip_____

Country_____

Select an address from the list provided on the previous page, and mail a copy of this form to that location.

Your key code tag will be returned with your new keys.

Note: No orders will be processed without both the key tag and a copy of this form.

Reading the Three-Digit Display

Attention: If you have a continuous flashing `888` in the three-digit display,this illustration,do not push the Reset button until you read "Reading Flashing 888 Numbers" on page NO TAG or obtain a Problem Reporting Form from the *AIX Version 4 Problem Solving Guide and Reference.*

The three-digit display on the operator panel 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.
- Display diagnostic program messages when the display console is not working correctly.

During POST, the numbers that are displayed indicate the progress of the testing. If an error is detected that requires attention, the system unit halts and a number is displayed in the three-digit display to identify the error.

For instance, if the number for the error were `888`, the three-digit display would appear as shown in the following figure.

The front of your system unit will look like one of the following illustrations.

Three-Digit Display
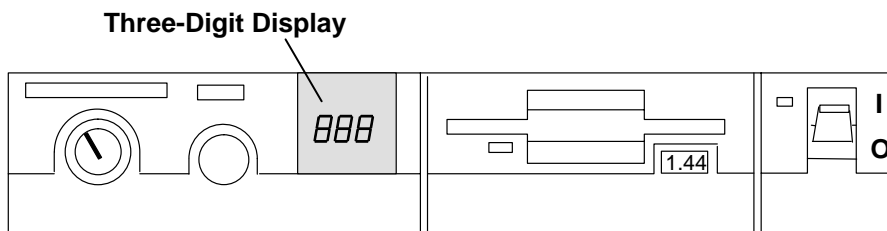
When the self-tests complete without error, the three-digit display screen is blank.

Three-Digit Display
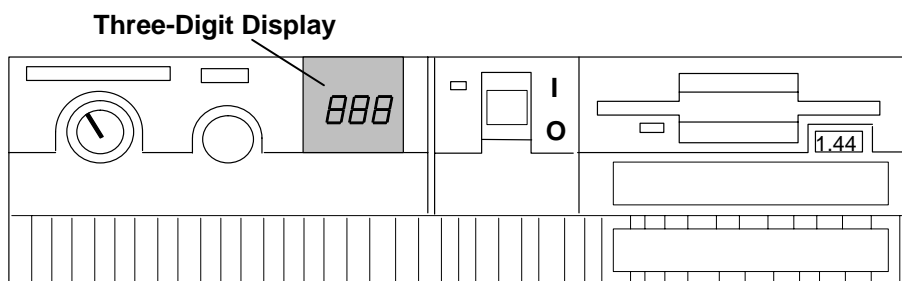
Using the Reset Button

Attention: When the key mode switch is in the Normal or Service position, pressing the Reset button causes the unit to reset and perform an IPL. Pressing the Reset button while the operating system is running can result in damaged or lost data.

The Reset button has four purposes:

- To cause an IPL of the system when the key mode switch is in the Normal or Service position.

- To read out codes or diagnostic messages after a continuous flashing `888` is displayed in the three-digit display.

- To access the Main Menu.

- On models 340, 350, 355, 360/36T, 365, 370/37T and 375 only, to cause the Main Menu to display when the button is pressed within 20 seconds after IPL begins.

Note: Before pressing the Reset button in this situation, refer to "System Problem Determination" in the *AIX Version 4 Problem Solving Guide and Reference*.

When the key mode switch is in the Secure position, the Reset button is disabled and you cannot perform an IPL by pushing the Reset button.

The front of your system unit will look like one of the following illustrations.

Reset Button
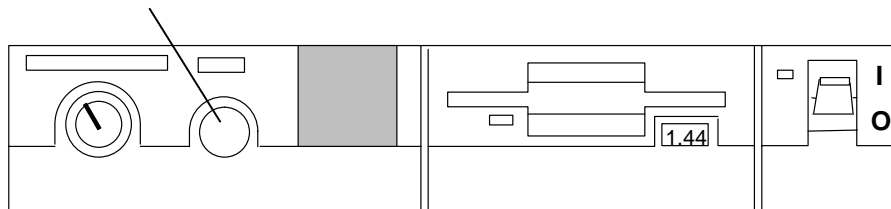
Reset Button
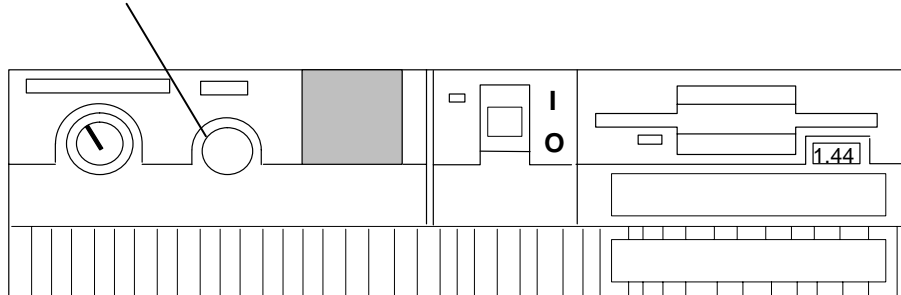
Using the Keyboards

There are several keyboards available with 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.

Function Keys

Typewriter Keys   **Control Keys**   **Numeric Keypad**
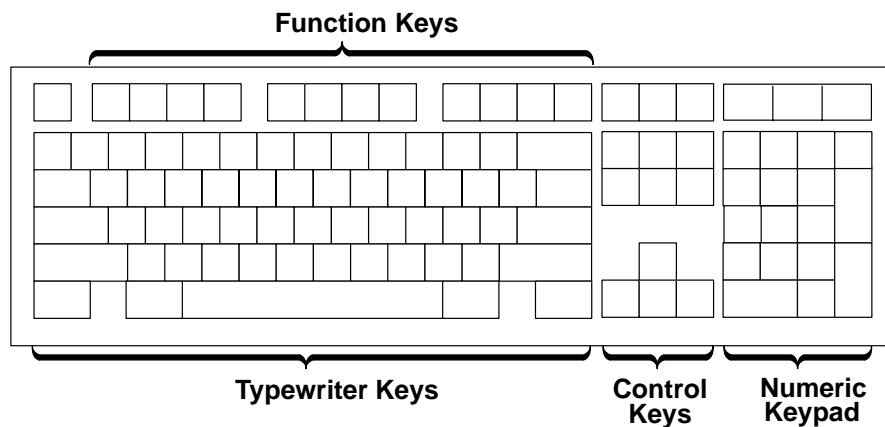
The keyboard is divided into four sections:

- The function keys are multipurpose keys and their function is controlled by the operating system.

- The typewriter keys are similar to a standard typewriter. Their function is controlled by the software.

- The control keys move the cursor on the screen and do programmed control functions. The movement and functions depend upon the application used.

- The 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 connector, labeled "K" or "Keyboard," at the rear of the system unit.

Keyboard Leg
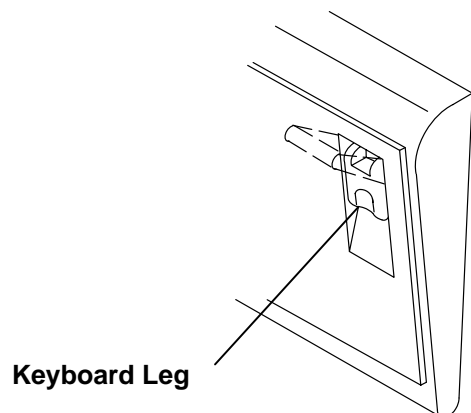
Using the Three-Button Mouse

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.
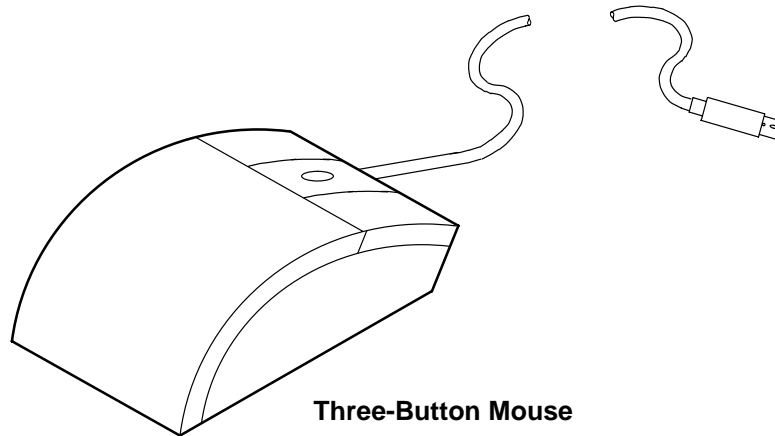
Three-Button Mouse

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,this illustration, the cursor moves on the display screen; the movement changes the position of the cursor.
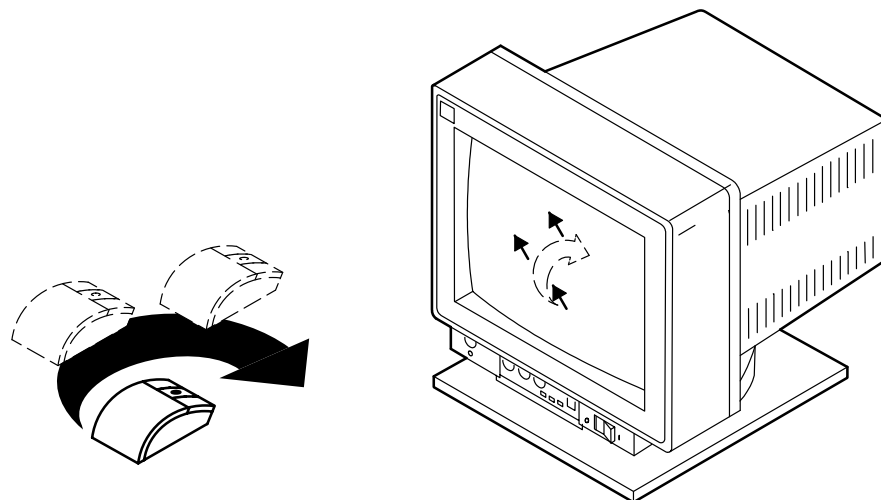
With the mouse buttons, you can perform functions such as selecting and deselecting options, extending your selection, or choosing a command. The precise function of your mouse depends on the software you are using.

The mouse has a cable that plugs into a connector, labeled M or Mouse, 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 felt pads located on the bottom of the mouse to prematurely wear. A deeply pitted surface could cause erratic operation of the mouse.

Remember to:

- 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 arrows as shown in the following illustration.
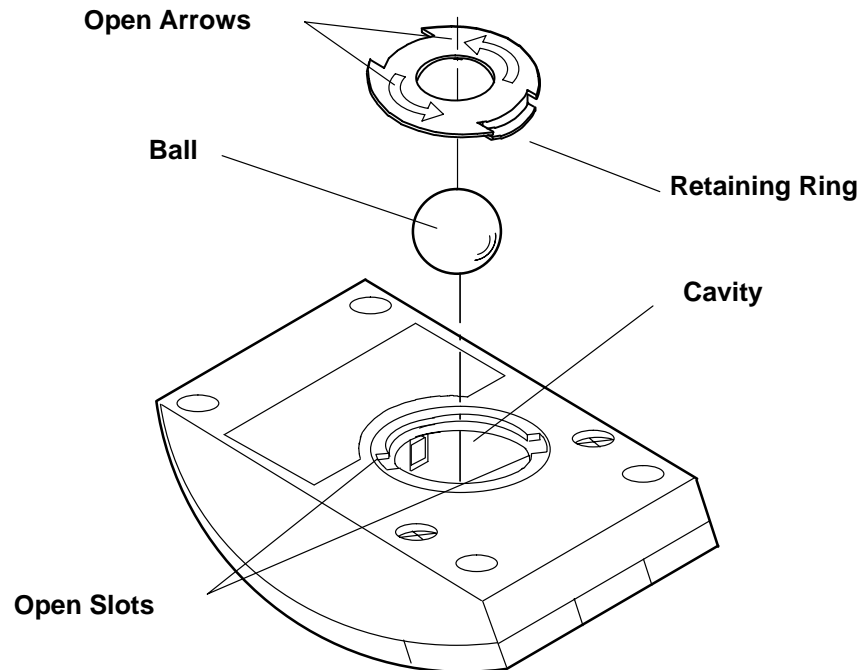
2. Remove the ball.

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

The in-use light is on when the system is accessing the drive. The number 1.44 is printed on the diskette-unload button, as shown in the following illustration.

Do not stop the system unit or remove a diskette when the in-use light is on, or you may lose some of the data on the diskette.

The front of your system unit will look like one of the following illustrations.

3.5-Inch Diskette Drive

In-Use Light   **Diskette-Unload Button**

3.5-Inch Diskette Drive

In-Use Light   **Diskette-Unload Button**
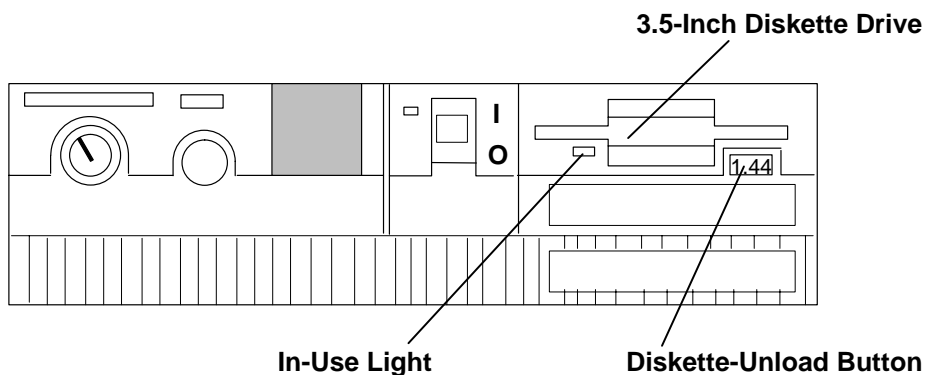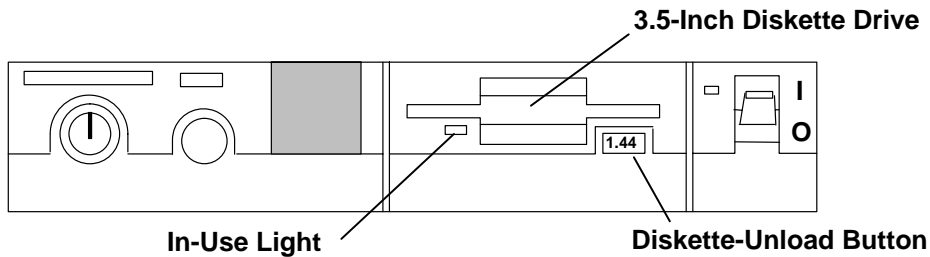
Handling Your Diskettes

Be careful with your diskettes. Because each piece of information occupies such a small area on the diskette, small scratches, dust, food, or tobacco particles can make the information unusable. Be sure to remember the following:

- Do not touch the recording surfaces.

- Keep diskettes away from magnets and magnetic field sources such as telephones, dictation equipment, and electronic calculators.

- Keep diskettes away from extreme heat and cold. The recommended temperature range is 10°C to 60°C (50°F to 140°F).

- Proper care helps prevent loss of information.

- Make backup copies of your diskettes regularly.

Types of 3.5-Inch Diskettes

Attention: Diskette drives and diskettes must be the correct type to store data successfully. If you use the wrong diskette in your 3.5-inch diskette drive, the data on the diskette may be destroyed.

The diskette drive uses the following 3.5-inch diskettes:

- 1.0M-byte capacity, which stores approximately 720K bytes of data.

- 2.0M-byte capacity, which stores approximately 1.44M bytes of data.

A 1M-byte diskette looks like this:

May be labeled 2HC ———— **Sliding Metal Shutter**

Write-Protect Slot ————

A 2M-byte diskette looks like this:

———— **Sliding Metal Shutter**

Write-Protect Slot ———— **Rectangular Cutout**
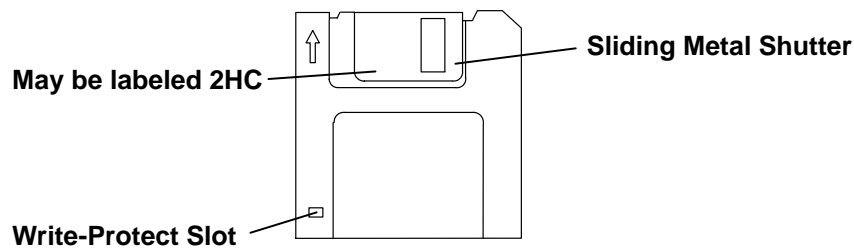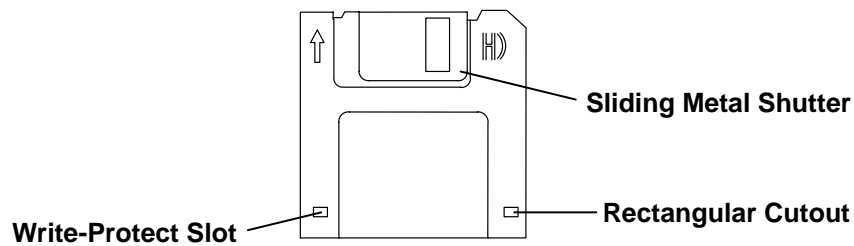
Note: Some computers operate with 720K-byte diskette drives (no printing on the diskette-eject button) that use only 1.0M-byte capacity diskettes. If you are going to be transferring work between computers that have different diskette drives, be certain the diskettes are compatible and are formatted correctly. For more information, refer to your operating system information.

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.

**Diskette Write-Protected
(Read Only):**

Rear View

(Slot Open)
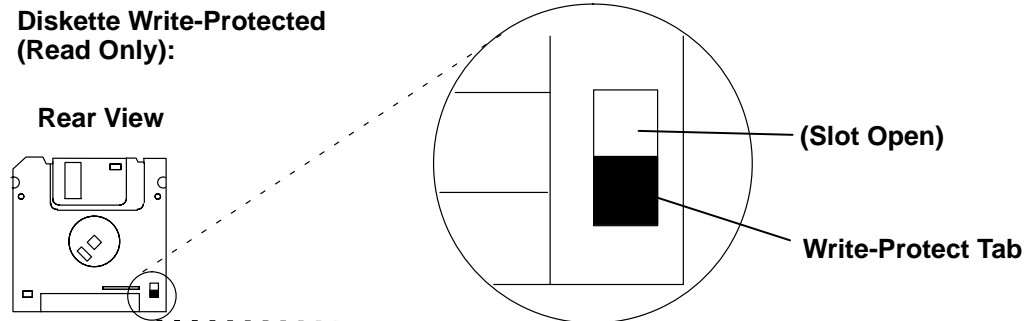
Write-Protect Tab

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

**Diskette Not Write-Protected
(Read or Write):**

Rear View

(Slot Closed)

Write-Protect Tab
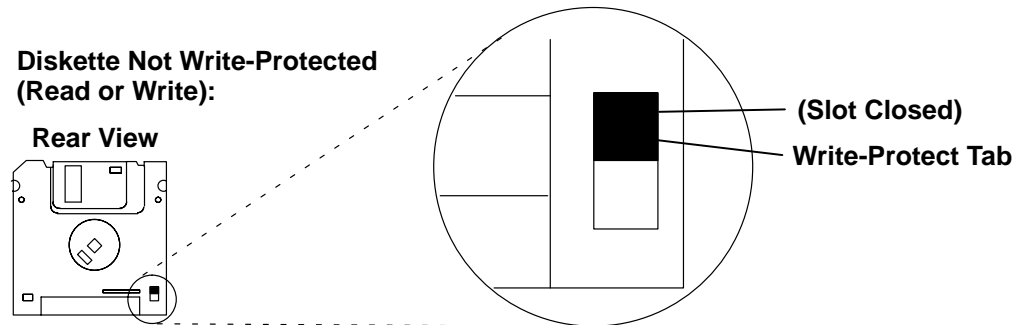
Loading and Unloading the 3.5-Inch Diskette

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

The front of your system unit will look like one of the following illustrations.

Labeled Metal Shutter
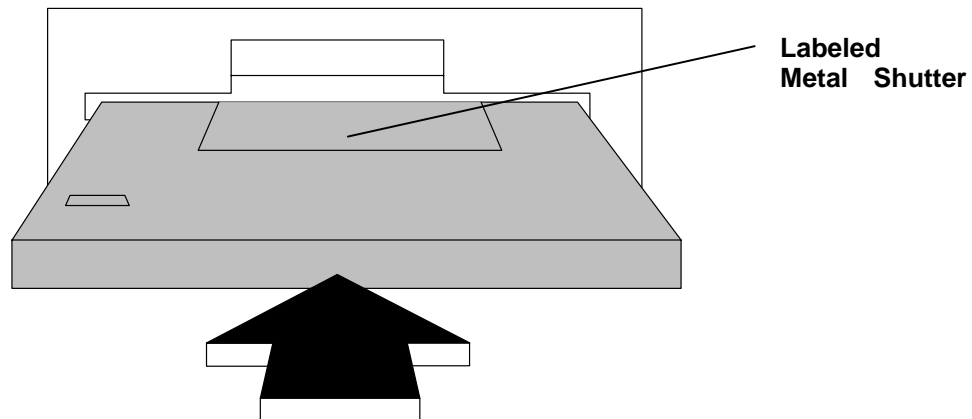
To unload the diskette, push the diskette-unload button. The diskette unloads partially from the drive. Pull the diskette out.

1.44

Diskette-Unload Button
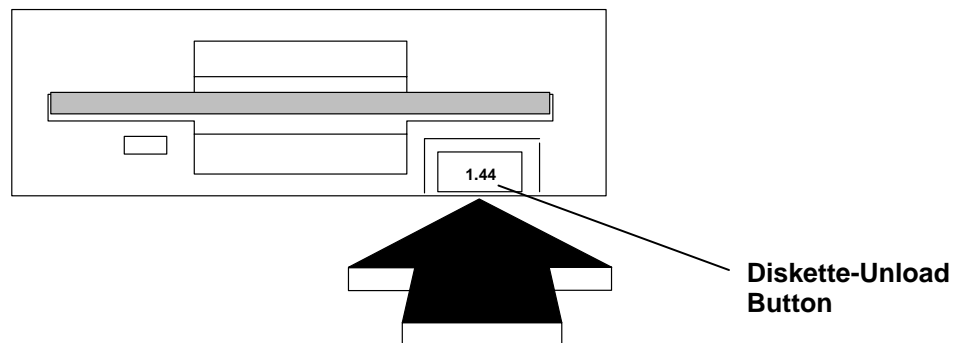
Using the CD-ROM Drive

The CD-ROM drive position is located in either of the optional media positions.

Type B Bezel (CD-ROM and CD-ROM2) CD-ROM Drive

Note: For a translation of this notice, see *System Unit Safety Information*.

CAUTION:
A Class 3 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.

Type B Bezel (CD-ROM and CD-ROM2):
                Unload Button
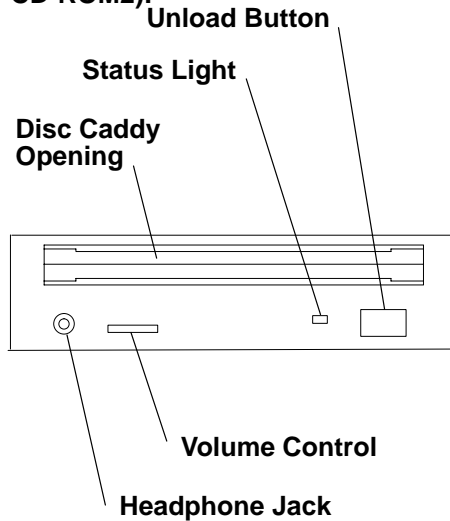
Status Light

Disc Caddy Opening

Volume Control

Headphone Jack

The front panel of the drive has an unload button, status light, volume control, headphone jack, and a disc caddy opening.

When the CD-ROM is set to On, the status light indicates one of several conditions. The following are status light states and the respective conditions of the CD-ROM drive:

- Off during standby with the caddy loaded or unloaded.
- Blinks when the caddy is inserted and until completion of initialization.
- Blinks *slowly* when either the lens or disc is dusty (lens should be cleaned by running the cleaning device).
- Blinks fast when in the audio mode.
- Lights during data transfer operations.
- Lights steady when:
  - No disc is in the caddy.
  - The disc is in the caddy upside down.
  - Some condition exists that should be checked. If this occurs, contact your service representative.

Loading the CD-ROM Disc Caddy

Note: The disc caddy is not compatible with the Type C bezel CD-ROM drive.

The CD-ROM media kit contains a CD-ROM diagnostic disc and a disc caddy.

Open the disc caddy and place the CD-ROM disc in the caddy with the printed side up.
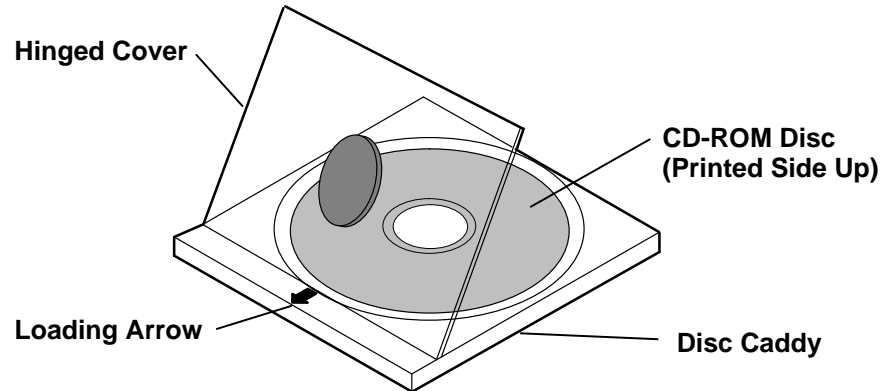
Insert the disc caddy into the disc caddy opening with the loading arrow towards the CD-ROM drive and the printed side of the disc up. Push gently on the caddy. The drive automatically pulls the caddy into the drive and prepares the disc for reading.
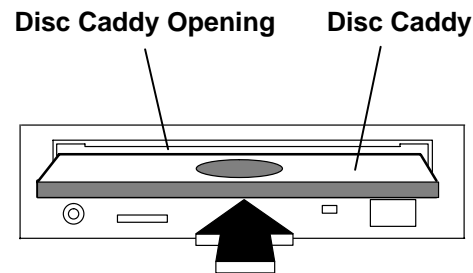
Unloading the CD-ROM Disc Caddy

Push and hold the unload button until the caddy unloads. The CD-ROM drive partially ejects the caddy from the drive opening. Pull the caddy out of the drive.

Note: The unload button must be pushed and held for a minimum of 2 seconds before the caddy unloads.
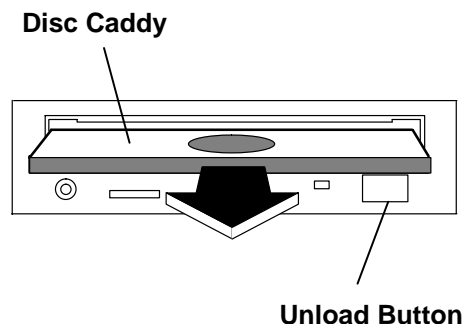
If the disc caddy cannot unload and has to be removed manually from the drive, contact your service representative.

Cleaning the CD-ROM Drive

The CD-ROM drive has an internal cleaning mechanism and does not require an external lens cleaning device.

Type C Bezel CD-ROM Drive

Note: For a translation of this notice, see *System Unit Safety Information*.

CAUTION:
A Class 3 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.

Type C Bezel
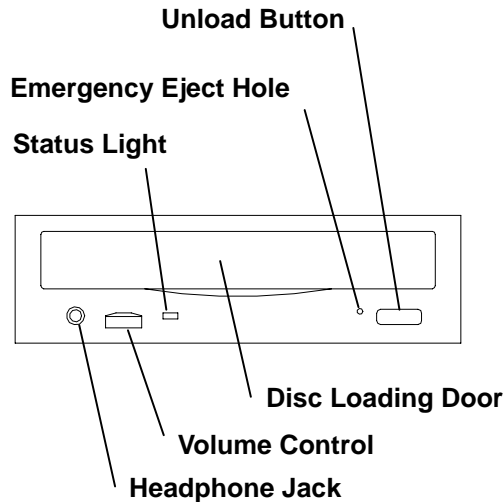
Unload Button

Emergency Eject Hole

Status Light

Disc Loading Door

Volume Control

Headphone Jack

The front panel of the drive has an unload button, status light, volume control, headphone jack, and a disc loading door.

When the CD-ROM is set to On, the status light indicates one of several conditions. The following are status light states and the respective conditions of the CD-ROM drive:

- Off during standby.
- Blinks until completion of initialization.
- Blinks *slowly* when either the lens or disc is dusty (lens should be cleaned by running the cleaning device).
- Blinks fast when in the audio mode.
- Lights during data transfer operations.
- Lights steady when:
    - No disc is in the drive.
    - The disc is in the drive upside down.
    - Some condition exists that should be checked. If this occurs, contact your service representative.

Loading the CD-ROM Drive
Notes:

The disc caddy is not compatible with the Type C bezel CD-ROM drive.

Always handle discs by the edges to avoid leaving fingerprints. Discs can be wiped with a soft, lint-free cloth or lens tissue. Always wipe in a straight line from the inner hub to the outer rim.

1. Press the unload button to open the loading drawer.

Unload Button
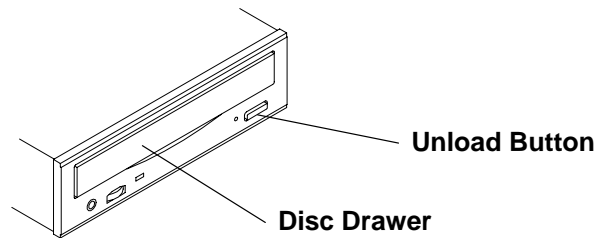
Disc Drawer

2. With the printed side facing upward, place the disc in the disc drawer. Push gently on the front of the disc drawer. The drive automatically pulls the disc drawer into the drive and prepares the disc for reading.

Disc Tray

**CD-ROM Disc
(Printed Side Up)**

Disc Drawer
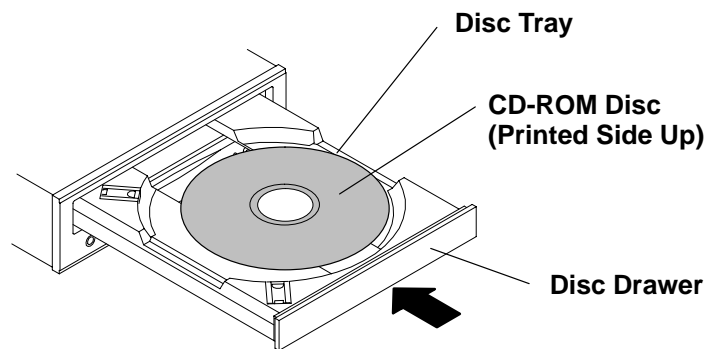
Unloading the CD-ROM Drive

Note: Always handle discs by the edges to avoid leaving fingerprints. Discs can be wiped with a soft, lint-free cloth or lens tissue. Always wipe in a straight line from the inner hub to the outer rim.

1. Push and hold the unload button until the disc drawer comes out. The drive partially ejects the disc drawer. Pull the disc drawer out until it stops.

Note: The unload button must be pushed and held for a minimum of two seconds before the disc drawer is partially ejected.

Unload Button
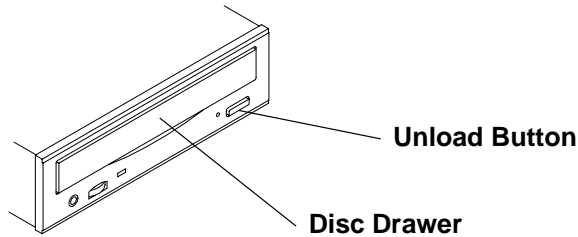
Disc Drawer

2. Wait until the disc drawer ejects out of the drive and stops, and then remove the CD-ROM disc.

CD-ROM Disc

Disc Drawer
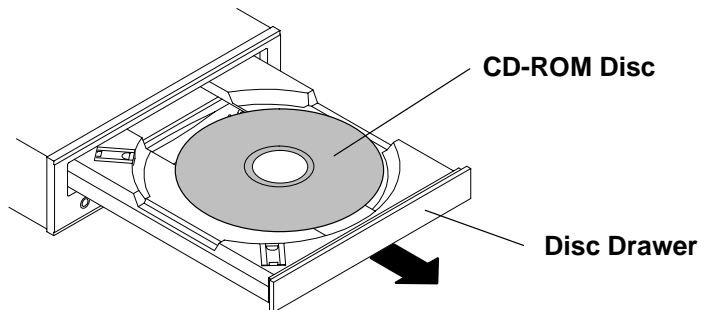
If the disc cannot unload and has to be removed manually from the drive, refer to "Emergency Eject" on page 2-23. If the disc still does not unload after trying the emergency eject procedure, contact your service representative.

Emergency Eject

Note: Execute the following procedure only when the disc drawer will not eject after the unload button is pressed.

1. Power-off the CD-ROM drive.

2. Insert a straight metal small-diameter rod such as a straightened paper clip into the emergency eject hole as shown in the figure.

3. Pull the disc drawer out.
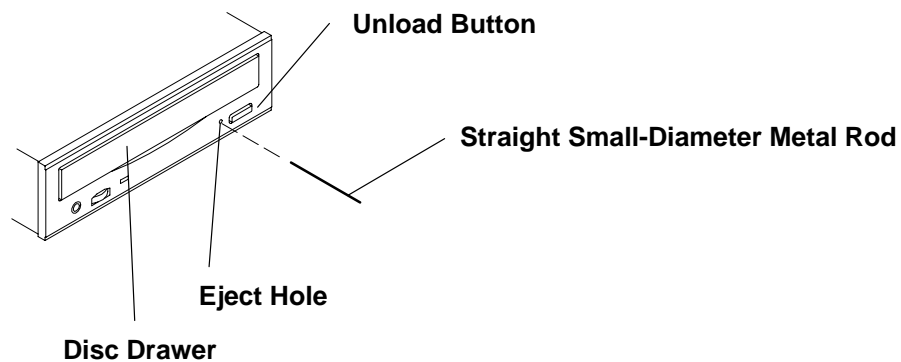
Unload Button

Straight Small-Diameter Metal Rod

Eject Hole

Disc Drawer

Cleaning the CD-ROM Drive

The CD-ROM drive has an internal cleaning mechanism and does not require an external lens cleaning device. The internal cleaning mechanism cleans the head every time a disc is inserted into the disc drawer.

Chapter 3. Using the Standalone and Online Diagnostics

Sources for the Diagnostic Programs

The diagnostics consist of Standalone Diagnostics and Online Diagnostics. Standalone 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 (referred to as service mode), run in maintenance mode (referred to as maintenance mode), or run concurrently (referred to as concurrent mode) with other applications. They have access to the AIX Error Log and the AIX Configuration Data.

Standalone and Online Diagnostics Operating Considerations

Consider the following before using the diagnostic programs:

- The following devices are not supported on Version 4.1 and higher of diagnostics:
  - 8–bit and 24–bit 3D color graphics adapter (FFC 876 and 879)
  - M–Video Capture adapter (FFC 985)
  - M–Video Capture and Playback adapter (FFC 977)
  - Async expansion adapter and drawer (FFC 867 and 288)
  - T1/J1 Portmaster Adapter/A (FFC 851)
  - E1 Portmaster Adapter/A (FFC C18)
- Support for the following adapters has been withdrawn beginning with AIX version 4.3.
  - POWER GtO Grahpics Adapter (FFC B50, B51, B52, B53, C12, C13, C14)
  - POWER Gt1 Graphics Adapter (FFC 880, B34, B35, B42)
  - POWER Gt1x Graphics Adapter (FFC 880, B34, B35, B42)
  - Network Terminal Accelerator Adapter,256 (FFC 838)
  - Network Terminal Accelerator Adapter,2048 (FFC 838)
- Some supplemental diagnostic diskettes are incompatible with version 4.1 or later diagnostics and will not work when used with version 4.1 CD–ROM or tape based diagnostics.
  To test these devices use an earlier version of either the diskette diagnostics or the CD–ROM based diagnostics.

- Run Online Diagnostics in Service Mode when possible, unless otherwise directed. The Online Diagnostics perform additional functions, compared to Standalone Diagnostics. This ensures that the error state of the system is captured in NVRAM for your use in fixing the problem. The AIX error log and SMIT are only available when diagnostics are run from the disk drive.
- When running Online Diagnostics, device support for some devices may not have been installed. If this is the case, that device will not appear in the resource list.
- When running Standalone Diagnostics, device support for some devices may be contained on supplemental diagnostic media. If this is the case, the device will 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.

Diagnostics on a System Unit Attached to Another System

If your system unit is attached to another system using a network or directly attached to the channel of another system, see "General Information About Multiple Systems" on page 3-15 before running any diagnostic procedures.

Selecting a Console Display

When you run diagnostics from diskettes, from a CD–ROM disc and, under some conditions, when you run them from disk, you need to select the console display. The diagnostic programs display `c31` in the operator panel display and display instructions on any direct–attached displays and the terminal attached to S1 port.

If `c31` is displayed, follow the instructions to select the console display. If you do not have a console display, set the key mode switch to Normal and then back to Service. This signals the diagnostic programs to use the operator panel display for instructions.

Identifying the Terminal Type to the Diagnostic Programs

Note: This is a different function than selecting a console display.

When you run diagnostics, the AIX operating system 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 :xph.hft:exph. for adapter–attached displays. This option sets the TERM environment variable in the AIX operating system.

Undefined Terminal Types

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

Resetting the Terminal

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

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

Running Diagnostic Programs From Tape Drives

To load and execute diagnostics from a tape drive perform the following:

1. Turn on the tape drive if it is an externally attached device.
2. Set the key mode switch to the Service position, then turn on the system unit.
3. Remove any tape currently in the tape drive.

4. Insert the diagnostic programs tape into the tape drive. Close the tape drive's door if applicable.

Running Diagnostic Programs from CD–ROM

Consider the following when you run diagnostic programs from the CD–ROM disc:

- The diagnostic disc must remain in the CD–ROM drive for the entire time 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 turned off and then turned on (standalone mode) or after the diagnostics program has terminated (concurrent mode). The disc must be ejected prior 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.

- Diagnostics from CD–ROM are not supported on systems with less than 16MB of installed memory.

To run diagnostics from a CD–ROM drive, do the following:

1. Remove any diskette from the diskette drive.

2. Turn on the CD–ROM drive if it is an externally attached device.

3. Load the diagnostic disc into the CD–ROM drive.

4. If you have a graphics adapter installed in the system that is supported only on a supplemental diagnostic diskette, insert that diskette into the diskette drive.

5. Set the key mode switch to the Service position.

6. Turn on the system unit.

Running the Diagnostic Programs from Diskettes

Consider the following when you run the diagnostic programs from diskettes:

- The diagnostic diskettes are labeled as to the devices and functions the diskettes contain. The following diskettes must be inserted in the order shown before the DIAGNOSTIC OPERATING INSTRUCTIONS will be displayed.

    1. Boot diskette

    2. Configuration diskette

    3. Graphics diskette (optional if the system does not contain a graphics adapter)

    4. Console Definition diskette.

- There are two different Boot diskettes, one for use in systems containing 8M bytes of memory and one for use in systems containing a minimum of 16M bytes of memory. Only one diskette can be loaded.

    Note: When using the 8M–byte boot diskette only the following devices/adapters may be tested:

    – Base system (floating point, memory, I/O planar)
    – Keyboard
    – Async adapters
    – Media devices

- Graphic adapters
- SCSI adapters

All other devices/adapters will not appear on the test list. The devices listed above will only show on the test list if they are normally supported in an 8M–byte system.

- There are several different graphics diskettes for configuring and testing graphics adapters. Use only the graphics diskettes for the type of graphics adapters installed in the system. For each type of graphics adapter installed in a system, you must load the graphics diskette which supports that adapter in order to test it.

  The diskette containing the graphics adapter that will be used as the console for running diagnostics should be loaded first. If there are other graphics adapter types installed in the system, load the diskette supporting those adapters immediately following the first graphics diskette.

- If a device installed in a system is not supported by one of the diskettes shipped with the system, check for the existence of a supplemental diagnostic diskette shipped with the device.

- After the DIAGNOSTIC OPERATING INSTRUCTIONS are displayed, follow the displayed instructions in order to test the device or to run a Service Aid.

- The diagnostic programs shipped on diskettes with the system unit have a version number on the label. The *Common Diagnostics and Service Guide* also has a version number on the cover which should match the first two version number digits of the diskettes in order for diagnostics to work correctly. You can check the version of the diagnostic programs on the Diagnostic Operating Instructions.

- When you load the diagnostic programs from diskettes, you may get the following messages on the operator panel display or on the console display:

  `c01` Insert the first diagnostic diskette
  `c02` Diskettes inserted out of sequence
  `c03` The wrong diskette is in the diskette drive
  `c05` A diskette error occurred
  `c07` Insert the next diagnostic diskette
  `c09` Diskette is being read or written
  `c31` Select the console display.

Running the Diskette Diagnostics From a Non–RS232 Terminal

Version 1.3 and later versions of the Diagnostic Diskette package allows a terminal attached to any RS232 or RS–422 adapter to be selected as a console device. The default device is an RS232 tty attached to the first standard serial port (S1). However, the console device may be changed by editing the :xph./etc/consdef:exph. file that is provided on Diagnostic Diskette 4. The file format follows:

```
#
# This is the console definition file used to describe the terminal
# device to be used as the console. It is in the form
# attribute=value, one per line. The location is the location code
# seen when listing devices using lsdev. Spaces must not be entered
# around the = sign.
#
# Remove the # signs from the first column of each line to take
# effect. The location must be specified for any attribute in
# this file to be processed.
#
# For example, to define the console device as an rs232 terminal on
# port S1:
#
#connection=rs232
#location=00-00-S1
#speed=9600
#bpc=8
#stops=1
#xon=yes
#parity=non#term=3163
```

To change this file, take the following steps:

1. Enter:

   ```
   cd /tmp
   mkdir diag4
   cd diag4
   ```

2. Insert Diagnostics Diskette 4 into the diskette drive.

3. Enter the following:

   ```
   cpio -iuvmdC36 </dev/rfd0
   cd etc
   ```

4. To edit the file, do the following:

   a. Enter `uncompress consdef`

   b. Edit the `consdef` file to work with your configuration

   c. Enter `compress consdef`.

5. Enter the following:

   ```
   cd /tmp/diag4
   find . -type f -print | cpio -ouvmC36 > /dev/rfd0
   ```

6. Use the new Diagnostics Diskette 4 with the new configuration.

SCSI Subsystem Diagnostic Diskette Package Version 3.0

The SCSI Subsystem Diagnostic Diskette Package Version 3.0 consists of six 1.44 diagnostic diskettes and provides a SCSI Subsystem Diagnostic package. The purpose of this package is to diagnose problems that prevent booting from a SCSI device and to support maintenance of SCSI devices.

OEM SCSI devices are no longer referred to as 'Other SCSI Device', they are still prefixed with the 'SCSI' acronym, but now name the specific SCSI device (ie. SCSI Disk, SCSI Tape etc.).

Note: Default diagnostic and format parameters are used for OEM SCSI devices. No other diagnostic or service aid support is included.

The Diagnostic Diskette Package contains the following:

- tty console support

- graphics console support for all Micro Channel graphics adapters and local bus graphics adapters

- diagnostic support for all current Micro Channel SCSI adapters, SCSI disks, SCSI tapes, and SCSI CD–ROMs.

- SCSI Bus Service Aid

- Microcode Download Service Aid

- Service Hints Service Aid

- Diskette Media Service Aid

- Disk Media Service Aid (format, certify, and erase)

- Display/Alter Bootlist Service Aid

Diagnostic Diskette Contents and Descriptions

The following information describes the contents of each diskette:

- Diskette 1 is the Boot Diskette.

- Diskette 2 is the Configuration Diskette

- Diskette 3A contains console support for the following:

  - Color Graphics Display Adapter

  - Grayscale Graphics Display Adapter

  - POWER Gt1 Graphics Adapter

  - POWER Gt1x Graphics Adapter

  - POWER GXT100 Graphics Adapter

  - POWER GXT150 Graphics Adapter

  - POWER GXT150M Graphics Adapter

  - POWER GXT150L Graphics Adapter

  - POWER Gt3 Graphics Subsystem

  - POWER Gt3i Graphics Subsystem

  - POWER Gt4 8–Bit Graphics Subsystem

  - POWER Gt4 24–Bit Graphics Subsystem

  - POWER Gt4e Graphics Subsystem

  - POWER Gt4x 8–Bit Graphics Subsystem

  - POWER Gt4x 24–Bit Graphics Subsystem

  - POWER Gt4i 24–Bit Graphics Subsystem

  - POWER Gt4xi 8–Bit Graphics Subsystem

  - POWER Gt4xi 24–Bit Graphics Subsystem

- Diskette 3B contains console support for the following:
  - High Performance 8–Bit 3D Color Graphics Processor
  - High Performance 24–Bit 3D Graphics Processor
  - POWER GXT1000 Graphics Subsystem
  - Graphics Subsystem Adapter
- Diskette 4 is the Console Configuration Diskette
- Diskette 5 contains Diagnostic Applications for the following:
  - SCSI Internal/External I/O Controller
  - SCSI–2 Fast/Wide Adapter/A
  - Wide SCSI I/O Controller
  - CDROM Drive
  - 3.5 Inch Diskette Drive
  - 5.25 Inch Diskette Drive
  - 1/4–Inch Cartridge Tape Drive
  - 2.3 GB 8mm Tape Drive
  - 5 GB 8mm Tape Drive
  - 5 GB 8mm DE Tape Drive
  - 4mm Tape Drive
  - 9–Track Tape Drive
  - 1/2–Inch 3490E C10,C11,C22 Tape Drive
  - 160 MB SCSI Disk Drive
  - 200 MB SCSI Disk Drive
  - 320 MB and 400 MB SCSI Disk Drives
  - 120 MB Direct Bus Attach Disk
  - 160 MB Direct Bus Attach Disk
  - 355 MB and 670 MB SCSI Disk Drives
  - 540 MB SCSI Disk Drive
  - 857 MB SCSI Disk Drive
  - 1.0 GB SCSI Disk Drive
  - 1.0 GB SCSI DE Disk Drive
  - 1.0 GB 16 Bit SCSI DE Disk Drive
  - 1.37 GB SCSI Disk Drive
  - 2.0 GB SCSI Disk Drive
  - 2.0 GB SCSI DE Disk Drive
  - 2.0 GB 16 Bit SCSI DE Disk Drive
  - 2.0 GB 16 Bit SCSI Disk Drive

- 2.4 GB SCSI Disk Drive (2 1.2 GB each)
- 1.1 GB 8–Bit Single–Ended Disk Drive
- 1.1 GB 16–Bit Single–Ended Disk Drive
- 1.1 GB 16–Bit Differential Disk Drive
- 2.2 GB 8–Bit Single–Ended Disk Drive
- 2.2 GB 16–Bit Single–Ended Disk Drive
- 2.2 GB 16–Bit Differential Disk Drive
- 4.5 GB 16–Bit Single–Ended Disk Drive
- 4.5 GB 16–Bit Differential Disk Drive
- 600 MB Double Speed Tray Loading CD–ROM
- 7134 High Density SCSI disk subsystem
- 8mm 7GB tape drive
- 600 MB Quad Speed Tray loading CD–ROM
- Enhanced SCSI–2 Differential Fast/Wide Adapter/A
- High Performance Disk Drive Subsystem
- Format/Certify Disk Drive Service Aid
- Serial Disk Trace Service Aid
- SCSI Bus Service Aid
- Diskette Media Service Aid
- Alter Bootlist Service Aid

In addition to the above diskettes, there may be supplemental diskettes that contain the Diagnostic Applications for other resources.

Diskettes 1, 2, and 4 are required for booting. If a graphics adapter is available as a console, then diskettes 3A and/or 3B depending on the display adapter(s) are used.

The sequence of diskettes therefore may be:

- 1, 2, 4 no graphics displays

- 1, 2, 3A, 4 select display adapter whose support code is located on diskette 3A as the system console.

- 1, 2, 3A, 3B, 4 select display adapter whose support code is located on diskette 3A or diskette 3B as the system console.

- 1, 2, 3B, 3A, 4 select display adapter whose support code is located on diskette 3A or diskette 3B as the system console.

Running the Diagnostic Programs from Disk or From a Server

Consider the following when you run the diagnostic programs from a disk:

- The diagnostics cannot be loaded and run from a disk until the AIX operating system has been installed and configured. After the **installp** command is used to install and configure 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. When the system is set up to IPL from a server, the diagnostics are executed in the same manner as they were from disk.

- If the diagnostics were loaded from disk or a server, you must shutdown the AIX operating system before turning 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 standalone mode, press the F3 key until `DIAGNOSTIC OPERATING INSTRUCTIONS` displays; then press the F3 key once again 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 c31 may appear in the operator panel display, with instructions displayed on attached displays and terminals. Follow the instructions to select a console display or set the key mode switch to Normal and back to Service if you do not have a console display.

Running the Diagnostic Programs from the Network

Consider the following when you run the diagnostic programs from a network:

- Diagnostics cannot be loaded and run from the network until AIX Version 3.2 or higher has been installed and configured on the server.

- Your system unit must be configured to receive IPL (initial program load) over the network or the server must be setup to send a service mode IPL of the diagnostics.

To run the diagnostic programs from the network:

- Enter the **shutdown –F** command to shut down the operating system.

- Turn the key mode switch to the Service position.

- Turn off the system unit, wait 30 seconds, then turn on the system unit.

Running the Diagnostic Programs with a 5080 Attached

Consider the following when you run the diagnostic programs on a system attached to a 5080 system:

- When the system unit is attached to a 5085 or 5086 system, the DIAGNOSTIC OPERATING INSTRUCTIONS are not displayed on the monitor attached to the 5085 or 5086 . See the *5080 Graphics System Installation, Operation, and Problem Determination* for information about operating the combination system.

- After turning on the system unit, the keyboard initially belongs to the graphics processor. Keyboard control can be switched to the system within two minutes of turning on the system unit by pressing and holding the Alt key and then pressing the Sw Keybd key.

Attention: Do not attach the 5085 or 5086 keyboard to the system unit without the special diagnostic cable.

- There is a special diagnostic cable available with the combination system to attach the 5085/5086 keyboard directly to the system unit. See the *5080 Graphics System Installation, Operation, and Problem Determination* manual for information setting the combination system up.

Running the Diagnostic Programs from a TTY Terminal

Consider the following when you run diagnostic programs 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 diagnostic programs. 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 diagnostic programs present display information through the S1 port, certain attributes are used. These attributes are set as if the diagnostic programs were using a 3161 display terminal. Refer to the tables in *Adapters, Devices, and Cable Information* 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 *Adapters, Devices, and Cable Information* 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

To run the Online Diagnostics in Service Mode, take the following steps:

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

2. Turn off the system unit.

3. Set the key mode switch to the Service position.

   Note: When the diagnostic programs are run from a source other than the network of from the disk the diagnostics *do not* check the error log entries.

4. Turn on the system unit.

   Note: If while the diagnostics are loading, some system units stop with 260, 261, or 262 displayed in the operator panel display and the console display is blank, press the 1 (one) key on the console keyboard to cause the diagnostics to continue to load.

5. After the diagnostic controller loads, DIAGNOSTIC OPERATING INSTRUCTIONS appear on the console display.

   If the system unit *does not* have a console display, the diagnostics run automatically and loop on the diagnostic test until the system unit is turned off.

6. If a problem is detected while the diagnostics are loading, a flashing 888 displays in the operator panel display. See "Appendix B. Three-Digit Display Numbers" on page B-1 for instructions on reading the message.

7. Follow the displayed instructions to checkout the desired resources.

8. When testing is complete; use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS.

9. If you loaded the diagnostics from the disk, 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 will produce 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

- Some display adapters

- 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*.

Standalone Diagnostic Operation

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

Error Log Analysis is not done by the Standalone Diagnostics.

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

Running the Standalone Diagnostics

To run the Standalone Diagnostics, take the following steps:

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

2. Turn off the system unit.

3. Set the key mode switch to the Service position.

4. If you want to load the standalone diagnostics from diskette, insert the first diagnostic diskette into the diskette drive.

5. If you want to load the standalone diagnostics from a CD–ROM disc, insert the CD–ROM diagnostic disc into the CD–ROM drive.

6. If you want to load the standalone diagnostics from tape, insert the diagnostic tape into the tape drive.

7. Turn on the system unit.

   Note: If while the diagnostics are loading, some system units stop with 260, 261, or 262 displayed in the operator panel display and the console display is blank, press the 1 (one) key on the console keyboard to cause the diagnostics to continue to load.

8. After the diagnostic controller loads, DIAGNOSTIC OPERATING INSTRUCTIONS appear on the console display.

   If the system unit *does not* have a console display, the diagnostics run automatically and loop on the diagnostic test until the system unit is turned off.

   When the diagnostics are run from diskette, a c07 is displayed when the test have completed.

9. If a problem is detected while the diagnostics are loading, a flashing 888 displays in the operator panel display. See "Appendix B. Three-Digit Display Numbers" on page B-1 for instructions on reading the message.

10. Follow the displayed instructions to checkout the desired resources.

11. When testing is complete; use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS.

12. Turn off the system unit after the shutdown is complete.

System Exerciser

Note: Beginning with AIX version 4.2 the System Exerciser will no longer be supported.

The System Exerciser tests and exercises devices in an overlap mode and can only be run from disk in standalone or maintenance mode.

Starting the System Exerciser

When the System Exerciser is selected from the FUNCTION SELECTION menu, another menu displays all devices to be tested. Pressing the Enter key starts tests for all of the devices.

The time required to test all of the devices depends on the number of devices to be tested and can range from several minutes to approximately one hour for a fully loaded system. Because some devices require less time to test than others, the number of times a device is tested under the System Exercise may be one or more.

Note: If the system contains tape devices, CD–ROM, or diskette drives, you will be asked whether you want to use media in the devices when you are testing.

Display Screens

If the console is a graphics display, normal test patterns are displayed during the tests. After the graphics adapter test is finished, the standby screen is displayed.

If the console is an async terminal, the standby screen will be displayed during testing. The time–of–day will be displayed at the top of the screen and is updated approximately every minute.

After all devices have been tested at least once, a results screen will be displayed until either the Enter key is pressed to restart the System Exerciser or the Exerciser is stopped. If no errors were detected, the results screen displays the `No trouble found` message; if errors have been detected, the results screen displays a list of devices with corresponding errors.

Stopping the System Exerciser

Although the System Exerciser can be stopped at any time, it is best to stop it while the results screen is displayed. Stopping the Exerciser at other times can cause the loss of test information.

When the System Exerciser is stopped, the screen displays all tested devices with errors flagged. Selecting a device that has an error flag provides details such as SRN, location code, number of times the device was tested, and the number of times an error was detected.

Using the System Exerciser to Check Out Repairs and Intermittent Problems

The System Exerciser can be used to check out the system following repairs and to identify intermittent problems.

When the System Exerciser is running, most built–in error recovery procedures are turned off. This can cause occasional errors to be reported that normally have no effect on system operation. Parts should only be replaced when the following occurs:

- A high number of errors are reported in relation to the number of times the device was tested.

- Errors reported by the System Exerciser are in the same area as that reported by the customer.

General Information About Multiple Systems

This chapter presents guideline information for anyone needing to run the diagnostic programs on a system unit that is attached to another system. These guidelines are intended for both the operator of the system and the service representative.

This guideline is presented by adapter type or by system configuration type.

These considerations and actions are not detailed step–by–step instructions, but are used to ensure that you have considered the attached system before you run diagnostics on this system unit.

You are directed to the detailed procedures for the various activities as needed.

These guidelines generally present considerations for the following:

- Starting and stopping the communications with the other system.
- Considerations before running diagnostics on the system.
- Analyzing the error log information.
- Using the wrap plugs with the diagnostics.

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

Determining System Architecture

Some of the tasks and service aids are system model architecture (platform) restricted. If tasks or service aids will be needed to complete servicing your system, it may be necessary to know which platform your system is utilizing.

This manual deals with the following platforms:

- RS6K (Risc System 6000 Platform)
- RS6KSMP (Risc System 6000 Symmetric Multiprocessor Platform)

Note: Some of the tasks and service aids in this manual may be identified as being RS6K or RS6KSMP only. Assume the service aid can be accessed on either platform unless a note stating the task or service aid is RS6K or RS6KSMP only is present.

To find out the platform on which you are working, enter one of the following commands.

If you are running AIX 4.2.1 or later, then from an AIX shell enter: **lscfg | pg**.

A screen will appear containing one of the following:

- ```
  Model Architecture: rs6k
  Model Implementation:  Uni Processor, MCA Bus
  ```
- ```
  Model Architecture: rs6ksmp
  Model Implementation:  Multiple Processor, MCA Bus
  ```

If you are running AIX 4.2.1 or later Diagnostics:

- Select the Display Configuration and Resource List Task from the Task Selection Menu.

On any AIX system logged on as 'root' user.

- Run the **bootinfo –p** command.

The system platform type is returned.

Block Multiplexer Channel Adapter

The Block Multiplexer Channel Adapter allows the system unit to directly attach to a system–370/390–type block multiplexer channel.

The block multiplexer channel adapter responds to channel commands similar to a 3088 Channel–to–Channel Adapter. However, this adapter does not support full emulation of a 3088.

The block multiplexer channel adapter may also be attached to a host system using the 3044 Model 2 Channel Extender or the 9034 Model 1 ESCON Converter.

Up to two block multiplexer channel adapters may be installed in a system unit.

Since the system is directly attached to the bus and tag cables of the box multiplexer channel of the host system, careful consideration must be made before doing the following:

- Turning off the system unit.

- Loading and running the diagnostic programs.

- Changing position of the bypass switch on the interface cable.

- Connecting or disconnecting any of the cables to the adapter or interface assembly.

Use the following guidelines to understand the actions needed.

Starting or Stopping Communications With the Host System

An operator console for the system is required. The console may be a direct–attached display and keyboard or an ASCII terminal.

Changes to the on–line or off–line status of the block multiplexer channel adapter is made using the System Management Interface Tool (SMIT). If there are two block multiplexer channel adapters installed in this system unit, the status of each adapter must be changed individually.

Stopping Communications

Use the following steps as a guideline for stopping communications with a host block multiplexer channel:

1. Have the operator of the host system stop any communications with this block multiplexer channel adapter.

2. Stop all application programs on this system that use this block multiplexer channel adapter.

3. Use SMIT to change the status of this adapter to *offline*. If needed, see the AIX Version 4.1 *Block Multiplexer Channel Adapter: User's Guide and Service Information* for procedures.

   If you have another block multiplexer channel adapter in this system unit, you must use this same procedure to stop it.

Starting Communications

Use the following steps as a guideline for starting communications with a host block multiplexer channel:

1. Use SMIT to change the status of this adapter to *online*. If needed, see the *AIX Version 4.1 Block Multiplexer Channel Adapter: User's Guide and Service Information* for procedures.

2. Start the application programs that need to use this block multiplexer channel adapter.

3. Have the operator of the host system start communications with this block channel adapter.

   If you have another block multiplexer channel adapter in this system unit, you must use this same procedure to start it.

Running the System Diagnostics

Since the system is directly attached to the bus and tag cables of the block multiplexer channel of the host system, the communications between the host system and all of the block multiplexer channel adapters must be stopped before diagnostics are run on any block multiplexer channel adapter. See "Stop Communications" for this adapter information for general guidelines, or see the *AIX Version 4.1 Block Multiplexer Channel Adapter: User's Guide and Information* for detailed procedures.

Before disconnecting *any* cables from the adapter or interface assembly, the host system block multiplexer channel must be stopped. Get the host system operator to do this for you.

The system diagnostics allow wrap testing at the adapter and at the bus and tag cable connectors. See the *AIX Version 4.1 Block Multiplexer Channel Adapter Information* for detailed procedures.

Error Log Entries

Both the error log in the Version 3 Operating System and the host system error log may provide valuable information for problem solving.

For a description of the system error logging and the error log entries representing this adapter, see the following manuals:

- *AIX Version 4.1 Problem Solving Guide and Reference*, form number SC23–2606
- *Adapters, Devices, and Cable Information*, form number SA23–2764
- *AIX Version 4.1 Block Multiplexer Channel Adapter: User's Guide and Service Information*, form number SC23–2427.

Solving System–to–Host System Communication Problems

Use the *AIX Version 4.1 Block Multiplexer Channel Adapter: User's Guide and Service Information* and the *AIX Version 4.1 Problem Solving Guide and Reference* to solve operational problems after initial installation.

For installation problems, use the *AIX Version 4.1 Block Multiplexer Channel Adapter: User's Guide and Service Information* to be sure the software is installed, the channel is cabled correctly, and the host system and operating system are configured correctly.

Cabling the System Unit to the Host System

Refer to *Adapters, Devices, and Cable Information*, form number SA23–2764, for more cabling information

Enterprise System Connection (ESCON) Adapter

The ESCON Adapter allows the system unit to directly attach to a system 390–type ESCON channel.

The ESCON channel adapter responds to channel commands similar to a 3088 Channel–to–Channel Adapter. However, this adapter does not support full emulation of a 3088.

The ESCON channel adapter may also be attached to a host system using the ESCON Director.

Up to two ESCON channel adapters may be installed in a system unit.

Since the system is directly attached to the ESCON channel of the host system, careful consideration must be made before:

- Turning offthe system unit.
- Loading and running the diagnostic programs
- Connecting or disconnecting any of the cables to the adapter.

Use the following guidelines to understand the actions needed.

Starting or Stopping Communications With the Host System

An operator console for the system is required. The console may be a direct–attached display and keyboard or an ASCII terminal.

Changes to the *online* or *offline* status of the ESCON channel adapter is made using the System Management Interface Tool (SMIT). If there are two ESCON channel adapters installed in this system unit, the status of each adapter must be changed individually.

Stopping Communications

Use the following steps as a guideline for stopping communications with a host ESCON channel:

1. Have the operator of the host system stop any communications with this ESCON channel adapter.

2. Stop all application programs on this system that use this ESCON channel adapter.

3. Use SMIT to change the status of this adapter to *offline*. If needed, see the *AIX Version 3.2 Enterprise Systems Connection Adapter: User's Guide and Service Information* for procedures.

   If you have another ESCON channel adapter in this system unit, you must use this same procedure to stop it.

Starting Communications

Use the following steps as a guideline for starting communications with a host ESCON channel:

1. Use SMIT to change the status of this adapter to *online*. If needed, see the *AIX Version 4.1 Enterprise Systems Connection Adapter: User's Guide and Service Information* for procedures.

2. Start the application programs that need to use this ESCON channel adapter.

3. Have the operator of the host system start communications with this ESCON channel adapter.

   If you have another ESCON channel adapter in this system unit, you must use this same procedure to start it.

Running the System Diagnostics

Since the system is directly attached to the channel of the host system, the communications between the host system and all of the ESCON channel adapters must be stopped before diagnostics are run on any ESCON channel adapter. See "Stopping Communications" for this adapter for general guidelines, or see the *AIX Version 4.1 Enterprise Systems Connection Adapter: User's Guide and Service Information* for detailed procedures.

Before disconnecting *any* cables from the adapter, the host system ESCON channel must be stopped. Get the host system operator to do this for you.

The system diagnostics allow wrap testing at the adapter connector. See the *AIX Version 4.1 Enterprise Systems Connection Adapter: User's Guide and Service Information* for detailed procedures.

Error Log Entries

Both the error log in the Version 3 of the AIX Operating System and the host system error log may provide valuable information for problem solving.

For a description of the system error logging and the error log entries representing this adapter, see the following manuals:

- *AIX Version 4.1 Problem Solving Guide and Reference*, form number SC23–2606
- *Adapters, Devices, and Cable Information*, form number SA23–2764
- *AIX Version 4.1 Enterprise Systems Connection Adapter: User's Guide and Service Information*, form number SC23–2474.

Solving System to Host System Communication Problems

Use the *AIX Version 4.1 Enterprise Systems Connection Adapter: User's Guide and Service Information* and the *AIX Version 4.1 Problem Solving Guide and Reference* to solve operational problems after initial installation.

For installation problems, use the *AIX Version 4.1 Enterprise Systems Connection Adapter: User's Guide and Service Information* to be sure the software is installed, the channel is cabled correctly, and the host system and operating system are configured correctly.

If there is a fiber cable problem, consult *Maintenance Information for Enterprise System Connection Links*, SY27–2597.

Cabling the System Unit to the Host System

Refer to *Adapters, Devices, and Cable Information*, form number SA23–2764 for cabling information.

Enterprise System Connection (ESCON) Channel Emulator

The S/390 Enterprise Systems Connection Channel Emulator adapter provides serial ESCON channel attachment capability between the POWERstation and POWERserver family and high–performance System/390 tape units and tape library units.

The S/390 ESCON Channel Emulator adapter with the AIX ESCON Channel Tape Attachment/6000 (Feature Code 5223) can be used with the following tape products:

- 3490 Magnetic Tape Subsystem, all models
- 3490E Magnetic Tape Subsystem, all models
- 3494 Tape Library Data Server
- 3495 Tape Library Data Server

The ESCON channel emulator adapter may also be attached to a tape control unit using the ESCON Director.

Up to two ESCON channel emulator adapters may be installed in a system unit.

Since the system is directly attached to the ESCON channel of the tape control unit, careful consideration must be made before:

- Turning off the system unit.
- Loading and running the diagnostic programs
- Connecting or disconnecting any of the cables to the adapter.

Use the following guidelines to understand the actions needed.

Starting or Stopping Communications With the Tape Control Unit

AIX Version 4.1 Enterprise Systems Connection Adapter: User's Guide and Service Information

Changes to the *online* or *offline* status of the ESCON channel emulator adapter is made using the System Management Interface Tool (SMIT). If there are two ESCON channel adapters installed in this system unit, the status of each adapter must be changed individually.

Stopping Communications

Use the following steps as a guideline for stopping communications with a Tape Control Unit:

1. Have the operator of the system stop any communications with this ESCON channel emulator adapter.

2. Stop all application programs on this system that use this ESCON channel emulator adapter.

3. Use SMIT to change the status of this adapter to *offline*. If needed, see the *POWERstation and POWERserver S/390 Enterprise Systems Connection Channel Emulator Service Information* for procedures.

   If you have another ESCON channel adapter in this system unit, you must use this same procedure to stop it.

Starting Communications

Use the following steps as a guideline for starting communications with a tape control unit:

1. Use SMIT to change the status of this adapter to *online*. If needed, see the *POWERstation and POWERserver S/390 Enterprise Systems Connection Channel Emulator: User's Guide and Service Information* for procedures.
2. Start the application programs that need to use this ESCON channel emulator adapter.
3. Have the operator of the host system start communications with this ESCON channel emulator adapter.

   If you have another ESCON channel adapter in this system unit, you must use this same procedure to start it.

Running the System Diagnostics

Since the system is directly attached to the channel of the tape control unit, the communications between the host system and all of the ESCON channel emulator adapters must be stopped before diagnostics are run on any ESCON channel emulators. See "Taking the Control Unit Offline with SMIT" for this adapter for general guidelines, or see the *POWERstation and POWERserver S/390 Enterprise Systems Connection Channel Emulator: User's Guide and Service Information* for detailed procedures.

Before disconnecting *any* cables from the adapter, the tape control unit must be stopped. Get the system operator to do this for you.

The system diagnostics allow wrap testing at the adapter connector. See the *POWERstation and POWERserver S/390 Enterprise Systems Connection Channel Emulator: User's Guide and Service Information* for detailed procedures.

Error Log Entries

The error log in the Version 3 of the AIX Operating System may provide valuable information for problem solving.

For a description of the system error logging and the error log entries representing this adapter, see the following manuals:

- *AIX Version 4.1 Problem Solving Guide and Reference*, form number SC23–2606
- *Adapters, Devices, and Cable Information*, form number SA23–2764
- *POWERstation and POWERserver S/390 Enterprise Systems Connection Channel Emulator: User's Guide and Service Information*:ehp1. form number SA23–2722.

Solving System to Tape Control Unit Communication Problems

Use the and the *POWERstation and POWERserver S/390 Enterprise Systems Connection Channel Emulator: User's Guide and Service Information* and the *AIX Version 4.1 Problem Solving Guide and Reference* to solve operational problems after initial installation.

For installation problems, use the *AIX Enterprise Systems Connection Channel Tape Attachment/6000: Installation and User's Guide* to be sure the software is installed, the channel is cabled correctly, and the system and tape control unit system are configured correctly.

If there is a fiber cable problem, consult *Maintenance Information for Enterprise System Connection Links*, SY27–2597.

Cabling the System Unit to the Host System

Refer to *Adapters, Devices, and Cable Information*, form number SA23–2764, for more cabling information.

Fiber Distributed Data Interface (FDDI) Adapter

The Fiber Distributed Data Interface (FDDI) Adapter attaches the system unit to a FDDI network. There are two types of FDDI adapters:

- The fiber distribution data interface (FDDI) single ring adapter (Type 2–6)

- The fiber distribution data interface (FDDI) dual ring upgrade kit adapter (Type 2–7).

The communications link with the FDDI ring is established during workstation initialization; thus no special operator action is required to start using the ring.

For more information about this FDDI adapter and software, see the *Fiber Distributed Data Interface User's Guide*, form number SC23–2426. This manual is shipped with the FDDI adapter.

FDDI Single Ring Adapter Service Considerations

The single ring adapter provides a communication link to the concentrator. The concentrator links the workstations together to form a ring. The number of workstations that attach to a single concentrator is determined by the capacity of the concentrator. The concentrator may also have other concentrators attached to it to increase the number of workstations in the ring. Each workstation can communicate directly with any other workstation in the ring.

If any workstation in the ring has a failure that prevents the signal from being passed back to the concentrator, the concentrator automatically bypasses that workstation to allow communications to continue on the ring.

When you turn the system unit off or disconnect it from the concentrator, the concentrator will bypass that connection to keep communications connection good.

FDDI Dual Ring Adapter Service Considerations

The dual ring adapter provides a dual path for communication between the workstations on the ring. The purpose of the dual path is to provide increased communication availability. The dual ring may also have more than one concentrator in the ring to provide connections to other FDDI rings.

If any workstation in the ring has a failure that prevents the signal from being passed on to the next workstation or concentrator, the FDDI adapter concentrator does a *loop* back on the secondary ring to allow communications to continue on the ring.

In the event two workstations or concentrators fail at the same time the ring could become *segmented*. That would mean part of the ring would act like a ring within itself, but could not communicate with the other parts of the ring. Returning either failing workstation or concentrator to correct working order will restore communications on the complete ring.

When you turn the system unit off, or disconnect one of the FDDI cables, the workstations or concentrators on each side of the system unit will loop the signal back on the secondary ring. This will allow continued communications between each workstation on the ring, except for the one that is turned off.

FDDI Cabling

Refer to *Adapters, Devices, and Cable Information* for additional cabling information.

High–Availability SCSI

A High–availability SCSI configuration consists of two system units or CPU drawers connected to a common set of SCSI devices. The configuration provides high–availability because either system unit or CPU drawer can continue to access the common devices while the other system is unavailable.

The actions needed to isolate a particular system unit or device from the configuration depends on the software controlling the systems and devices. Therefore, be sure you use the documentation with the software to prepare the configuration before turning a system unit or device off.

High–Availability Cabling

Refer to *Adapters, Devices, and Cable Information* for additional cabling information

Diagnostic Summary

Memory and Processor Testing

- Memory and Fixed–Point Processors are only tested during BIST and POST.

- A complete memory test is run during POST.

- The BIST and POST will only halt and report problems that prevent the system from booting.

- All other problems are logged into the IPL Control Block and are only analyzed and reported if the Base System Diagnostic is run.

- The Base System Diagnostic also tests the Floating Point Processor.

IPL Control Block Analysis

- IPL Control Block is only analyzed if the Base System Diagnostic is run.

- IPL Control Block Analysis is an analysis of the IPL Control Block. It has nothing to do with the AIX Error Log Analysis.

- IPL Control Block reports problems that are logged by ROS (firmware) during boot.

Checkstops

- RS1, RS.9, RS2, and SMP systems will reboot whenever a Checkstop occurs.

  Checkstop information is logged into NV–RAM.

  If the system is booted from disk, it will be copied to the AIX Error Log Files where it can be analyzed by diagnostics. However, if the system is booted from CD–ROM, diskette, or tape, it is lost if another check occurs.

- RSC and 60x non–SMP systems will display a 185, 186, or 187 and hang whenever a Checkstop occurs. No Checkstop information is logged.

System Crashes

- System Crashes are indicated by a flashing 888 102 message.

  Status information is logged into NV–RAM. If the system is booted from disk or LAN, it will be copied to the AIX Error Log Files where it can be analyzed by diagnostics for

hardware related causes. However, if the system is booted from CD–ROM, diskette, or tape, it will be lost if another check occurs. At 4.2 support to analyze the status information in NV–RAM is included on the Standalone Diagnostics (boot from removable media).

Error Log Analysis

- Error Log Analysis is analysis of the AIX Error Log.

- Error Log Analysis is part of the diagnostic applications and is invoked by selecting a device from the DIAGNOSTIC SELECTION menu, by using the **diag** command, or selecting the Run Error Log Analysis task.

- Error Log Analysis is only performed when running online diagnostics.

- Error Log Analysis is NOT performed when running from removable media except for mounted CD–ROM.

- Error Log Analysis will only report problems if the errors have reached defined thresholds. Thresholds can be from 1 to 100 depending upon the error.

- Permanent errors do not necessarily mean a part should be replaced.

- Automatic Error Log Analysis (diagela) provides the capability to do error log analysis whenever a permanent hardware error is logged.

- The Product Topology Service Aid will log an entry into the error log each time it detects a new part. This shows ELA that previous errors should not be analyzed. If Product Topology is not run, then the error log should be cleared manually.

Diagnostic Modes

The Diagnostic Modes consist of Problem Determination Mode and System Verification Mode. The only difference between the two modes is one performs ELA and the other does not.

- Problem Determination Mode will run all tests unless the resource is being used. If a problem is not found, then Error Log Analysis is performed.

- In Problem Determination Mode, Error Log Analysis is performed even if a resource is being used.

- A screen will always appear informing the user that the resource needs to be freed if a resource is being used.

- System Verification Mode does not do ELA. This mode should be run when doing a repair verification.

- IPL Control Block Analysis is done in either mode.

It is generally better to run Online Diagnostics versions 2.0 and later from disk than it is to run Standalone Diagnostics.

Diagnostic Changes

Tasks are operations that can be performed on a resource. Running Diagnostics, Displaying VPD, or Formatting a Device, are examples of tasks. Service Aid functionalism should also be considered a task.

Resources are devices used by the system unit. Diskette Drive, and CD ROM Drive are examples of resources.

The FUNCTION SELECTION menu was enhanced with two new selections allowing either all resources, or all tasks to be displayed. When Task Selection is made and a task has been selected a list of supporting resources will be displayed. Alternatively, when Resource Selection is made, and a resource or group of resources are selected, a list of supporting common tasks are displayed. Also, to aid with backward compatibility the FUNCTION SELECTION menu contains 'Diagnostic' and Advanced Diagnostic'.

The 'Display or Change Diagnostic Run Time Options' task can be used to set advanced mode diagnostics, looping capability, and ELA mode when running diagnostics from the Task Selection menu.

The following section describes the 4.2 Diagnostic Subsystem.

diag Command Line Options:

```
COMMAND LINE OPTIONS:


   diag Command line flags are as follows:

  -a          Perform missing device analysis.
  -c          Machine is unattended.  No prompts should be displayed.
  -d resource  Test the named resource.
               The "resource" parameter is the /dev entry.
  -e          Error Log Analysis.
               Checks the error log for device specified in
               "resource" of the -d option.
  -s          Test the system.
  -A          Advanced Diagnostics
  -B          Base system test
  -v          System Verification mode.
  -S          Test the Test Suite Group
                          1 - Base system
                          2 - I/O Devices
                          3 - Async Devices
                          4 - Graphics Devices
                          5 - SCSI Devices
                          6 - Storage Devices
                          7 - Commo Devices
                          8 - Multimedia Devices


  Entering diag -h from the command line will print out an
  appropriate usage statement.

  Default execution mode will be non-advanced mode.
```

Chapter 4. Introduction to Tasks and Service Aids

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

To perform a Task, use the following from the Function Selection Menu:

- Task Selection (Diagnostics, Advanced Diagnostics, Service Aids, etc).

  This selection lists the tasks supported by these procedures. Once a task is selected, a resource menu may be presented showing all resources supported by the task.

Note: Many of these programs work on all system model architectures. Some programs are only accessible from Online Diagnostics in Service or Concurrent mode, others may be accessible only from Standalone Diagnostics. While still other programs may only be supported on a particular system architecture, such as RS6KSMP (Risc System 6000 Symmetric Multiprocessor Platform) Platform), or RS6K (Risc System 6000 Platform).

Tasks

Service Aids are invoked via a task selection from the following list:

- Add or Delete Drawer Configuration
- Add Resource to Resource List
- AIX Shell Prompt
- Backup and Restore Media
- Certify Media
- Change Hardware Vital Product Data
- Configure Dials and LPFKeys
- Create Customized Diagnostic Diskette
- Delete Resource from Resource List
- Disk Maintenance
- Disk Media
- Display Configuration and Resource List
- Display Hardware Error Report
- Display Hardware Vital Product Data
- Display or Change Bootlist
- Display or Change BUMP Configuration
- Display or Change Diagnostic Run Time Options
- Display or Change Electronic Mode Switch
- Display or Change Multi–processor Configuration
- Display Previous Diagnostic Results
- Display Resource Attributes
- Display Service Hints
- Display Software Product Data
- Display Test Patterns
- ESCON Bit Error Rate Service Aid
- Format Media
- Generic Microcode Download
- Local Area Network Analyzer
- Microcode Download
- Periodic Diagnostics

- Process Supplemental Media
- Product Topology
- Run Diagnostics
- Run Error Log Analysis
- SCSI Bus Analyzer
- SCSI Device Identification and Removal
- SCSI Tape Drive Service Aids
- Service Aids for Use with Ethernet
- Spare Sectors Availability
- SSA Service Aids
- Update Disk Based Diagnostics
- 7135 RAIDiant Array Service Aids
- 7318 Serial Communications Network Server

AIX Shell Prompt Service Aid

Note: Use in Online Service mode only.

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

Backup/Restore Media Service Aid

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.

Create Customized Diagnostic Configuration Diskette

This selection invokes the Diagnostic Package Utility Service Aid which allows the user to create a Standalone Diagnostic Package Configuration Diskette.

The Standalone 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 standalone 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).

Diagnostic Package Utility Service Aid

This service aid on 4.1 replaces the Diagnostic Diskette Creation Service Aid on 3.2. The Diagnostic Package Utility Service Aid allows the user to perform the following actions:

- Format a 1, 2, or 4MB diskette

  This function was moved to the Format Media Task at version 4.2.

- Create a Standalone Diagnostic Package Configuration Diskette

  The Standalone 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 standalone 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).

Configure Dials and LPFKeys

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

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

This selection invokes the SMIT utility to allow Dials and LPFKs configuration. A tty must be in the available state on the async port before the Dials and LPFKs 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 LPFKs can be defined on the port.

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.

Certify Media

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

* Hardfile Certify

  Certify reads all of the ID and data fields. It checks for bad data and counts all errors encountered. If more than 10 hard data errors or more than 1 hard equipment error is found, the user is prompted to replace the drive. One or less recovered data errors per megabyte is normal. More than one recoverable data error per megabyte indicates that the disk should be formatted and certified. Disk errors are not logged during certify.

* Diskette Certify

  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.

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

```
diag –c –d <deviceName> –T ”certify”
```

Format Media

This task allows the selection of diskettes or hardfiles to be formatted.

* Hardfile Format

  Writes all 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 as format. After 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.

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 Service Aid 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).

- Diskette Format

  This selection writes patterns to a diskette. Diskette format support was added in Version 4.2

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

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

Flags

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.

Spare Sector Availability

This task consists of Initialize, Format and Certify, and Spare Sector Availability functions for optical disks.

- Initialize

  This service aid is used to format the optical disk without certifying it. This option does not reassign the defective sectors; however, it is a quick way of formatting after cleaning the disk.

- Format and Certify

  This service aid is used to format the optical disk and certify it. The certification process is drive specific and performs the surface analysis of all user data and spare sectors. The defective sectors are reassigned.

- Spare Sectors Availability

  This service aid 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 indicates that the disk needs to be backed up and replaced. Formatting the disk will 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:

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

Disk Maintenance

This service aid consist of the following:

- Disk to Disk Copy Service Aid
- Display/Alter Sector Service Aid

Disk to Disk Copy Service Aid

Note: To access this service aid refer to the Disk Maintenance Service Aid.

The selection allows you to recover data from an old drive when replacing it with a new drive. The service aid only supports copying from a drive to another drive of similar size. This service aid cannot be used to update to a different size drive. The **migratepv** command should be used when updating drives. The service aid will recover all LVM software reassigned blocks. To prevent corrupted data from being copied to the new drive, the service aid will abort if an unrecoverable read error is detected. To help prevent possible problems with the new drive, the service aid will abort 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 used and the drive be installed in an empty location. If there are no empty locations, then one of the other drives will have to 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 you 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 will not display information that cannot be read correctly.

Display or Change Bootlist

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

The system will attempt 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 will proceed in turn to the other devices in the list to attempt an IPL.

Display or Change BUMP Configuration

This service aid is unique to the SMP system units and provides the following functions:

- Display or Change Remote Support Phone Number

    This function allows the remote support phone number to be displayed and altered.

- Display or Change Diagnostics Modes

    This function displays a dialog screen that lists the states of all the BUMP (Bringup Micro–Processor) Diagnostic Flags. The states can be changed via the dialog screen.

- Save or Restore Diagnostics Modes and Remote Support Phone Number

    This function allows the diagnostics modes and remote support phone number to be saved and restored. The location of the save area is to be defined.

- Flash EPROM Download

    This function updates the Flash EPROM.

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 will be displayed.)

Display Hardware Vital Product Data

This service aid will display 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.

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.

Add or Delete Drawer Configuration

This task provides the following options:

- List all Drawers
- Add a Drawer
- Remove a Drawer

The supported drawer types are:

- Media SCSI Device Drawer
- DASD SCSI DASD Drawer

Display Software Product Data

This task displays 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

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 diagnostic and deleted from the Diagnostic Test List is listed. If no resources are available to be added, then none are listed.

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.

Display Previous Diagnostic Results

Note: This service aid is not available when you load the diagnostics from a source other than a disk drive or from a network.

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 Page Down and Page Up 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. This information is stored in the **/etc/lpp/diagnostics/data/*.dat** file.

Display Resource Attributes

This task will display the Customized Device Attributes associated with a selected resource. This task is similar to running the **lsattr –E –l resource** command.

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 running the Run Diagnostic task.

The run time options are:

- Display Diagnostic Mode Selection Menus

  This option allows the user to select whether the DIAGNOSTIC MODE SELECTION MENU is displayed or not (the default is yes).

- Include Advanced Diagnostics

  This option allows the user to select if the Advanced Diagnostics should be included or not (the default is no).

- Include Error Log Analysis

  This option allows the user to select if the Error Log Analysis (ELA) should be included or not (the default is no).

  Note: When running Standalone Diagnostics with Include Error Log Analysis set to Yes, ELA will only be done on the error that is logged in NVRAM.

- Run Tests Multiple Times

  This option allows the user to select if the diagnostic should be run in loop mode or not (the default is no).

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

Display Test Patterns

This service aid provides a means of making adjustments to system display units by providing displayable 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.

Generic Microcode Download

This service aid provides a means of restoring a diskette (or other media) and executing a restored program. This program will do whatever is required to download the microcode onto the adapter or device.

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

When entered, this service aid will display information about what it does, it will then ask for a microcode diskette to be inserted into the diskette drive. The diskette will be in backup format. The service aid will restore the diskette to the **/tmp** directory and execute a program called **genucode.** Once genucode has completed, it will return you to the service aid.

Display Hardware Error Report

This service aid provides a tool for viewing the hardware error log and performing error log analysis. It uses the **errpt** command to do this.

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 or Change Electronic Mode Switch

This service aid is unique to the SMP system units and displays the states of the Physical and Electronic Keys. It also allows the electronic keys to be set.

ESCON Bit Error Rate Service Aid

This service aid is used to check the bit error rate for an ESCON adapter to assure that the link to the host system is functioning properly. To run the ESCON Bit Error Rate Service Aid, the adapter must be connected, configured, and on–line. If the adapter is not configured properly, the service aid will not be able to check the bit error rate.

Local Area Network Analyzer

This service aid and task are used to exercise the LAN communications adapters (Token–Ring, Ethernet, and Fiber Distributed Data Interface (FDDI)). 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.

Download Microcode

This selection provides a way to copy device microcode to a device. It is used to update the microcode on a device. It presents a list of devices that use microcode. The device on which the microcode is to be installed is selected. The service aid will instruct the user on its use.

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

```
diag -c -d <deviceName> -T "download [-s diskette] [-l previous]
[-t* boot] [-F]"
```

Flags

–s   microcode source. **/etc/microcode** is default.

–l   microcode level. latest is default.

–t   microcode type. functional is default.

*   applies to ascsi devices only.

–F   Force flag. Required to download microcode if the current level is unavailable on the source.

Multi–processor Service Aid (Display or Change Multi–processor Configuration Task)

This service aids is unique to the SMP system units and provides the following functions:

- Display or Change Processor States

  This function displays or changes the state of available processors.

- Bind Process

  This function provides a tool for binding a process and all its threads to a specified processor.

Periodic Diagnostics

This service aid 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 can not be tested because it is busy, error log analysis will be performed. Hardware errors logged against a resource can also be monitored by enabling Automatic Error Log Analysis. This will allow error log analysis to be performed every time a hardware error is put into the error log. If a problem is detected, a message will be 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

Process Supplemental Media

Notes:

1. This task is supported in Standalone Diagnostics only.

2. Process and test one resource at a time.

3. Do not process multiple supplements at a time.

Diagnostic Supplemental Media contain all the diagnostic programs and files required to test a resource. Supplemental media is normally released and shipped with the resource.

When prompted, insert the supplemental media. Then press Enter. After processing has completed, go to the resource selection list to find the resource to test.

Product Topology Service Aid

This service aid provides enhanced product and order quality. Additional information is provided in :hdref refid=gen. under :hdref refid=prodtop.

Run Diagnostics

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

The procedures for running the diagnostics will depend on the states of the Diagnostics Run Time Options. The run time options are:

- Display Diagnostic Mode Selection Menus
  If this option is on, the Diagnostic Mode Selection Menu will be displayed when the commit key is pressed.

- Include Advanced Diagnostics
  If this option is on, Advanced Diagnostics will be included.

- Include Error Log Analysis
  If this option is on, Error Log Analysis will be included. When running Standalone Diagnostics with Include Error Log Analysis set to Yes, ELA will only be done on the error that is logged in NVRAM.

- Run Tests Multiple Times

  If this option is on, diagnostic will be run in loop mode. This option is only valid when running Online Diagnostics in Service Mode.

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 will be run on all selected resources.

SCSI Bus Analyzer

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

Prior to version 4.2 the SCSI Bus Service Aid was accessed via the SCSI Bus selection from the Service Aid Selection Menu. Beginning with version 4.2 the SCSI Bus Service Aid is accessed via the SCSI Bus Analyzer option from the Task Selection Menu.

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 will work 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 will display a timeout message. If an error occurs or a response is received, the service aid will then display 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 will display 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 menus allows the user to transmit the SCSI Inquiry Command by pressing the Enter key. The Service Aid will then indicate the status of the transmission. When the transmission is completed, the results of the transmission will be displayed.

Notes:

1. A Check Condition can be returned when there is nothing wrong with the bus or device.

2. AIX will 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 7027 system unit.

The service aid also does the following:

- Generate a menu which displays all SCSI devices.
- Lists the device and all of it's sibling devices.
- List all SCSI adapters and their ports.
- List all SCSI devices on a port.

SCSI Tape Drive Service Aid

This service aid provides a means to obtain the status or maintenance information from a SCSI 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 will be displayed onto the screen. In addition, a message indicating whether the drive is recommended to be cleaned will also be displayed.

- Copy a tape drive's trace table.

  The trace table of the tape drive will be written to diskettes.

  The required diskettes must be formatted for DOS. Writing the trace table may require several diskettes. The actual number of required diskettes will be determined by the service aid based on the size of the trace table. The names of the data files will be of the following format:

  'TRACE<X>.DAT' where 'X' will be the a sequential diskette number. The complete trace table will consist of the sequential concatenation of all the diskette data files.

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

  The service aid will provides options to display the log sense information to 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 will prompt for a file name when the log sense data is 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:

/usr/lpp/diagnostic/bin/utape [–h | –?][–c[–e] | –t | –l] –d <deviceName>

Flags

–c	Display time since drive was last cleaned.
–e	Turn off the interactive mode.
–t	Copy trace table.
–l	Display or copy log sense information.
–h, –?	Display help.

Service Aids for use with Ethernet

This selection provides a tool for diagnosing Ethernet problems. This service aid is used to exercise the Ethernet adapter and parts of the Ethernet network. The service aid works by transmitting a data block to itself. This service aid will work with a wrap plug or with any valid Ethernet network and can be used as a tool to diagnose Ethernet network problems.

When the Ethernet service aid is executed, one of the following messages is returned:

- No errors occurred.
- An adapter error occurred.
- A transmit time–out occurred.
- A transmit error occurred.
- A receive time–out occurred.
- A receive error occurred.
- A system error occurred.
- Receive and transmit data did not match.
- An error occurred that could not be identified.
- The configuration indicates that there are no Ethernet adapters in this system unit.
- Another application is currently using the adapter.
- The resource could not be configured.

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.

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

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 will be 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.

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

```
diag –c –d <device name> –T"option parameters"
```

Flags

Adapter Microcode Download – `"download [–B][–D][–P]"`

–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 – `"download –l <ChId> [–D][–P]"`

–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 – `"format –l <ChId>"`

–l   Physical disk channel/ID (i.e. 27)

Physical Disk Certify – `"certify –l <ChId>"`

–l   Physical disk channel/ID (i.e. 23)
             Physical Disk Identify – "identify"

7318 Serial Communications Network Server Service Aid

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

Chapter 5. Using the System Verification Procedure

Step 1. Considerations before Running This Procedure

- 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. Before starting this procedure, you should stop all programs and the operating system.

  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. If needed, see Chapter 2 for more information about multiple system attachments.

- This procedure requires a direct-attached display or a tty terminal attached to the S1 port.

- This procedure runs the diagnostic programs in standalone mode from either your normal IPL source or from removable media (if installed). If the diagnostic programs are installed on disk or LAN, these procedures should be run from disk or LAN. (See the operator manual for your type tty terminal to find the key sequences you need to respond to the diagnostic programs.)

  If you need more information about standalone mode, see "Diagnostic Modes of Operation" on page NO TAG.

- If a console is not selected, the diagnostics stop with `c31` in the three-digit display. The instructions for selecting a console are displayed on all of the direct-attached displays and any terminal attached to the S1 port. Follow the displayed instructions to select a console display.

- If the system unit is attached to a 5085 or 5086, the `DIAGNOSTIC OPERATING INSTRUCTIONS` menu does *not* display on the display attached to the 5085 or 5086.

- Go to Step 2.

Step 2. Loading the Diagnostic Programs

1. Stop all application programs running on the operating system.

2. Stop the operating system (If help is needed; call your 800 support number).

3. Power the system off.

4. Set the key mode switch to the Service position.

5. If you want to run the diagnostics with removable media, and are running the diagnostics from a terminal attached to an S1 port, continue with this substep. If not, go to substep 6.

   - The terminal must be attached to the S1 port on the system unit.
   - The attributes for the terminal must be set to match the defaults of the diagnostic programs. (For more information regarding attributes refer to Chapter NO TAG "Using the Diagnostics".)
   - Before changing any settings, record the normal settings, and be sure the terminal attributes are set to work with the diagnostic programs.

6. Power the system on.

   If `c07` is displayed, insert the next diagnostic diskette.

   If `c31` is displayed, select the console display using the displayed instructions.

7. When the `DIAGNOSTIC OPERATING INSTRUCTIONS` display, go to Step 3.

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. This is a separate and different operation than selecting the console display.

3. If you want to do a general checkout without much operator action, select the `Diagnostic Routines` option on the `FUNCTION SELECTION` menu.

   Note: 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 `System Checkout` 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 from the list displayed on your terminal. When you have checked all of the resources you need to check, go to Step 5.

Step 5. Stopping the Diagnostics

1. If you are running the diagnostics from removable media, go to substep 2. If diagnostics are being run from disk or LAN, the system first should be shut down using the following procedure:

   a. Continue to press F3 until you get to the `DIAGNOSTIC OPERATING INSTRUCTIONS`.

   b. Press F3 once and follow the displayed instructions to shut down Version 3 of the operating system.

2. Set the key mode switch to the Normal position.

3. If you changed any attributes on your tty terminal to run the diagnostic programs, change the settings back to normal.

4. This completes the system verification. Report the SRN to the service organization if you received one. To do a normal IPL, turn off the system unit and wait 30 seconds; then set the power switch of the system unit to On.

Chapter 6. Hardware Problem Determination

This chapter contains steps for obtaining a service request number (SRN) to correct hardware problems.

Hardware Problem Determination Procedure

This chapter contains steps for obtaining a service request number (SRN). You report the SRN to the service organization. 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 Performing This Procedure

Note: See the operator manual for your type of ttyterminal to find the key sequences you need to respond to the diagnostic programs.

- The diagnostic programs can use direct-attached displays or a tty terminal attached to the S1 port.

- This procedure asks you to select the mode you want to run the diagnostic programs in (standalone, maintenance, or concurrent). If you need more information about the modes, see "Diagnostic Modes of Operation" in Chapter 3.

- If the system unit is attached to a 5085 or 5086, the `DIAGNOSTIC OPERATING INSTRUCTIONS` do *not* display on the display attached to the 5085 or 5086.

- If the procedure instructs you to stop the operating system, refer to Chapter 7 for additional information.

- Go to Step 2.

Step 2

(From Step 1)

Version 3 of the operating system contains the diagnostic programs. Other operating systems may not contain diagnostic programs.

Is Version 3 of the operating system used on this system?

NO   Go to Step 21.
YES   Go to Step 3.

Step 3

(From Step 2)

Determine if Version 3 of the operating system is accepting commands.

Is Version 3 of the operating system accepting commands?

NO   Try the following:
1. Stop the operating system.
2. If you cannot stop the operating system, set the power switch on the system unit to Off; then go to Step 6.

YES   Go to Step 4.

Step 4

(From Step 3)

Diagnostic tests can be run on many resources while the operating system is running. However, problem isolation is obtained by running diagnostics in standalone mode.

Do you want to run the diagnostics in standalone mode?

NO   Go to Step 5.

YES   Do the following to shut down your system:
1. At the system prompt, stop the operating system.
2. After the operating system is stopped, set the power switch on the system unit to Off.
3. Go to Step 6.

Step 5

(From Step 4)

This step loads concurrent diagnostics.

1. Log on as `root` or as `superuser`.

2. Enter the **diag** command.

3. Wait until the words `DIAGNOSTIC OPERATING INSTRUCTIONS` are displayed, or 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.
2. After the operating system is stopped, set the power switch on the system unit to Off.
3. Go to Step 6.

YES   Go to Step 10.

Step 6

(From Steps 3, 4, 5, 7)

This step loads standalone diagnostics.

1. Set the key mode switch to the Service position.

2. Be sure the power switches of the attached devices are set to On.

3. Set the power switch on the system unit to On.

4. If `c31` is displayed, follow the displayed instructions to select a console display. If you do not have a console display, set the key mode switch to the Normal position and then set it to the Service position to indicate to the diagnostics there is no console display.

    If you cannot select a console display, go to Step 20. Otherwise, continue to the next substep.

5. Wait until one of the following conditions occurs, then go to the next substep:

    - The power-on light does not come on, or it comes on and does not stay on.
    - The same number is displayed in the 3-digit display for longer than three minutes, and the power-on light is on.
    - The number `888` is flashing in the 3-digit display.
    - The 3-digit display is blank.
    - The system stops with two or more numbers between `221` and `296` alternating in the 3-digit display.
    - The words `DIAGNOSTIC OPERATING INSTRUCTIONS` are displayed.

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

Symptom	Action
The system stops with a blank 3-digit display and the words `DIAGNOSTIC OPERATING INSTRUCTIONS` are displayed with no obvious problem on the console display (for example, it is not distorted or blurred).	Go to Step 10.
The power-on light 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. If you do not find a problem, record SRN `111–152` and report the problem to the service organization. **STOP**. You have completed these procedures.
The system stops with a steady (not flashing) number displayed in the 3-digit display, and the power-on light is on.	The number must be other than `c31`. See substep 3 above for this number. Go to Step 7.
The system stops with `888` flashing in the 3-digit display.	Go to Step 8.
The system stops with a blank 3-digit display, and the words `DIAGNOSTIC OPERATING INSTRUCTIONS` are *not* displayed correctly.	Go to Step 9.
The 3-digit display is blank and the normal system log-in screen is displayed.	Be sure the key mode switch is set to the Service position. If the key mode switch was not in the Service position, stop the operating system, set it to the Service position, and press Reset. Then repeat this step. If the key mode switch was in the Service position, record and report SRN `111–102`. **STOP.** You have completed these procedures.
The system stops with two or more numbers between `221` and `296` alternating in the 3-digit display.	Go to Step 16.

Step 7

(From Step 6, 18)

The following steps analyze a steady (not flashing) number displayed in the 3-digit display while attempting to load the diagnostics.

3-Digit Display Number	Action
200	Be sure the key mode switch is set to the Service position. If the key mode switch was not in the Service position, set it to the Service position, and then go to Step 6, substep 4. If the key mode switch was in the Service position, record and report SRN `111–200`. **STOP.** You have completed these procedures.
260, 261, 262	Go to Step 21.
Any other number	Record and report SRN `101–xxx` (where `xxx` is the number displayed in the 3-digit display). **STOP**. You have completed these procedures.

Step 8

(From Steps 6, 18)

A flashing `888` in the 3-digit display indicates that a crash message or a diagnostic message is ready to be read.

1. Use the steps in the "Reading Flashing 888 Numbers" in Chapter 3 to:

   - Read all of the message.
   - Identify the SRN if applicable.
   - Record the remaining numbers for the service representative.

2. If you identified an SRN, go to substep 3. Otherwise, go to substep 5.

3. Record the SRN and any other numbers.

4. Report the SRN to the service organization. Report any other numbers read to the service representative to determine the location of the failing FRU.

5. **STOP**. You have completed these procedures.

Step 9

(From Steps 6, 18, 20)

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 your display documentation for problem determination.
tty terminal	Go to the documentation for problem determination for this type of terminal.

Step 10

(From Steps 5, 6, 12, 18)

The diagnostic control program loaded correctly.

Press the Enter key.

Is the `FUNCTION SELECTION` **menu displayed?**

NO   Go to Step 11.

YES   Go to Step 12.

Step 11

(From Steps 10, 20)

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 and report service request number `111-921`. **STOP**. You have completed these procedures.
102-key keyboard. Identify by the type of Enter key used. The Enter key extends into two horizontal rows of keys.	Record and report service request number `111-922`. **STOP**. You have completed these procedures.
Kanji keyboard. Identify by the Japanese characters.	Record and report service request number `111-923`. **STOP**. You have completed these procedures.
tty-terminal keyboard. This applies to all attached terminals.	Go to the documentation for problem determination for this type terminal.

Step 12

(From Step 10)

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 table on the following page, find the menu or system response you received when you selected `Diagnostic Routines`; then follow the instructions given in the Action column.

System Response	Action
The `DIAGNOSTIC MODE SELECTION` menu is displayed.	Select `Problem Determination`, and then go to Step 13.
The `MISSING RESOURCE` menu is displayed.	Follow the displayed instructions until either the `DIAGNOSTIC SELECTION` menu or an SRN is displayed. If the `DIAGNOSTIC SELECTION` menu is displayed, go to Step 13. If you get an SRN, record it, and go to Step 15. If you get a number in the 3-digit display, go to Step 14.
The `NEW RESOURCE` menu is displayed.	Follow the displayed instructions. Note: Devices attached to serial ports S1 or S2 will not appear on the `NEW RESOURCE` menu. If the `DIAGNOSTIC SELECTION` menu is displayed, go to Step 13. If you get an SRN, record it, and go to Step 15. If you do *not* get an SRN, go to Step 19.
The diagnostics begin testing a resource. **Note:** 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 will 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 `ADVANCED DIAGNOSTIC SELECTION` menu is displayed, go to Step 10. If an SRN is displayed, record it, and go to Step 15.

Step 13

(From Step 12)

The system checkout option checks all of the resources (available in standalone mode only).

Select and run the diagnostic tests on the resources you are having problems with or run system checkout to check all of the configured resources. Find the response in the following table and perform the specific action.

Diagnostic Response	Action
An SRN is displayed.	Go to Step 15.
The system stopped with a number displayed in the 3-digit display.	Go to Step 14.
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 19. Notes: If dials and LPFKs are attached to serial ports S1 or S2 and you are running diagnostics from disk or server, the dials and LPFKs will only appear on the selection screen if they have been configured by the user. Use the Dials and LPFKs Configuration service aid to configure these devices. If the dials and LPFKs are attached to serial ports S1 or S2, you must configure them using the Dials and LPFKs Configuration service aid before they can be tested from diskette.

Step 14

(From Steps 12, 13)

A flashing `888` in the 3-digit display indicates that a crash message or a diagnostic message is ready to be read.

1. Use the steps in the "Reading Flashing 888 Numbers" in Chapter 3 to:

   - Read all of the message.
   - Identify the SRN.
   - Record the remaining numbers for the service representative.

2. Record the SRN.

3. Report the SRN to the service organization. Report any other numbers to the service representative to determine the location of the failing FRU.

4. **STOP**. You have completed these procedures.

Step 15

(From Steps 12, 13)

The diagnostic programs produced an SRN for this problem.

1. Record the SRN and any other numbers.

2. Report the SRN to the service organization.

3. **STOP**. You have completed these procedures.

Step 16

(From Step 6)

The system stopped with two or more numbers between `221` and `296` alternating in the 3-digit display. This indicates the diagnostics could not load from disk, so the load program is looking for the diagnostic programs on the diskettes or some other load device.

Are you trying to load the diagnostic programs from diskettes or a CD-ROM disc?

NO   Go to Step 22.
YES   Record and report SRN `111–101`.

                      STOP. You have completed these procedures.

Step 17

(From Steps 21, 22)

When you load the diagnostics from diskettes or a CD-ROM disc and run them from a tty terminal, the attributes for the terminal must be set to match the defaults of the diagnostic programs. The tty terminal must be attached to port S1 on the system unit.

Are you going to load the diagnostics from diskettes or a CD-ROM disc and run them from a tty terminal attached to port S1?

NO   Go to Step 18.

YES   Go to "Running the Diagnostic Programs from a tty Terminal" in Chapter 3 and be sure your terminal attributes are set to work with the diagnostic programs.

                      Return to Step 18 when you finish checking the attributes. Record any settings that are changed.

Step 18

(From Step 17)

The following steps analyze a failure to load the diagnostic programs from a disk, or a failure to determine whether the diagnostic programs are on a disk.

1. Set the power switch on the system unit to Off.

2. Set the key mode switch to the Service position.

3. Insert either the first diagnostic diskette into the diskette drive or the diagnostic CD-ROM disc into the CD-ROM drive.

4. Set the power switch on the system unit to On.

5. If `c07` is displayed in the 3-digit display, insert the next diagnostic diskette. If `c31` is displayed, follow the displayed instructions to select the console display. If no console display is available, set the key mode switch to the Normal position, and then set it to the Service position to indicate to the diagnostics that there is no console display.

   If you cannot select a console display, to Step 20. Otherwise, continue to the next substep.

6. Wait until one of the following conditions occur, then go to the next substep:

   - The system stops with two or more numbers between `221` and `296` alternating in the 3-digit display.
   - The same number is displayed in the 3-digit display for longer than three minutes, and the power-on light is on.
   - The number `888` is flashing in the 3-digit display.
   - The 3-digit display is blank.
   - The words `DIAGNOSTIC OPERATING INSTRUCTIONS` are displayed.

7. Starting at the top of the following table, find your symptom; then perform the specific action.

Symptom	Action
The system stops with a blank 3-digit display, and the words DIAGNOSTIC OPERATING INSTRUCTIONS are displayed with *no* obvious problem on the console display (for example, it is *not* distorted or blurred).	Go to Step 10.
The system stops with a blank 3-digit display, and the words DIAGNOSTIC OPERATING INSTRUCTIONS are *not* displayed correctly.	Go to Step 9.
The system stops with 260, 261, or 262 displayed in the 3-digit display.	Record and report SRN 111–101. **STOP.** You have completed these procedures.
The system stops with a steady (not flashing) number displayed in the 3-digit display, and the power-on light is on.	The number must be other than c07 or c31. See previous substep 4 for these numbers. Go to Step 7.
The system stops with 888 flashing in the 3-digit display.	Go to Step 8.
The system stops with two or more numbers between 221 and 296 alternating in the 3-digit display.	Record and report SRN 111–101. **STOP**. You have completed these procedures.

Step 19

(From Steps 12, 13)

The diagnostics did not find a hardware problem. If you still have a problem, contact your software support center. If you are attached to another system, refer to Chapter 2 and check your configuration before calling the software support center.

Step 20

(From Steps 6, 18)

When the c31 halt was present, were the instructions to select a console display readable with no obvious problems with the display?

NO   Go to Step 9.

YES   Go to Step 11.

Step 21

(From Steps 2 and 7)

An English-only version of diagnostics are provided on diskette and CD-ROM disc.

Do you want to run diagnostics from diskette or a CD-ROM disc?

NO   If you have a problem, call for service, and report the problem.

YES   Go to Step 17.

Step 22

(From Step 16)

An English-only version of diagnostics are provided on diskette and CD-ROM disc.

Do you want to run diagnostics from diskette or a CD-ROM disc?

NO   Record and report SRN `111–103`. **Stop**. You have completed these procedures.

YES   Go to Step 17.

Chapter 7. Changing the System Unit Position

This chapter explains how to change the 7012 system unit to position it either horizontally or vertically.

Changing the System Unit Base

As shown in Chapter 1, the system unit operates in either a horizontal or vertical position. When the unit is used in the horizontal position, there is a base that is attached to the bottom of the unit with two large screws. When you want to use the system unit in the vertical position, the base can be removed from the bottom and attached to the side of the unit that has two mounting holes. The screws have knobs for ease in attaching or removing the base and are captured in the base with a retaining ring. No screwdriver is required.

Note: Refer to "Stopping the System Unit" on page 2-5 before changing the system unit base.

1. Stand the unit on the side with the two screw mounting holes facing upward.

2. Loosen the two screws that are attached to the base.

3. Remove the base.

Attention: In the following illustration, the system unit is shown tilted on the side that does not have screw mounting holes. Do *not* operate the system unit on the side that does not have base screw mounting holes. This may result in damaged or lost data.

The front of your system will look like one of the following illustrations.

Screw Mounting Holes

Base

Screws   **Base**
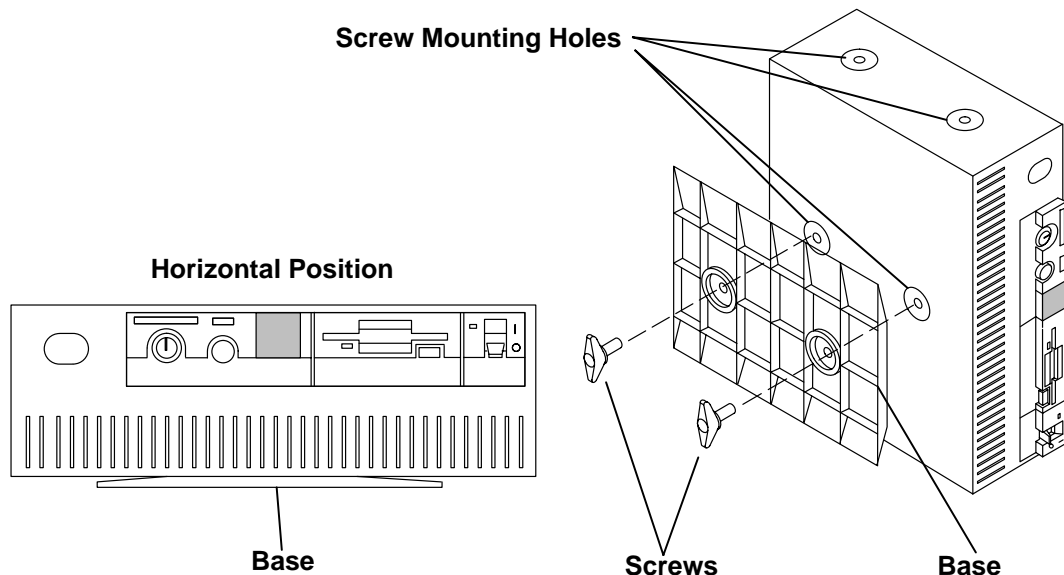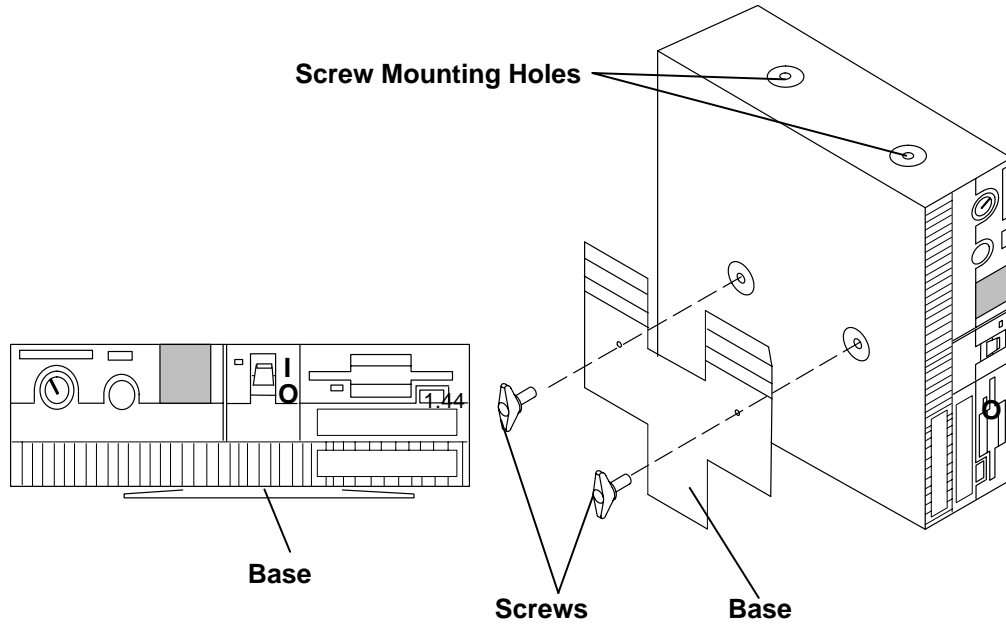
4. Place the base on the side of the unit that has the two screw mounting holes.
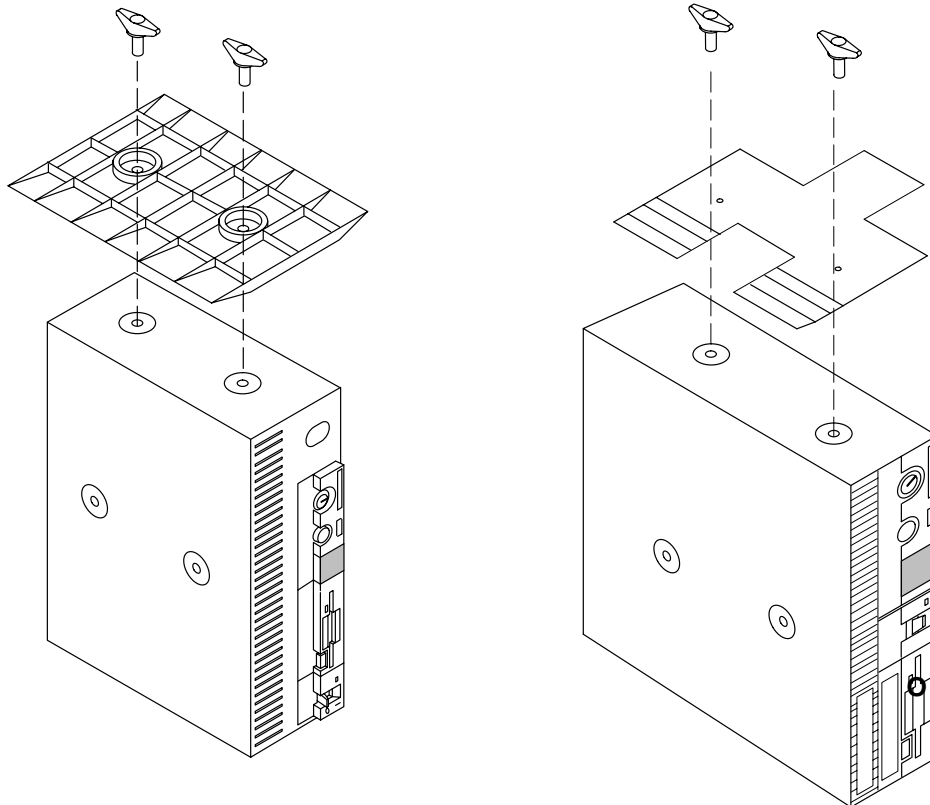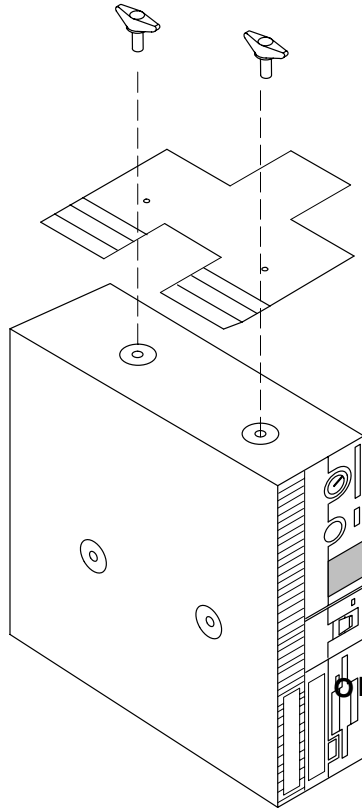
5. Tighten the two screws to the unit until the screws are finger-tight.

6. Stand the unit in the vertical position on the base.

Vertical Position

Base

Base
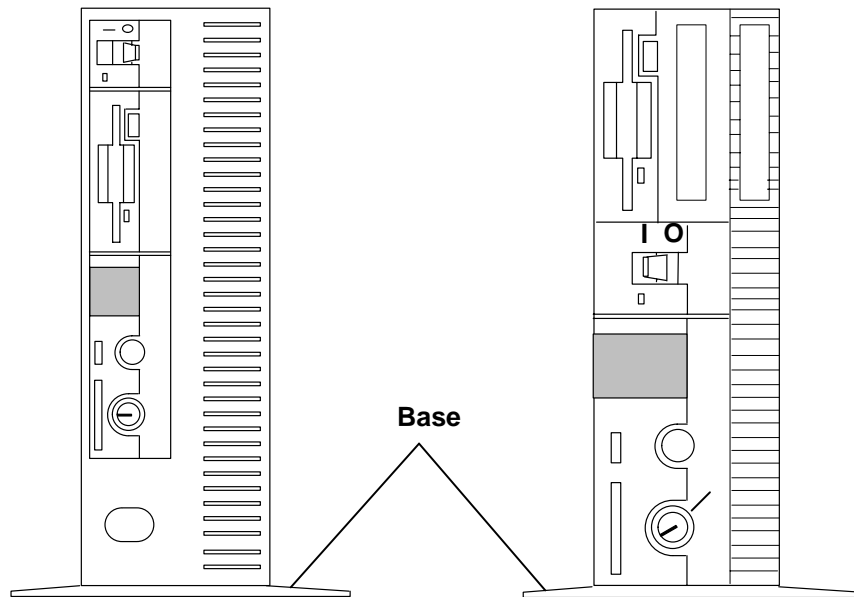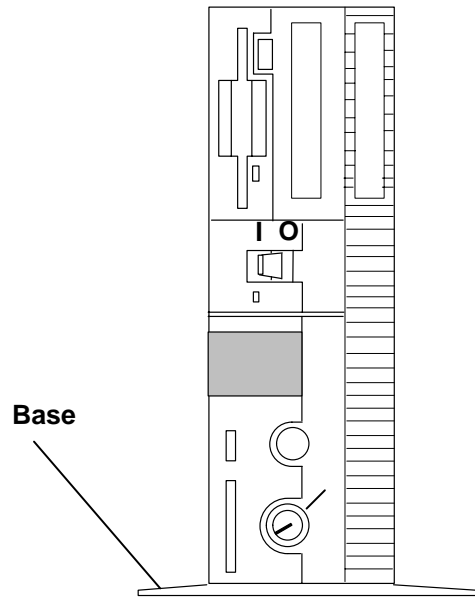
To change the unit from a vertical to a horizontal position, reverse the procedure.

Changing the Logo Position

There are two logos on most system units: one on the front cover and one on the back cover. The logos can be turned so they can be read when the system unit is in either a horizontal or a vertical position.

With the system unit in the vertical position, to change the logos:

1. Grasp the logo with your fingertips.

2. Turn the logo 90° in a clockwise direction on the front cover (counterclockwise direction on the back cover, if present).

3. Release the logo back into position.

Vertical Position
Front View

Vertical Position
Back View
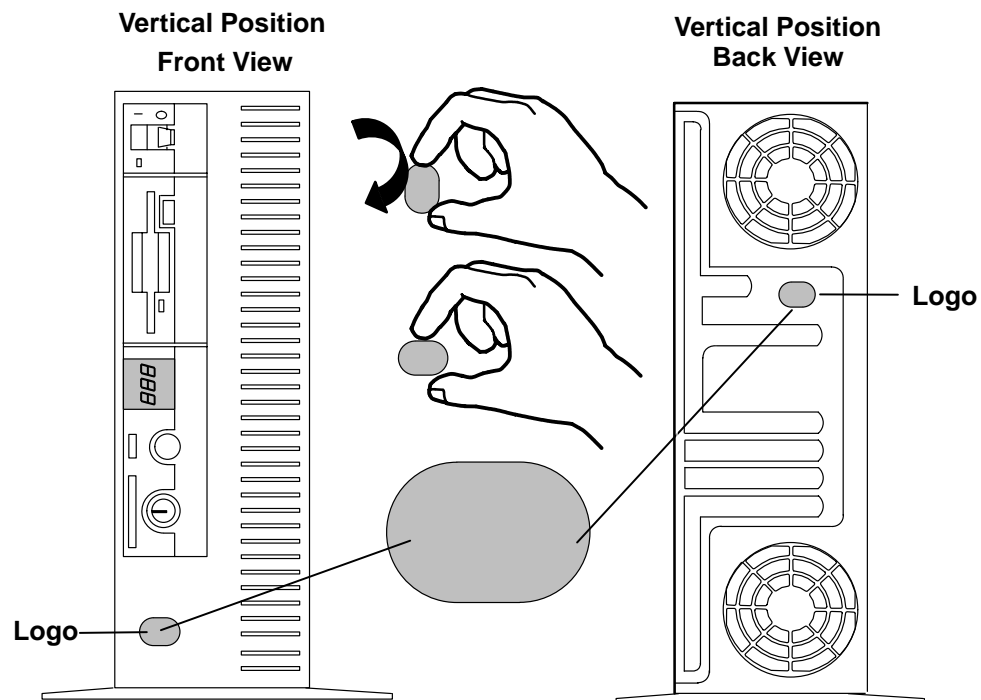
To change the logos when the unit is in a horizontal position, use the same procedure. But, in step 2, turn the logo 90° in a counterclockwise direction on the front cover (clockwise direction on the back cover, if present).

Vertical Position
Front View

Vertical Position
Back View

S 1

S2

Logo

I O

P
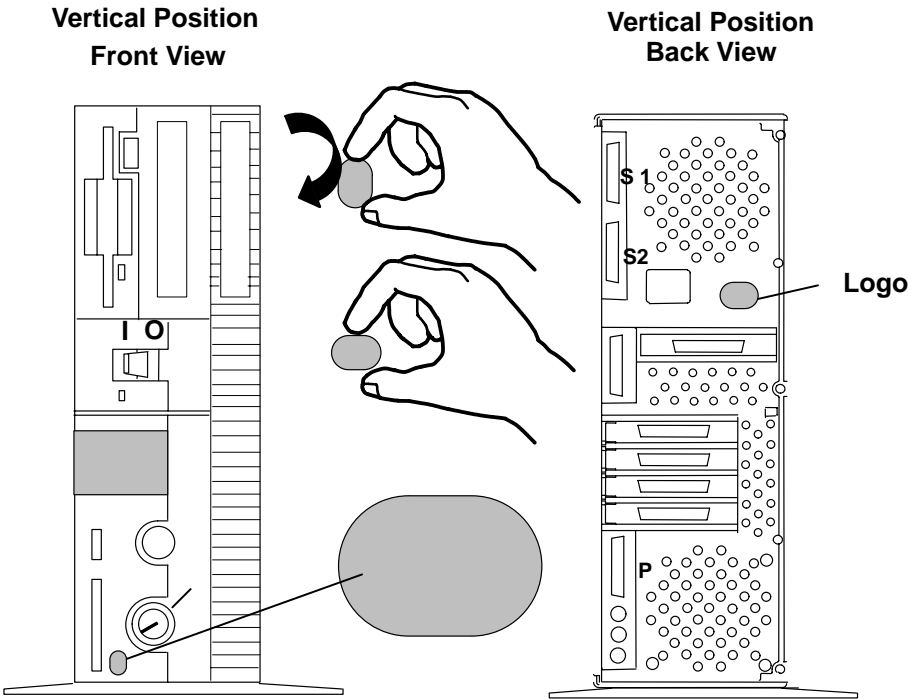
Changing the Three-Digit Display Position

You can change the three-digit display position so that it can easily be read when the system unit is in the vertical or horizontal position.

There is a hinged lens over the three-digit display.

Note: In the following figures, the three 7-segment characters appear lit to help in understanding the position of the three-digit display.

Three-Digit Display **(Vertical Position with Hinged Lens Closed)**

Three-Digit Display **(Vertical Position with Hinged Lens Closed)**
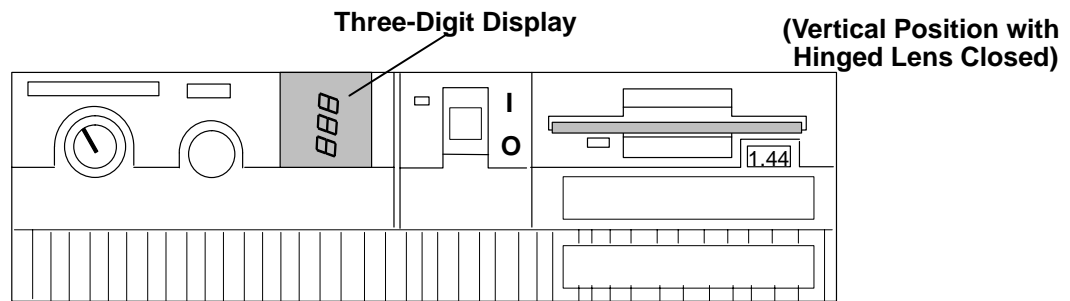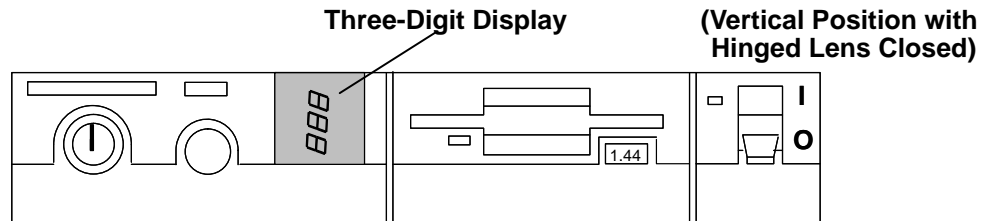
To change the display with the system unit in the horizontal position and the three-digit display in the vertical position, do the following:

1. To open, push down on the top of the hinged lens.

Character Holder **Three-Digit Display** **(Vertical Position)**

Hinged Lens (Open)

Character Holder **Three-Digit Display** **(Vertical Position)**
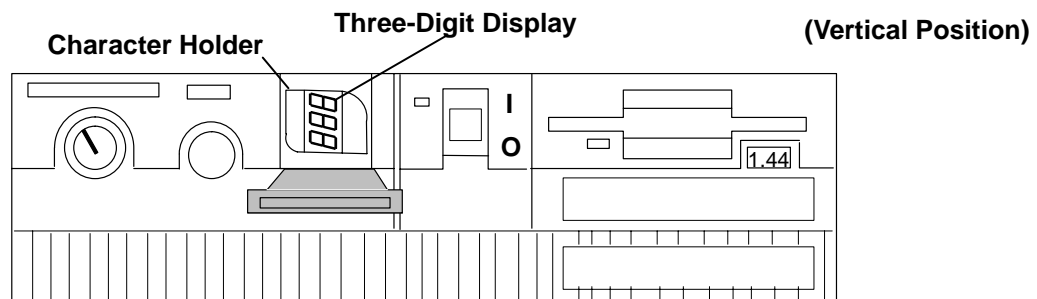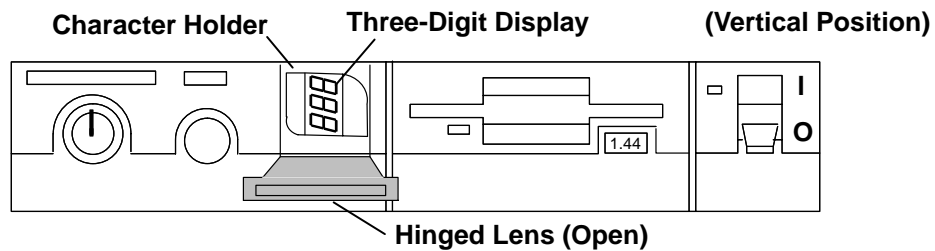
2. Grasp the character holder with your fingertips.

3. Turn the holder 90° in a counterclockwise direction.

Three-Digit Display   **(Horizontal Position)**

Hinged Lens (Open)

Character Holder   **Three-Digit Display**   **(Horizontal Position)**

Hinged Lens (Open)

4. Close the hinged lens.

Three-Digit Display   **(Horizontal Position with Hinged Lens Closed)**

Three-Digit Display   **(Horizontal Position with Hinged Lens Closed)**
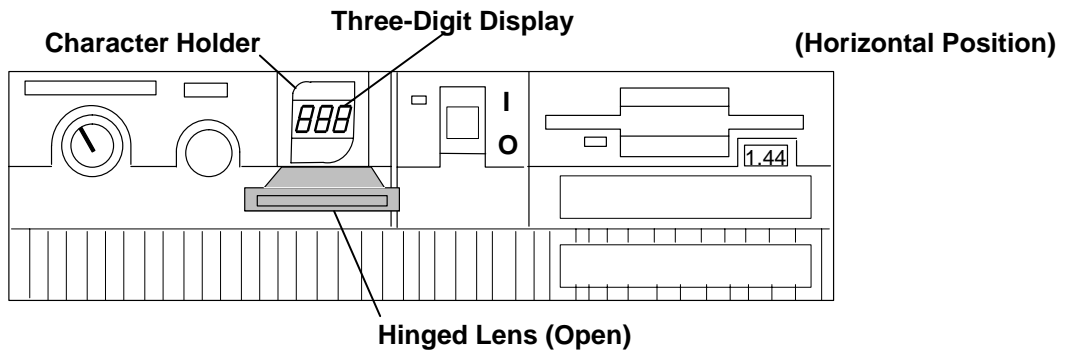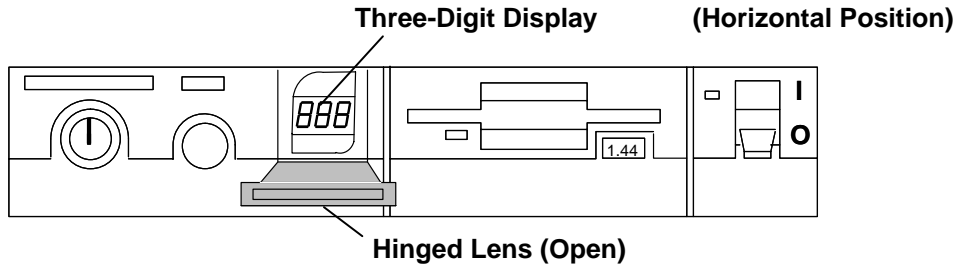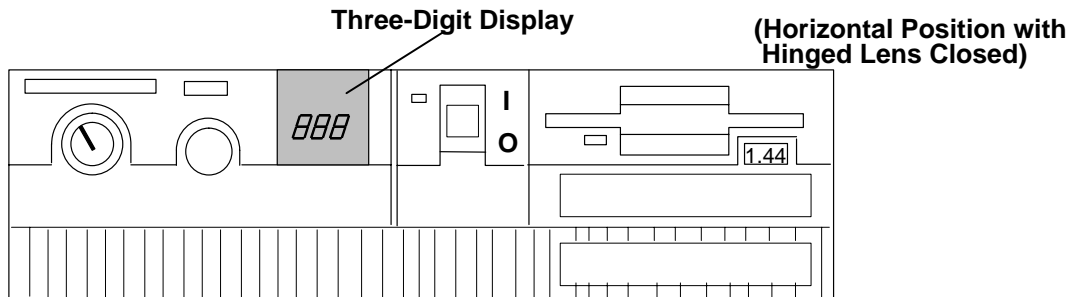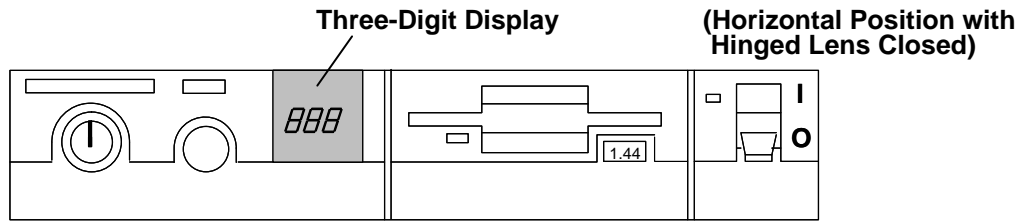
To change the three-digit display when the system unit is in the vertical position and the three-digit display is in the horizontal position, use the same procedure, except for step 3. Turn the holder 90° in a clockwise direction.

Chapter 8. Moving the System Unit

This chapter provides important information about moving the system unit.

Moving the System Unit

Attention: Damage as a result of improper handling may void your equipment warranty. Contact your local representative to obtain packing materials or assistance to prepare your system for moving.

A trained service representative should be contacted to move your system. The following danger and caution notices should be observeddanger and caution notices should be observed if you decide to move the unit yourself.

Note: For a translation of these notices, see System Unit Safety Information.

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 three-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.

DANGER

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

1. Set the power switches on the attached devices and the system unit to Off.

2. Unplug all attached devices and the system unit from power outlets.

3. Be sure to label all of the cables and cords connected to the rear of the system unit as you disconnect them.

4. In the location you are moving to, the power outlets should be checked for correct wiring, voltage, and grounding before attaching any of the devices or the system unit. See "Checking Customer Outlets" in *7012 300 Series Installation and Service Guide*.

5. Connect all signal cables to the devices before connecting any device or the system unit to the power outlets.

Chapter 9. Diskless/Dataless Workstation Configuration

This chapter explains how to set up the system unit for diskless/dataless operation.

Diskless/Dataless Workstation Configuration

There are two ways to configure the 7012 system units:

- Standard system – the operating system is on the disk drive within the 7012.

- Diskless/dataless system – the operating system is on a remote server. When the operating system is on a remote server, the workstation is referred to as a diskless/dataless workstation.

In this manual, the configuration that uses a remote server to load the operating system is referred to as diskless/dataless.

Note: The diskless/dataless system cannot boot without using a network server. The diskless/dataless system is called the *client* of the server.

What type of system do you want to create when you install the software on this system?

Standard system   Go to your software installation guide.

Diskless/dataless system: Go to Step 1, "Planning."

Step 1. Planning

This chapter contains procedures for preparing a client so that it can be added to an existing diskless/dataless network.

Before you can proceed with the procedures in this section, you need to collect the following information from your network administrator:

1.1   What kind of network are you using to contact your diskless BOOT server? (Circle one and then go to the step listed after your choice.)

   – Token-Ring   (Go to substep 1.2)

   – Ethernet   (Go to substep 1.4)

1.2   What is the location of the Token-Ring card in your system that you want to use to contact your BOOT server? (Refer to your *About Your Machine* document for correct card location.) (Circle one.)

   – Micro Channel slot 1   (Go to substep 1.3)

   – Micro Channel slot 2   (Go to substep 1.3)

   – Micro Channel slot 3   (Go to substep 1.3)

   – Micro Channel slot 4   (Go to substep 1.3)

1.3   What data rate is the Token-Ring?

Note: It is very important that you use the correct data rate. An incorrect rate can cause disruption of your network.

   – 4M bit   (Go to substep 1.4)

   – 16M bit   (Go to substep 1.4)

1.4   Do you need to enter any of the following addresses? If yes, write down the addresses.

Note: You must include any leading zeros in each triplet of numbers. For example, if your address is 1.11.111.1, you must enter '`001.011.111.001`'.

   Client address: [_ _ _ . _ _ _ . _ _ _ . _ _ _]

   BOOTP server address: [_ _ _ . _ _ _ . _ _ _ . _ _ _]

   Gateway address: [_ _ _ . _ _ _ . _ _ _ . _ _ _]

1.5   If the network cables are not already connected, ask your system administrator if your network cables can be connected later (in Step 2).

1.6   Go to Step 2, "Starting the System."

Step 2. Starting the System

2.1   Set the system unit power switch to the Off position if it is not already off.

2.2   If your system administrator gave permission (in Step 1), connect your network cables.

2.3   Turn the key mode switch to the Secure position.

2.4   Turn on all attached devices, such as terminals, tape drives, monitors, and external disk drives.

2.5   Set the system unit power switch to the On position.

2.6   Wait for `200` to appear in the three-digit display and then continue with substep 2.7.

2.7   Turn the key mode switch to the Service position.

2.8   Press the yellow Reset button. What happens next depends on how your system is configured. Wait a minute to see which of the following occurs:

   • If the Select Language menu displays, go to substep 2.9.

   • If the Main Menu displays, go to Step 3, "Setting Up Network Configuration."

   • If the screen remains blank and the number `261` or `262` displays in the three-digit display and you are using an ASCII (async) terminal, press one of the number keys on your keyboard and continue with Step 3, "Setting Up Network Configuration."

   • If the screen remains blank and the number `261` or `262` does *not* display, consult your *AIX Version 4 Problem Solving Guide and Reference*

2.9   Enter the number corresponding to the language you want to use in these menus. The screen will change to display the language you selected.

   To return to the Main Menu, enter `99`.

   Go to Step 3, "Setting Up Network Configuration."

Step 3. Setting Up Network Configuration

```
                          Main Menu
                Configuration and Diagnostics

     1.    Select BOOT (Startup) Device
     2.    Select Language for these Menus
     3.    Send Test Transmission (PING)
     4.    Exit Main Menu and Start System (BOOT)












     Type the number for your selection, then press "ENTER"
     (Use the "Backspace" key to correct errors)
```

3.1   From the Main Menu, select the **Select BOOT (Startup) Device** option (1) and press Enter.

The Select BOOT (Startup) Device menu displays.

Consult your answers to the Step 1, "Planning" questions to help you complete the following steps.

3.2   If you are booting over a Token-Ring network, go to substep 3.3.

If you are booting over an Ethernet network, select Ethernet and go to substep 3.4.

3.3   For each Token-Ring adapter, you have two selections: 16M-bit and 4M-bit data rates.

Note: It is very important that you select the correct data rate. An incorrect data rate may cause the total disruption of your network.

3.3.1   Enter the number for the selection that corresponds to the adapter, slot and data rate combination that you want to use to communicate with your diskless BOOTP server.

3.3.2   Go to substep 3.4.

3.4   The Set or Change Network Addresses screen should display. If you do not need to enter any addresses, go to substep 3.5.

If you *do* need to enter addresses, do the following:

Note: You must include any leading zeros in each triplet of numbers. For example, if your address is 1.11.111.1, you must enter '`001.011.111.001`'.

3.4.1   Type the number in front of each address you want to enter and then type in the address. (Do *not* enter `99` when you have finished entering addresses.)

3.4.2   Go to substep 3.5.

3.5   Locate the line on the screen that begins with `Hardware Address`. Write down the hardware address in the space below.

Hardware address _____.

3.6   You are now ready to return to the Main Menu. enter `99`.

3.7   You now need to find out how much memory (RAM) is installed on your system. There are three ways to find out how much memory (RAM) you have:

- Check the "About Your Machine" list.

- Call your system administrator.

- Use the procedures in Chapter 5.

Write down your memory size on the line below.

Total memory _____.

3.8   Are you the administrator for the diskless BOOT server this client will use?

NO   Go to Step 4, "Waiting for Client Registration on the Diskless Server."

YES   Set the system unit power switch to the Off position. Go to substep 3.9.

3.9   Will this machine use AIX Version 3.2 as its operating system?

NO   Go to Step 4, "Waiting for Client Registration on the Diskless Server."

YES   Go to Chapter 10, "Diskless Systems Installation" in the *AIX Installation Guide*.

Step 4. Waiting for Client Registration on the Diskless/Dataless Server

Before you can continue, the administrator of your server must add your machine as a diskless client on the diskless server. Before your client can be registered (added), the server administrator must know two things about your machine:

* The hardware address of your machine (the address you wrote down in substep 3.5).

* The amount of memory (RAM) in your machine (the amount you wrote down in substep 3.7).

Contact your administrator now and report your hardware address and RAM.

You must halt at this point and wait until your administrator has finished adding your client machine to the server.

You have two choices:

* You can leave this machine powered on while you wait. This way you will not have to repeat Step 2, "Starting the System" and Step 3, "Setting Up Network Configuration" when you are ready to continue with the setup of this machine. When your diskless server administrator informs you the client is registered, continue with Step 5, "Booting the Diskless Client."

* If your administrator cannot add your machine to the server right away and you are uncomfortable leaving the client on, you can turn the system power off now. After the client has been registered, repeat Step 2, "Starting the System" and Step 3, "Setting Up Network Configuration," and then continue with Step 5, "Booting the Diskless Client."

Step 5. Booting the Diskless/Dataless Client

5.1   At the Main Menu, select **Exit Main Menu & Start System (Boot)** (option 4).

The Starting System (BOOT) screen displays.

5.2   Turn the key mode switch to the Normal position, and press Enter to continue booting the system.

5.3   The `Booting . . . . Please Wait` message displays and your system will begin booting. This first boot will take a number of minutes–please be patient (subsequent boots will be faster). At times you may not see any indications of activity on your screen, but the numbers in your three-digit display will be changing as the boot progresses. Eventually your screen will go blank. Then after several minutes `c31` will appear on the three-digit display.

5.4   Each terminal and direct-attached display device (or console) attached to your system will then show a message asking you to select your system console. Your console is the screen and keyboard that you will be using to manage your system.

Press the specified keys only on the keyboard you want to use as your system console.

Your system will resume the boot process.

5.5   A login prompt should display on your console when the system has finished booting (this may take a while). As booting progresses, the numbers in the three-digit display will change.

Note: During the boot process the message `Multi-user initialization completed` will display and the system will appear to be inactive for 2–3 minutes. This does not mean the system has completed booting. Please be patient, the login prompt will eventually display.

When the login prompt appears, you have completed the hardware setup of your system. You must now complete the software setup for this machine–especially your network configuration (see the following Note).

Note: Even though you can now boot from your network server, this machine is *not* yet fully configured to use the network. If you want to have full network functionality for this machine you must complete the network configuration procedures. You may also need to perform other software configuration tasks such as configuring your display and setting date and time. To complete your software setup, do one of the following:

– If you are using AIX as your operating system, you should now go to the *AIX Installation Guide*, and begin the procedures setting up the display device.

– If you want to run a non-AIX operating system on this client, you should now reset the built-in network configuration information (BOOT device on the Main Menu) so that the client will boot from the non-AIX-AIX Version 3.2 server. Then reboot the client.

Appendix A. Supplies

This appendix contains a list of supplies and the part numbers to order.

Part Number	Description
6404088	3.5-Inch 1.0M-byte Blank Diskette (box of ten)
6404083	3.5-Inch 2.0M-byte Blank Diskette (box of ten).
72X6111	3.5-Inch 4.0MB Blank Diskette (Box of 10)
21F8763	4-mm Data Tape Cartridge (5-pack)
21F8758	4-mm DDS IIII Data Tape Cartridge (5-pack)
21F8762	4-mm DDS IIII Diagnostic Cartridge
8191160	4-mm DDS 2 Data Cartridge (5-pack)
8191146	4-mm DDS 2 Diagnostic Cartridge
21F8732	1/4-Inch, 1.2 GB Data Tape Cartridge (5-pack)
21F8587	1/4-Inch, 525 MB Data Tape Cartridge (5-pack)
21F8588	1/4-Inch, 150 MB Data Tape Cartridge (5-pack)
21F8570	1/4-Inch, Cartridge Head Cleaning Kit
21F8595	8-mm Data Tape Cartridge (5-pack)
16G8467	8-mm Cleaning Tape Cartridge
0352465	1/2-Inch, Head Cleaning Kit
13F5647	Tape Cleaning Solution
33F8354	Lithium Battery

In the United States, you can order these supplies by calling toll-free **1-800-438-2468**, or you can FAX your inquiry to **1-800-522-3422**.

Appendix B. Three-Digit Display Numbers

This appendix contains lists of the various numbers and characters that may display in the three-digit display. Determine the type of operation being performed, then use the list for that type operation.

Built-In Self-Test (BIST) Indicators

100	BIST completed successfully; control was passed to IPL ROS.
101	BIST started following Reset.
102	BIST started following power-on Reset.
103	BIST could not determine the system model number.
104	Equipment conflict; BIST could not find the CBA.
105	BIST could not read from the OCS EPROM.
106	BIST failed: CBA not found
111	OCS stopped; BIST detected a module error.
112	A checkstop occurred during BIST; checkstop results could not be logged out.
113	Three checkstops have occurred.
120	BIST starting a CRC check on the 8752 EPROM.
121	BIST detected a bad CRC in the first 32K bytes of the OCS EPROM.
122	BIST started a CRC check on the first 32K bytes of the OCS EPROM.
123	BIST detected a bad CRC on the OCS area of NVRAM.
124	BIST started a CRC check on the OCS area of NVRAM.
125	BIST detected a bad CRC on the time-of-day area of NVRAM.
126	BIST started a CRC check on the time-of-day area of NVRAM.
127	BIST detected a bad CRC on the 8752 EPROM.
130	BIST presence test started.
140	Running BIST. (Box Manufacturing Mode Only)
142	Box manufacturing mode operation.
143	Invalid memory configuration.
144	Manufacturing test failure.
151	BIST started AIPGM test code.
152	BIST started DCLST test code.
153	BIST started ACLST test code.
154	BIST started AST test code.
160	Bad EPOW Signal/Power status signal.
161	BIST being conducted on BUMP I/O.
162	BIST being conducted on JTAG.
163	BIST being conducted on Direct I/O.
164	BIST being conducted on CPU.
165	BIST being conducted on DCB and Memory.
166	BIST being conducted on Interrupts.
170	BIST being conducted on Multi-Processors.
180	Logout in progress.
182	BIST COP bus not responding.
185	A checkstop condition occurred during the BIST.
186	System logic-generated checkstop (Model 250 only).
187	Graphics-generated checkstop (Model 250).
195	BIST logout completed.
199	Generic SCSI backplane.

`888`	BIST did not start.

Power-On Self-Test (POST) Indicators

`200`	IPL attempted with keylock in the Secure position.
`201`	IPL ROM test failed or checkstop occurred (irrecoverable).
`202`	Unexpected machine check interrupt.
`203`	Unexpected data storage interrupt.
`204`	Unexpected instruction storage interrupt.
`205`	Unexpected external interrupt.
`206`	Unexpected alignment interrupt.
`207`	Unexpected program interrupt.
`208`	Unexpected floating point unavailable interrupt.
`209`	Unexpected SVC interrupt.
`20c`	L2 cache POST error. (The display shows a solid 20c for 5 seconds.)
`210`	Unexpected SVC interrupt.
`211`	IPL ROM CRC comparison error (irrecoverable).
`212`	RAM POST memory configuration error or no memory found (irrecoverable).
`213`	RAM POST failure (irrecoverable).
`214`	Power status register failed (irrecoverable).
`215`	A low voltage condition is present (irrecoverable).
`216`	IPL ROM code being uncompressed into memory.
`217`	End of boot list encountered.
`218`	RAM POST is looking for good memory.
`219`	RAM POST bit map is being generated.
`21c`	L2 cache is not detected. (The display shows a solid 21c for 2 seconds.)
`220`	IPL control block is being initialized.
`221`	NVRAM CRC comparison error during AIX IPL(key mode switch in Normal mode). Reset NVRAM by reaccomplishing IPL in Service mode. For systems with an internal, direct-bus-attached (DBA) disk, IPL ROM attempted to perform an IPL from that disk before halting with this operator panel display value.
`222`	Attempting a Normal mode IPL from Standard I/O planar-attached devices specified in NVRAM IPL Devices List.
`223`	Attempting a Normal mode IPL from SCSI-attached devices specified in NVRAM IPL Devices List.
`224`	Attempting a Normal mode IPL from 9333 subsystem device specified in NVRAM IPL Devices List.
`225`	Attempting a Normal mode IPL from 7012 DBA disk-attached devices specified in NVRAM IPL Devices List.
`226`	Attempting a Normal mode IPL from Ethernet specified in NVRAM IPL Devices List.
`227`	Attempting a Normal mode IPL from Token-Ring specified in NVRAM IPL Devices List.
`228`	Attempting a Normal mode IPL from NVRAM expansion code.
`229`	Attempting a Normal mode IPL from NVRAM IPL Devices List; cannot IPL from any of the listed devices, or there are no valid entries in the Devices List.
`22c`	Attempting a normal mode IPL from FDDI specified in NVRAM IPL device list.

230	Attempting a Normal mode IPL from adapter feature ROM specified in IPL ROM Device List.
231	Attempting a Normal mode IPL from Ethernet specified in IPL ROM Device List.
232	Attempting a Normal mode IPL from Standard I/O planar-attached devices specified in ROM Default Device List.
233	Attempting a Normal mode IPL from SCSI-attached devices specified in IPL ROM Default Device List.
234	Attempting a Normal mode IPL from 9333 subsystem device specified in IPL ROM Device List.
235	Attempting a Normal mode IPL from 7012 DBA disk-attached devices specified in IPL ROM Default Device List.
236	Attempting a Normal mode IPL from Ethernet specified in IPL ROM Default Device List.
237	Attempting a Normal mode IPL from Token-Ring specified in IPL ROM Default Device List.
238	Attempting a Normal mode IPL from Token-Ring specified by the operator.
239	System failed to IPL from the device chosen by the operator.
23c	Attempting a normal mode IPL from FDDI specified in IPL ROM device list.
240	Attempting a Service mode IPL from adapter feature ROM.
241	Attempting a normal boot from devices specified in the NVRAM boot list.
242	Attempting a Service mode IPL from Standard I/O planar-attached devices specified in the NVRAM IPL Devices List.
243	Attempting a Service mode IPL from SCSI-attached devices specified in the NVRAM IPL Devices List.
244	Attempting a Service mode IPL from 9333 subsystem device specified in the NVRAM IPL Devices List.
245	Attempting a Service mode IPL from 7012 DBA disk-attached devices specified in the NVRAM IPL Devices List.
246	Attempting a Service mode IPL from Ethernet specified in the NVRAM IPL Devices List.
247	Attempting a Service mode IPL from Token-Ring specified in the NVRAM Device List.
248	Attempting a Service mode IPL from NVRAM expansion code.
249	Attempting a Service mode IPL from the NVRAM IPL Devices List; cannot IPL from any of the listed devices, or there are no valid entries in the Devices List.
24c	Attempting a service mode IPL from FDDI specified in NVRAM IPL device list.
250	Attempting a Service mode IPL from adapter feature ROM specified in the IPL ROM Device List.
251	Attempting a Service mode IPL from Ethernet specified in the IPL ROM Default Device List.
252	Attempting a Service mode IPL from Standard I/O planar-attached devices specified in the ROM Default Device List.
253	Attempting a Service mode IPL from SCSI-attached devices specified in the IPL ROM Default Device List.
254	Attempting a Service mode IPL from 9333 subsystem device specified in the IPL ROM Devices List.
255	Attempting a Service mode IPL from 7012 DBA disk-attached devices specified in IPL ROM Default Device List.
256	Attempting a Service mode IPL from Ethernet specified in the IPL ROM Devices List.

257	Attempting a Service mode IPL from Token-Ring specified in the IPL ROM Devices List.
258	Attempting a Service mode IPL from Token-Ring specified by the operator.
259	Attempting a Service mode IPL from FDDI specified by the operator.
25c	Attempting a service mode IPL from FDDI specified in IPL ROM device list.
260	Information is being displayed on the display console.
261	No supported local system display adapter was found.
262	Keyboard not detected as being connected to the system's keyboard port.
263	Attempting a Normal mode IPL from adapter feature ROM specified in the NVRAM Device List.
269	Stalled state - the system is unable to IPL.
270	Low Cost Ethernet Adapter (LCE) POST executing
271	Mouse and Mouse port POST.
272	Tablet Port POST.
276	10/100Mbps MCA Ethernet Adapter POST executing
277	Auto Token-Ring LANstreamer MC 32 Adapter
278	Video ROM scan POST.
279	FDDI POST.
280	3com Ethernet POST.
281	Keyboard POST executing.
282	Parallel port POST executing.
283	Serial port POST executing.
284	POWER Gt1 graphics adapter POST executing.
285	POWER Gt3 graphics adapter POST executing.
286	Token-Ring adapter POST executing.
287	Ethernet adapter POST executing.
288	Adapter card slots being queried.
289	POWER GT0 Display Adapter POST.
290	IOCC POST error (irrecoverable).
291	Standard I/O POST running.
292	SCSI POST running.
293	7012 DBA disk POST running.
294	IOCC bad TCW SIMM in slot location J being tested.
295	Graphics Display adapter POST, color or grayscale.
296	ROM scan POST.
297	System model number does not compare between OCS and ROS (irrecoverable).
298	Attempting a software IPL.
299	IPL ROM passed control to the loaded program code.
301	Flash Utility ROM test failed or checkstop occurred (irrecoverable).
302	Flash Utility ROM: User prompt, move the key to the service position in order to perform an optional Flash Update. LED 302 will only appear if the key switch is in the secure position. This signals the user that a Flash Update may be initiated by moving the key switch to the service position. If the key is moved to the service position then LED 303 will be displayed, this signals the user to press the reset button and select optional Flash Update.
303	Flash Utility ROM: User prompt, press the reset button in order to perform an optional Flash Update. LED 302 will only appear if the key switch is in the secure position. This signals the user that a Flash Update may be initiated by moving the key switch to the service position. If the key is moved to the service position LED 303 will be displayed, this signals the user to press the reset button and select optional Flash Update.
304	Flash Utility ROM IOCC POST error (irrecoverable).
305	Flash Utility ROM standard I/O POST running.

306	Flash Utility ROM is attempting IPL from Flash Update media device.
307	Flash Utility ROM system model number does not compare between OCS and ROM (irrecoverable).
308	Flash Utility ROM: IOCC TCW memory is being tested.
309	Flash Utility ROM passed control to a Flash Update Boot Image.
311	Flash Utility ROM CRC comparison error (irrecoverable).
312	Flash Utility ROM RAM POST memory configuration error or no memory found (irrecoverable).
313	Flash Utility ROM RAM POST failure (irrecoverable).
314	Flash Utility ROM Power status register failed (irrecoverable).
315	Flash Utility ROM detected a low voltage condition.
318	Flash Utility ROM RAM POST is looking for good memory.
319	Flash Utility ROM RAM POST bit map is being generated.
322	CRC error on media Flash Image. No Flash Update performed.
323	Current Flash Image is being erased.
324	CRC error on new Flash Image after Update was performed. (Flash Image is corrupted.)
325	Flash Update successful and complete.

Configuration Program Indicators

500	Querying Standard I/O slot.
501	Querying card in Slot 1.
502	Querying card in Slot 2.
503	Querying card in Slot 3.
504	Querying card in Slot 4.
505	Querying card in Slot 5.
506	Querying card in Slot 6.
507	Querying card in Slot 7.
508	Querying card in Slot 8.
510	Starting device configuration.
511	Device configuration completed.
512	Restoring device configuration files from media.
513	Restoring basic operating system installation files from media.
516	Contacting server during network boot.
517	Mounting client remote file system during network IPL.
518	Remote mount of the root and /usr file systems failed during network boot.
520	Bus configuration running.
521	**/etc/init** invoked **cfgmgr** with invalid options; **/etc/init** has been corrupted or incorrectly modified (irrecoverable error).
522	The configuration manager has been invoked with conflicting options (irrecoverable error).
523	The configuration manager is unable to access the ODM database (irrecoverable error).
524	The configuration manager is unable to access the config. rules object in the ODM database (irrecoverable error).
525	The configuration manager is unable to get data from a customized device object in the ODM database (irrecoverable error).
526	The configuration manager is unable to get data from a customized device driver object in the ODM database (irrecoverable error).
527	The configuration manager was invoked with the phase 1 flag; running phase 1 at this point is not permitted (irrecoverable error).
528	The configuration manager cannot find sequence rule, or no program name was specified in the ODM database (irrecoverable error).
529	The configuration manager is unable to update ODM data (irrecoverable error).

530	The program **savebase** returned an error.
531	The configuration manager is unable to access the **PdAt** object class (irrecoverable error).
532	There is not enough memory to continue (malloc failure); irrecoverable error.
533	The configuration manager could not find a configure method for a device.
534	The configuration manager is unable to acquire database lock (irrecoverable error).
535	HIPPI diagnostics interface driver being configured.
536	The configuration manager encountered more than one sequence rule specified in the same phase (irrecoverable error).
537	The configuration manager encountered an error when invoking the program in the sequence rule.
538	The configuration manager is going to invoke a configuration method.
539	The configuration method has terminated, and control has returned to the configuration manager.
551	IPL vary-on is running.
552	IPL varyon failed.
553	IPL phase 1 is complete.
554	The boot device could not be opened or read, or unable to dnable to define NFS swap device during network boot.
555	An ODM error occurred when trying to varyon the rootvg, or unable to create NFS swap device during network boot.
556	Logical Volume Manager encountered error during IPL vary-on.
557	The root filesystem will not mount.
558	There is not enough memory to continue the system IPL.
559	Less than 2 M bytes of good memory are available to load the AIX kernel.
570	Virtual SCSI devices being configured.
571	HIPPI common function device driver being configured.
572	HIPPI IPI-3 master transport driver being configured.
573	HIPPI IPI-3 slave transport driver being configured.
574	HIPPI IPI-3 transport services user interface device driver being configured.
575	A 9570 disk-array driver is being configured.
576	Generic async device driver being configured.
577	Generic SCSI device driver being configured.
578	Generic commo device driver being configured.
579	Device driver being configured for a generic device.
580	HIPPI TCPIP network interface driver being configured.
581	Configuring TCP/IP.
582	Configuring Token-Ring data link control.
583	Configuring an Ethernet data link control.
584	Configuring an IEEE Ethernet data link control.
585	Configuring an SDLC MPQP data link control.
586	Configuring a QLLC X.25 data link control.
587	Configuring a NETBIOS.
588	Configuring a Bisync Read-Write (BSCRW).
589	SCSI target mode device being configured.
590	Diskless remote paging device being configured.
591	Configuring an LVM device driver.
592	Configuring an HFT device driver.
593	Configuring SNA device drivers.
594	Asynchronous I/O being defined or configured.
595	X.31 pseudo-device being configured.
596	SNA DLC/LAPE pseudo-device being configured.

597	OCS software being configured.
598	OCS hosts being configured during system reboot.
599	Configuring FDDI data link control.
5c0	Streams-based hardware drive being configured.
5c1	Streams-based X.25 protocol being configured.
5c2	Streams-based X.25 COMIO emulator driver being configured.
5c3	Streams-based X.25 TCP/IP interface driver being configured.
5c4	FCS adapter device driver being configured.
5c5	SCB network device driver for FCS is being configured.
5c6	AIX SNA channel being configured.
600	Starting network boot portion of **/sbin/rc.boot**
602	Configuring network parent devices.
603	**/usr/lib/methods/defsys**, **/usr/lib/methods/cfgsys**, or **/usr/lib/methods/cfgbus** failed.
604	Configuring physical network boot device.
605	Configuration of physical network boot device failed.
606	Running **/usr/sbin/ifconfig** on logical network boot device.
607	**/usr/sbin/ifconfig** failed.
608	Attempting to retrieve the **client.info** file with **tftp**. Note that a flashing 608 indicates multiple attempt(s) to retrieve the **client_info** file are occurring.
609	The **client.info** file does not exist or it is zero length.
610	Attempting remote mount of NFS file system.
611	Remote mount of the NFS file system failed.
612	Accessing remote files; unconfiguring network boot device.
614	Configuring local paging devices.
615	Configuration of a local paging device failed.
616	Converting from diskless to dataless configuration.
617	Diskless to dataless configuration failed.
618	Configuring remote (NFS) paging devices.
619	Configuration of a remote (NFS) paging device failed.
620	Updating special device files and ODM in permanent filesystem with data from boot RAM filesystem.
622	Boot process configuring for operating system installation.
650	IBM SCSD disk drive being configured.
680	POWER GXT800M Graphics Adapter
689	4.5GB Ultra SCSI Single Ended Disk Drive being configured.
690	9.1GB Ultra SCSI Single Ended Disk Drive being configured.
694	Eicon ISDN DIVA MCA Adapter for PowerPC Systems.
700	Progress indicator. A 1.1 GB 8-bit SCSI disk drive being identified or configured.
701	Progress indicator. A 1.1 GB 16-bit SCSI disk drive is being identified or configured.
702	Progress indicator. A 1.1 GB 16-bit differential SCSI disk drive is being identified or configured.
703	Progress indicator. A 2.2 GB 8-bit SCSI disk drive is being identified or configured.
704	Progress indicator. A 2.2 GB 16-bit SCSI disk drive is being identified or configured.
705	The configuration method for the 2.2 GB 16-bit differential SCSI disk drive is being run. If an irrecoverable error occurs, the system halts.
706	Progress indicator. A 4.5 GB 16-bit SCSI disk drive is being identified or configured.
707	Progress indicator. A 4.5 GB 16-bit differential SCSI disk drive is being identified or configured.

708	Progress indicator. A L2 cache is being identified or configured.
710	POWER GXT150M graphics adapter being identified or configured.
711	Unknown adapter being identified or configured.
712	Graphics slot bus configuration is executing.
713	The IBM ARTIC960 device is being configured.
714	A video capture adapter is being configured.
715	The Ultimedia Services audio adapter is being configured. This LED displays briefly on the panel.
717	TP Ethernet Adapter being configured.
718	GXT500 Graphics Adapter being configured.
720	Unknown read/write optical drive type being configured.
721	Unknown disk or SCSI device being identified or configured.
722	Unknown disk being identified or configured.
723	Unknown CD-ROM being identified or configured.
724	Unknown tape drive being identified or configured.
725	Unknown display adapter being identified or configured.
726	Unknown input device being identified or configured.
727	Unknown async device being identified or configured.
728	Parallel printer being identified or configured.
729	Unknown parallel device being identified or configured.
730	Unknown diskette drive being identified or configured.
731	PTY being identified or configured.
732	Unknown SCSI initiator type being configured.
733	7GB 8mm tape drive being configured.
734	4x SCSI–2 640MB CD–ROM Drive.
741	1080MB SCSI Disk Drive.
745	16GB 4mm Tape Auto Loader.
748	MCA keyboard/mouse adapter being configured.
749	7331 Model 205 Tape Library.
754	1.1GB 16–bit SCSI disk drive being configured.
755	2.2GB 16–bit SCSI disk drive being configured.
756	4.5GB 16–bit SCSI disk drive being configured.
757	External 13GB 1.5M/s 1/4 inch tape being configured.
772	4.5GB SCSI F/W Disk Drive.
773	9.1GB SCSI F/W Disk Drive.
774	9.1GB External SCSI Disk Drive.
77c	Progress indicator. A 1.0 GB 16–bit SCSI disk drive being identified or configured.
783	4mm DDS–2 Tape Autoloader.
789	2.6GB External Optical Drive.
794	10/100MB Ethernet PX MC Adapter.
797	Turboways 155 UTP/STP ATM Adapter being identified or configured.
798	Video streamer adapter being identified or configured.
800	Turboways 155 MMF ATM Adapter being identified or configured.
803	7336 Tape Library Robotics being configured.
804	8x Speed SCSI-2 CD ROM being configured.
807	SCSI Device Enclosure being configured.
808	System Interface Full configuration process.
80c	SSA 4–Port Adapter being identified or configured.
811	Processor complex being identified or configured.
812	Memory being identified or configured.
813	Battery for time-of-day, NVRAM, and so on being identified or configured, or system I/O control logic being identified or configured.
814	NVRAM being identified or configured.

815	Floating-point processor test
816	Operator panel logic being identified or configured.
817	Time-of-day logic being identified or configured.
819	Graphics input device adapter being identified or configured.
821	Standard keyboard adapter being identified or configured.
823	Standard mouse adapter being identified or configured.
824	Standard tablet adapter being identified or configured.
825	Standard speaker adapter being identified or configured.
826	Serial Port 1 adapter being identified or configured.
827	Parallel port adapter being identified or configured.
828	Standard diskette adapter being identified or configured.
831	3151 adapter being identified or configured, or Serial Port 2 being identified or configured.
834	64-port async controller being identified or configured.
835	16-port async concentrator being identified or configured.
836	128-port async controller being identified or configured.
837	16-port remote async node being identified or configured.
838	Network Terminal Accelerator Adapter being identified or configured.
839	7318 Serial Communications Server being configured.
841	8-port async adapter (EIA-232) being identified or configured.
842	8-port async adapter (EIA-422A) being identified or configured.
843	8-port async adapter (MIL-STD 188) being identified or configured.
844	7135 RADiant Array disk drive subsystem controller being identified or configured.
845	7135 RADiant Array disk drive subsystem drawer being identified or configured.
846	RAIDiant Array SCSI 1.3GB Disk Drive
847	16-port serial adapter (EIA-232) being identified or configured.
848	16-port serial adapter (EIA-422) being identified or configured.
849	X.25 Interface Co-Processor/2 adapter being identified or configured.
850	Token-Ring network adapter being identified or configured.
851	T1/J1 Portmaster adapter being identified or configured.
852	Ethernet adapter being identified or configured.
854	3270 Host Connection Program/6000 connection being identified or configured.
855	Portmaster Adapter/A being identified or configured.
857	FSLA adapter being identified or configured.
858	5085/5086/5088 adapter being identified or configured.
859	FDDI adapter being identified or configured.
85c	Progress indicator. Token-Ring High-Performance LAN adapter is being identified or configured.
861	Optical adapter being identified or configured.
862	Block Multiplexer Channel Adapter being identified or configured.
865	ESCON Channel Adapter or emulator being identified or configured.
866	SCSI adapter being identified or configured.
867	Async expansion adapter being identified or configured.
868	SCSI adapter being identified or configured.
869	SCSI adapter being identified or configured.
870	Serial disk drive adapter being identified or configured.
871	Graphics subsystem adapter being identified or configured.
872	Grayscale graphics adapter being identified or configured.
874	Color graphics adapter being identified or configured.
875	Vendor generic communication adapter being configured.
876	8-bit color graphics processor being identified or configured.

877	POWER Gt3/POWER Gt4 being identified or configured.
878	POWER Gt4 graphics processor card being configured.
879	24–bit color graphics card, MEV2
880	POWER Gt1 adapter being identified or configured.
887	Integrated Ethernet adapter being identified or configured.
889	SCSI adapter being identified or configured.
890	SCSI-2 Differential Fast/Wide and Single-Ended Fast/Wide Adapter/A.
891	Vendor SCSI adapter being identified or configured.
892	Vendor display adapter being identified or configured.
893	Vendor LAN adapter being identified or configured.
894	Vendor async/communications adapter being identified or configured.
895	Vendor IEEE 488 adapter being identified or configured.
896	Vendor VME bus adapter being identified or configured.
897	S/370 Channel Emulator adapter being identified or configured.
898	POWER Gt1x graphics adapter being identified or configured.
899	3490 attached tape drive being identified or configured.
89c	Progress indicator. A multimedia SCSI CD-ROM is being identified or configured.
901	Vendor SCSI device being identified or configured.
902	Vendor display device being identified or configured.
903	Vendor async device being identified or configured.
904	Vendor parallel device being identified or configured.
905	Vendor other device being identified or configured.
908	POWER GXT1000 Graphics subsystem being identified or configured.
910	1/4GB Fibre Channel/266 Standard Adapter being identified or configured.
911	Fibre Channel/1063 Adapter Short Wave
912	2.0GB SCSI-2 differential disk drive being identified or configured.
913	1.0GB differential disk drive being identified or configured.
914	5GB 8 mm differential tape drive being identified or configured.
915	4GB 4 mm tape drive being identified or configured.
916	Non-SCSI vendor tape adapter being identified or configured.
917	Progress indicator. 2.0GB 16-bit differential SCSI disk drive is being identified or configured.
918	Progress indicator. 2GB 16-bit single-ended SCSI disk drive is being identified or configured.
920	Bridge Box being identified or configured.
921	101 keyboard being identified or configured.
922	102 keyboard being identified or configured.
923	Kanji keyboard being identified or configured.
924	Two-button mouse being identified or configured.
925	Three-button mouse being identified or configured.
926	5083 tablet being identified or configured.
927	5083 tablet being identified or configured.
928	Standard speaker being identified or configured.
929	Dials being identified or configured.
930	Lighted program function keys (LPFK) being identified or configured.
931	IP router being identified or configured.
933	Async planar being identified or configured.
934	Async expansion drawer being identified or configured.
935	3.5-inch diskette drive being identified or configured.
936	5.25-inch diskette drive being identified or configured.
937	An HIPPI adapter is being configured.
942	POWER GXT 100 graphics adapter being identified or configured.

943	Progress indicator. 3480 and 3490 control units attached to a System/370 Channel Emulator/A adapter are being identified or configured.
944	100MB ATM adapter being identified or configured.
945	1.0GB SCSI differential disk drive being identified or configured.
946	Serial port 3 adapter is being identified or configured.
947	Progress indicator. A 730MB SCSI disk drive is being configured.
948	Portable disk drive being identified or configured.
949	Unknown direct bus-attach device being identified or configured.
950	Missing SCSI device being identified or configured.
951	670MB SCSI disk drive being identified or configured.
952	355MB SCSI disk drive being identified or configured.
953	320MB SCSI disk drive being identified or configured.
954	400MB SCSI disk drive being identified or configured.
955	857MB SCSI disk drive being identified or configured.
956	670MB SCSI disk drive electronics card being identified or configured.
957	120MB DBA disk drive being identified or configured.
958	160 MB DBA disk drive being identified or configured.
959	160MB SCSI disk drive being identified or configured.
960	1.37GB SCSI disk drive being identified or configured.
964	Internal 20GB 8mm tape drive identified or configured.
968	1.0GB SCSI disk drive being identified or configured.
970	Half-inch, 9-track tape drive being identified or configured.
971	150MB 1/4-inch tape drive being identified or configured.
972	2.3GB 8 mm SCSI tape drive being identified or configured.
973	Other SCSI tape drive being identified or configured.
974	CD-ROM drive being identified or configured.
975	Progress indicator. An optical disk drive is being identified or configured.
977	M-Audio Capture and Playback Adapter being identified or configured.
981	540MB SCSI-2 single-ended disk drive being identified or configured.
984	1GB 8–bit disk drive being identified or configured.
985	M-Video Capture Adapter being identified or configured.
986	2.4GB SCSI disk drive being identified or configured.
987	Progress indicator. Enhanced SCSI CD-ROM drive is being identified or configured.
989	200MB SCSI disk drive being identified or configured.
990	2.0GB SCSI-2 single-ended disk drive being identified or configured.
991	525MB 1/4-inch cartridge tape drive being identified or configured.
994	5GB 8 mm tape drive being identified or configured.
995	1.2GB 1/4 inch cartridge tape drive being identified or configured.
996	Progress indicator. Single-port, multi-protocol communications adapter is being identified or configured.
997	FDDI adapter being identified or configured.
998	2.0GB4 mm tape drive being identified or configured.
999	7137 or 3514 Disk Array Subsystem being configured.
D81	T2 Ethernet Adapter being configured.

Diagnostic Load Progress Indicators

Note: When a lowercase c is listed, it displays in the lower half of the seven-segment character position.

c00	AIX Install/Maintenance loaded successfully.
c01	Insert the first diagnostic diskette.
c02	Diskettes inserted out of sequence.

c03	The wrong diskette is in diskette drive.
c04	The loading stopped with a nonrecoverable error.
c05	A diskette error occurred.
c06	The **rc.boot** configuration shell script is unable to determine type of boot.
c07	Insert the next diagnostic diskette.
c08	RAM file system started incorrectly.
c09	The diskette drive is reading or writing a diskette.
c20	An unexpected halt occurred, and the system is configured to enter the kernel debug program instead of entering a system dump.
c21	The **ifconfig** command was unable to configure the network for the client network host.
c22	The **tftp** command was unable to read client's *ClientHostName*.**info** file during a client network boot.
c24	Unable to read client's *ClientHostName*.**info** file during a client network boot.
c25	Client did not mount remote miniroot during network install.
c26	Client did not mount the /**usr** file system during the network boot.
c29	The system was unable to configure the network device.
c31	Select the console display for the diagnostics. To select No console display, set the key mode switch to Normal then to Service. The diagnostic programs will then load and run the diagnostics automatically.
c32	A direct-attached display (HFT) was selected.
c33	A tty terminal attached to serial ports S1 or S2 was selected.
c34	A file was selected. The console messages store in a file.
c40	Configuration files are being restored.
c41	Could not determine the boot type or device.
c42	Extracting data files from diskette.
c43	Cannot access the boot/install tape.
c44	Initializing installation database with target disk information.
c45	Cannot configure the console.
c46	Normal installation processing.
c47	Could not create a physical volume identifier (PVID) on disk.
c48	Prompting you for input.
c49	Could not create or form the JFS log.
c50	Creating root volume group on target disks.
c51	No paging devices were found.
c52	Changing from RAM environment to disk environment.
c53	Not enough space in the **/tmp** directory to do a preservation installation.
c54	Installing either BOS or additional packages.
c55	Could not remove the specified logical volume in a preservation installation.
c56	Running user-defined customization.
c57	Failure to restore BOS.
c58	Displaying message to turn the key.
c59	Could not copy either device special files, device ODM, or volume group information from RAM to disk.
c61	Failed to create the boot image.
c62	Loading platform dependent debug files.
c63	Loading platform dependent data files.
c64	Failed to load platform dependent data files.
c70	Problem Mounting diagnostic CDROM disc.
c99	Diagnostics have completed. This code is only used when there is no console.

Debugger Progress Indicators

c20	The kernel debugger has started due to an unexpected system halt.

Flashing 888 Message Descriptions

A Crash Message (Type 102) can occur at any time. The following information describes both Crash and Diagnostic Messages.

Type 102 Message

The message type 102 contains information about a dump. See "Reading Flashing 888 Numbers" in Chapter 3 for information about reading the message out.

Crash Codes

000	Unexpected system interrupt.
200	Machine check because of a memory bus error.
201	Machine check because of a memory timeout.
202	Machine check because of a memory card failure.
203	Machine check because of a out of range address.
204	Machine check because of an attempt to write to ROS.
205	Machine check because of an uncorrectable address parity.
206	Machine check because of an uncorrectable ECC error.
207	Machine check because of an unidentified error.
208	Machine check due to an L2 uncorrectable ECC.
300	Data storage interrupt from the processor.
32x	Data storage interrupt because of an I/O exception from IOCC.
38x	Data storage interrupt because of an I/O exception from SLA.
400	Instruction storage interrupt.
500	External interrupt because of a scrub memory bus error.
501	External interrupt because of an unidentified error.
51x	External interrupt because of a DMA memory bus error.
52x	External interrupt because of an IOCC channel check.
53x	External interrupt from an IOCC bus timeout;x represents the IOCC number.
54x	External interrupt because of an IOCC keyboard check.
558	There is not enough memory to continue the IPL.
700	Program interrupt.
800	Floating point is not available.

Dump Progress Indicators

The following dump progress indicators, or dump status codes, are part of a Type 102 message.

Note: When a lowercase `c` is listed, it displays in the lower half of the seven-segment character position. The leftmost position is blank on the following codes.

`0c0`	The dump completed successfully.
`0c2`	A dump, requested by the user, is started.
`0c3`	The dump is inhibited.
`0c4`	The dump did not complete. A partial dump may be present.
`0c5`	The dump program could not access the dump device.
`0c6`	A dump to the secondary dump device was requested. Make the secondary dump device ready; then press Ctrl-Alt-Numpad2.
`0c7`	Reserved.
`0c8`	The dump function is disabled.
`0c9`	A dump is in progress.

Type 103 and 105 Messages

Message types 103 and 105 contain service information. The information should be recorded on the "Problem Summary Form" or on a blank sheet of paper.

This message contains the SRN and the location codes for up to four FRUs. The SRN is reported to the service organization and the location codes are needed by the service representative. See "Reading Flashing 888 Numbers" on page B-13 for information about the diagnostic information contained within this message.

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