7009 Compact Server

Operator Guide

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Second Edition (July 1995)

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Table of Contents

Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears 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.

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.

EC Council Directive

This product is in conformity with the protection requirements of EC Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

Neither the provider nor the manufacturer can 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 not supplied by the manufacturer.

International Electrotechnical Commission (IEC) Statement

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

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 e 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.

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 the safety notices, refer to the *System Unit Safety Information*, Order Number SA23-2652.

A *danger* notice indicates the presence of a hazard that has the potential of causing death or serious personal injury. *Danger* notices appear under the following topics on the following pages:

xiii
2-1
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 under the following topics on the following pages:

xiii
2-1
8-1
C-1.

Electrical Safety

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

DANGER

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

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

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

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

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for 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 electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

Laser Safety Information

Note: The Optical Link Card (OLC) referred to in this information is part of the Serial Optic Channel Converter assembly.

This system contains a laser product called the Optical Link Card (OLC). In the U.S., the OLC is certified as a Class 1 laser product that conforms to the requirements contained in the Department of Health and Human Services (DHHS) regulation 21 CFR Subchapter J Internationally, the OLC is certified as a Class 1 laser product that conforms to the requirements contained in the International Electrotechnical Commission (IEC) standard 825 (1984), the Verband Deutscher Elektrotechniker (VDE) standard 0837 (1986), and the CENELEC (European Committee for Electrotechnical Standardization) Harmonization Document HD 482 S1 (1988). The German testing institute VDE assigned a certificate of conformity to DIN IEC 825/VDE 0837/02.86 and CENELEC HD 482 S1/03.88: the certificate registration number is 3642.

In addition, Statens Provningsanstalt (Swedish National Testing Institute) tested and approved the OLC for use in Sweden as a Class 1 laser product and assigned the approval number SP LA 89:184. The CDRH certification label and the VDE certificate of conformity mark are located on the plastic retainer of the OLC product. Figure 1 shows the system Class 1 information label required by IEC 825.

Class 1 laser products are not considered to be hazardous. The OLC internally contains a gallium aluminum arsenide (GaAlAs) semiconductor laser diode emitting in the wavelength range of 770 to 800 nanometers. This laser diode is a Class 3B laser that is rated at 5.0 milliwatts. The design of the OLC is such that access to laser radiation above a Class 1 level during operation, user maintenance, or service conditions is prevented.

CLASS 1 LASER PRODUCT
LASER KLASSE 1
LUOKAN 1 LASERLAITE
APPAREIL A LASER DE CLASSE 1

TO IEC 825:1984/CENELEC HD 482 S1

Figure 1.   Class 1 System Information Label Required by the IEC 825 Standard

The Optical Link Card (OLC) must only be connected to another OLC or a compatible laser product. Any compatible laser product must contain the open fiber link detection and laser control safety system used in OLC. This is a requirement for correct operation of the optical link. In addition, the OLC product is designed and certified for use in applications with point-to-point optical links only. Using this product in any other type of optical link configuration (for example, links containing optical splitters or star couplers) is considered as not using the product correctly and may require that the user certify the laser product again for conformance to the laser safety regulations.

Power Cables and Plugs

Power Cables

To avoid electrical shock, a power cable with a grounded attachment plug is provided. Use only properly grounded outlets.

Power cables used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA). These power cords consist of:

- Electrical cables, Type SVT or SJT.

- Attachment plugs complying with National Electrical Manufacturers Association (NEMA) 5-15P. That is:

  "For 115 V operation, use a UL listed cable set consisting of a minimum 18 AWG, Type SVT or SJT three-conductor cord a maximum of 15 feet in length and a parallel blade grounding type attachment plug rated at 15 A, 125 V."

  "For 230 V operation in the United States, use a UL listed cable set consisting of a minimum 18 AWG, Type SVT or SJT three-conductor cable a maximum of 15 feet in length, and a tandem blade, grounding type attachment plug rated at 15 A, 250 V."

- Appliance couplers complying with International Electrotechnical Commission (IEC) Standard 320, Sheet C13.

Power cables used in other countries consist of the following:

- Electrical cables, Type HD21.

- Attachment plugs approved by the appropriate testing organization for the specific countries where they are used.

  "For units set at 230 V (outside of U.S.), use a cable set consisting of a minimum 18 AWG cable and grounding type attachment plug rated 15 A, 250 V. The cable set should have the appropriate safety approvals for the country in which the equipment will be installed and should be marked 'HAR'."

Power Cables and Plugs
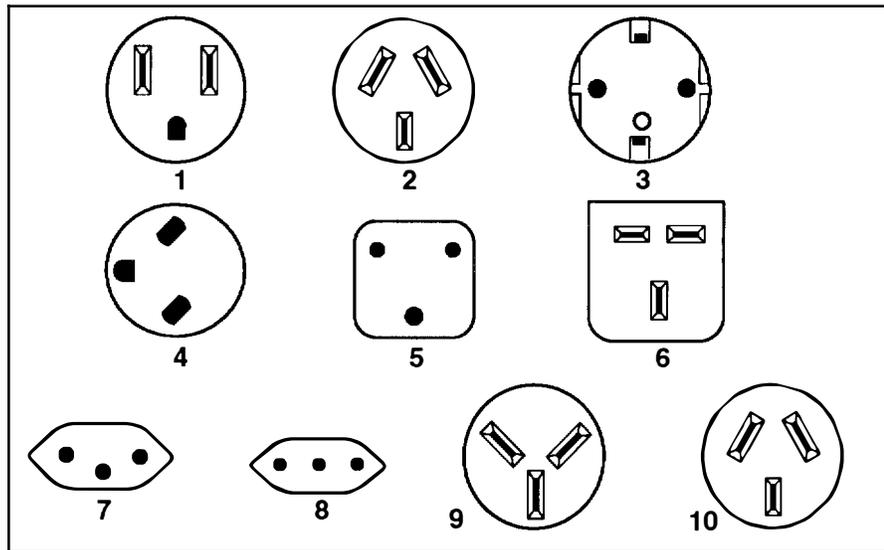
Part Number	Country	Index
62X0663	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Puerto Rico, Saudi Arabia, Suriname, Trinidad, Taiwan, U.S.A., Venezuela	1
13F9940	Argentina, Australia, New Zealand,	2
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	3
13F9997	Denmark	4
14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka	5
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	6
14F0051	Liechtenstein, Switzerland	7
14F0069	Chile, Ethiopia, Italy	8
14F0087	Israel	9
13F9939	Paraguay, Colombia, Uruguay	10

About This Book

This book provides information about the installation and operation of the 7009 Compact Server and associated devices.

Related Information

The *7009 Compact Server Hardware Setup Procedure*, Order Number SA23-2717, is a pictorial guide designed to help you quickly set up your 7009 system unit.

The *7009 Compact Server Service Guide*, Order Number SA23-2716 provides 7009 maintenance procedures and service information for trained service personnel.

The *AIX Installation Guide*, Order Number SC23-2550, provides AIX installation and configuration instruction.

The *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 *Problem Solving Guide and Reference.* If the problem is hardware related, use this manual.

The *POWERstation and POWERserver Common Diagnostics Information Manual*, Order Number SA23-2665, provides common service information for trained service personnel

The *Adapters, Devices, and Cable Information*, Order Number SA23–2764, contains reference information about adapters, devices, and cabling for the system units for trained service personnel.

Chapter 1. System Startup

Before starting the procedures in this chapter, ensure that:

- Any additional memory, optional adapters, media drives, and disk drives are installed, and the external SCSI connector is either disabled or enabled as you require. (The system unit arrives from the factory with the SCSI connector *enabled*.) If any of these requirements are not completed, go to Chapter 2.

- All external devices are connected. If they are not, go to the *7009 Compact Server Hardware Setup Procedure*, Order Number SA23-2717.

Step 1. Preparation

1. Make sure that the proper level of AIX is available:

   - The 7009 Model C10 requires AIX Version 3.2.5 plus enhancements to support PowerPC models, or a higher version of AIX.

   - The 7009 Model C20 requires AIX Version 4.1.3 or higher.

2. Decide which type of system you will create:

   ☐ **Standard**   Your system unit starts up using one of its own disk drives.

   ☐ **Dataless**   Your system unit starts up using a network boot server.

3. Open the door.
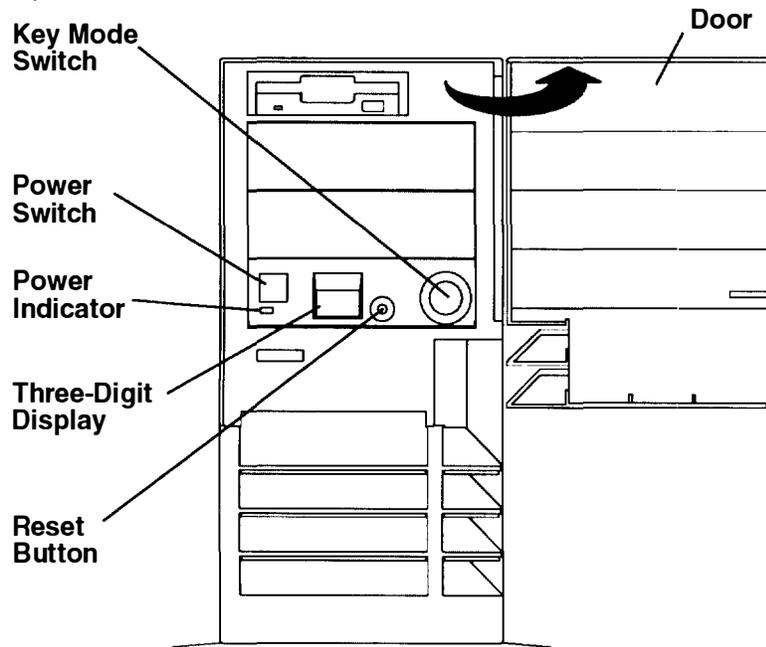
4. Set the system unit power switch to the Off position. The switch is On when pushed in and off when even with the front cover.

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

6. If you will create a **standard** system and the correct version of AIX is *not* installed on a disk inside your system unit, go to the *AIX Installation Guide* and follow the installation instructions there. Afterward, if you want to run diagnostics, return to Chapter 6 of this book.

7. If you will create a **dataless** system, go to Step 3, "Setting Up a Dataless System."

Step 2. Starting the System

1. Set the key mode switch to the Normal position.
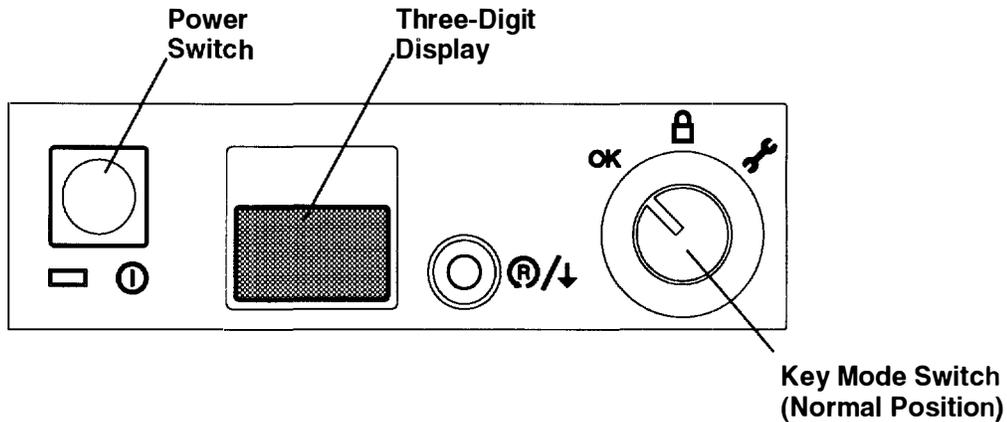
Power Switch   **Three-Digit Display**

Key Mode Switch (Normal Position)

2. Turn on the system unit. If the power indicator does not light, make sure the power cord is connected to the system unit and to a working, grounded outlet. If the power indicator still does not light, go to Step 6 on page 7-2.

3. Your system unit should now perform a normal initial program load (IPL).

   - If you are using an ASCII terminal and garbled text appears on the screen, make sure your ASCII terminal settings are the same as described in "General Attributes Always Required" on page 4-6 and "Additional Communication Attributes" on page 4-8

   - If you are using an ASCII terminal and the number 261 or 262 displays in the three-digit display, press one of the number keys on your keyboard.

   - If a login prompt does not appear on your display or ASCII terminal, go to the *Problem Solving Guide and Reference*.

4. Your Compact Server is now ready to use.

   - To establish a network connection, refer to the *AIX Installation Guide*.

   - If you want to run diagnostics, go to Chapter 6 of this book, "System Unit Verification Procedure."

Step 3. Setting Up a Dataless System

1. Set the key mode switch to the Secure position.
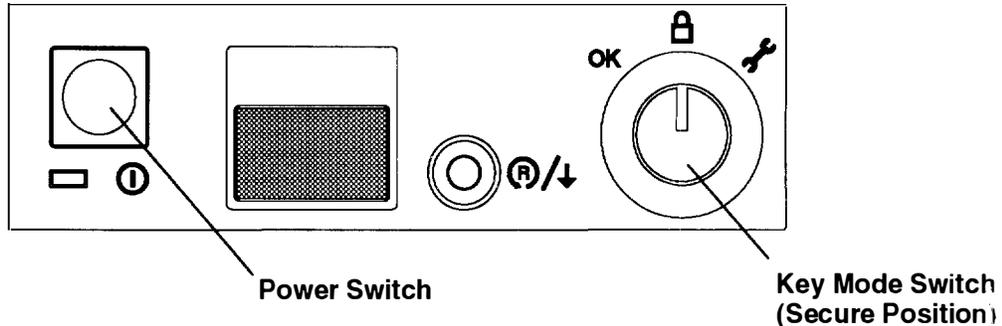
Power Switch

**Key Mode Switch
(Secure Position)**

2. Turn on the system unit. If the power indicator does not light, make sure the power cord is connected to the system unit and to a working, grounded outlet. If the power indicator still does not light, go to Step 6 on page 7-2.

3. Wait for 200 to appear in the three-digit display, then continue.

4. Set the key mode switch to the Service position, then press the Reset button within five seconds.

Reset Button   **Key Mode Switch
(Service Position)**
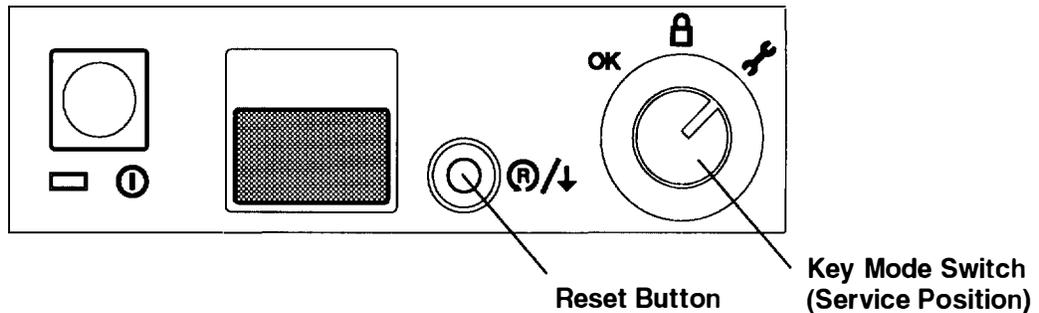
5. What happens next depends on how your system is configured:

- If the Select Language menu displays, select the language you want to use in these menus. The screen will change to display the language you selected. Enter 99 to return to the Main Menu.

- If the Main Menu displays, go to Step 4, "Setting Up Network Configuration."

- If you are using an ASCII terminal and the number 261 or 262 displays in the three-digit display, press one of the number keys on your keyboard and go to Step 4, "Setting Up Network Configuration."

- If the number 261 or 262 does *not* display, ensure that the power cord for the system unit (and ASCII terminal, if installed) is plugged into a grounded outlet. If this does not solve the problem, consult your *Problem Solving Guide and Reference*.

Step 4. Setting Up Network Configuration

```
Main Menu


1.  Select BOOT (Startup) Device
2.  Select Language for these Menus
3.  Send Test Transmission (PING)
4.  Show Hardware Configuration
5.  Perform Built-In Diagnostics
6.  Exit Main Menu and Start System (BOOT)




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

1. From the Main Menu, select the `Select BOOT (Startup) Device` option (1) and press Enter. The Select BOOT (Startup) Device menu should display.

2. If you are booting over:

    • Token-Ring, go to substep 3.

    • Ethernet, go to substep 4.

3. For each Token-Ring adapter, you have two options: 16Mb or 4Mb 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.

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

5. The Set or Change Network Addresses screen should display. Ask your system administrator if you need to enter any addresses.

    a. Type the number in front of each address you want to enter and then enter the address.

    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.`

    b. Do *not* enter `99` when you have finished adding addresses.

6. Locate the line on the screen that begins with `Hardware Address.` Record the hardware address in the space below.

    Hardware address _____.

7. All of the IP addresses are optional and can be left blank. You are now ready to return to the Main Menu, so enter `99`.

8. You now need to find out how much memory (RAM) is installed on your system.

    a. From the Main Menu select `Show Hardware Configuration.`

    b. When the Current Hardware Configuration screen displays:

        Enter `88.`

    c. The second page of the hardware list displays. In the space below, record the number shown for the item `Total Memory` under the Memory heading.

        Total memory _____.

    d. Enter `99` to return to the Main Menu.

9. Answer the following questions:

    Are you the administrator for the dataless boot server this client will use?

    NO   Go to Step 5, "Waiting for Client Registration on the Server," on page 1-5.

    YES   Go to the next question.

    Will this machine use AIX as its operating system?

    NO   A non-AIX operating system will be used. Go to Step 5, "Waiting for Client Registration on the Server," on page 1-5.

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

Step 5. Waiting for Client Registration on the Server

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

- The hardware address of your machine (the address you wrote down in substep 6 on page 1-4).

- The amount of memory (RAM) in your machine (the amount you recorded in substep 8c on page 1-5).

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

You must stop 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 turned on. If you do, you will not have to repeat Step 2, "Starting the System," and Step 4, "Setting Up Network Configuration," when you are ready to continue with the setup of this machine. When your server administrator informs you the client is registered, continue with Step 6, "Booting the Dataless Client."

- If your administrator cannot add your machine to the server right away and you do not want to leave the client on, set the power switch on the system unit to Off. After the client has been registered, repeat Step 2, "Starting the System," and Step 4, "Setting Up Network Configuration," and then continue with Step 6, "Booting the Diskless Client."

Step 6. Booting the Dataless Client

Note: During the following procedure the system prompts you to set the key mode switch to the Normal position. Do *not* set the key mode switch to the Normal position when this screen displays. Just press the Enter key. The system will be booted with the key mode switch in the Service position so that you can run the diagnostic programs.

1. At the Main Menu, enter the number for the `Exit Main Menu & Start System (boot)` option.

   The Starting System (BOOT) screen displays. Do *not* set the key mode switch to the Normal position.

2. Press Enter to continue booting the system.

3. The `Booting . . . . Please Wait` message displays and your system begins booting. This first boot takes a number of minutes (subsequent boots will be faster). At times, you may not see any indication of activity on your screen, but the numbers in your three-digit display will be changing as the boot progresses. Eventually, your screen goes blank; after several minutes, `c31` appears in the three-digit display.

4. Each terminal and direct-attached display device (or console) attached to your system shows 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

5. The system displays messages as it continues to boot and load the diagnostic programs.

   If the Diagnostics Operating Instructions do not display after several minutes, go to the *Problem Solving Guide and Reference.*

6. If you have not already rebooted your client machine with the key mode switch in the Normal position, set the key mode switch to the Normal position and press the yellow Reset button.

7. 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 to 3 minutes. This does not mean the system has completed booting. Please be patient, the login prompt will eventually display.

8. When the login prompt appears, you have completed the hardware setup of your system. You must now complete the software and network configuration.

   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 the 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 in "Set Up the Display Device." When the display setup is complete, the setup of your system unit is complete.

   - 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 server. Then reboot your system unit. Your system unit should be ready to use.

Step 7. Running the System Verification Procedure

If you want to verify your system setup, go to Chapter 6, "Using the System Verification Procedure."

Chapter 2. Installing Optional Features

This chapter contains instructions for installing optional features and making configuration changes. Before following any of the instructions in the rest of this chapter, read the following safety notices. After reading the safety notices, proceed to "Removing the Cover" on page 2-4, then follow the instructions for each optional feature installation or configuration change.

Safety Considerations

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

Note: For a translation of the safety notices, refer to the *System Unit Safety Information*, Order Number SA23-2652.

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.**

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> **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 with a properly grounded electrical outlet to avoid electrical shock.

Laser Safety Information

Note: The Optical Link Card (OLC) referred to in this information is part of the Serial Optic Channel Converter assembly.

This system contains a laser product called the Optical Link Card (OLC). In the U.S., the OLC is certified as a Class 1 laser product that conforms to the requirements contained in the Department of Health and Human Services (DHHS) regulation 21 CFR Subchapter J Internationally, the OLC is certified as a Class 1 laser product that conforms to the requirements contained in the International Electrotechnical Commission (IEC) standard 825 (1984), the Verband Deutscher Elektrotechniker (VDE) standard 0837 (1986), and the CENELEC (European Committee for Electrotechnical Standardization) Harmonization Document HD 482 S1 (1988). The German testing institute VDE assigned a certificate of conformity to DIN IEC 825/VDE 0837/02.86 and CENELEC HD 482 S1/03.88; the certificate registration number is 3642.

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Class 1 laser products are not considered to be hazardous. The OLC internally contains a gallium aluminum arsenide (GaAlAs) semiconductor laser diode emitting in the wavelength range of 770 to 800 nanometers. This laser diode is a Class 3B laser that is rated at 5.0 milliwatts. The design of the OLC is such that access to laser radiation above a Class 1 level during operation, user maintenance, or service conditions is prevented.

CLASS 1 LASER PRODUCT
LASER KLASSE 1
LUOKAN 1 LASERLAITE
APPAREIL A LASER DE CLASSE 1

TO IEC 825:1984/CENELEC HD 482 S1

Figure 1. Class 1 System Information Label Required by the IEC 825 Standard

The Optical Link Card (OLC) must only be connected to another OLC or a compatible laser product. Any compatible laser product must contain the open fiber link detection and laser control safety system used in OLC. This is a requirement for correct operation of the optical link. In addition, the OLC product is designed and certified for use in applications with point-to-point optical links only. Using this product in any other type of optical link configuration (for example, links containing optical splitters or star couplers) is considered as not using the product correctly and may require that the user certify the laser product again for conformance to the laser safety regulations.

Handling Static-Sensitive Devices

Warning: Adapters, system planars, diskette drives, media drives, disk drives, CPU cards, and SIMMs are sensitive to static electricity discharge. These devices are wrapped in antistatic bags, as shown in this illustration, to prevent this damage.

Take the following precautions:

- If you have an antistatic wrist strap available, use it while handling the device.

- Do not remove the device from the antistatic bag until you are ready to install the device in the system unit.

- With the device still in its antistatic bag, touch it to a metal frame of the system.

- Grasp cards and planars by the edges. Hold drives by the frame. Avoid touching the solder joints or pins.

- If you need to lay the device down while it is out of the antistatic bag, lay it on the antistatic bag. Before picking it up again, touch the antistatic bag and the metal frame of the system unit at the same time.

- Handle the devices carefully in order to prevent permanent damage.

Antistatic Bag
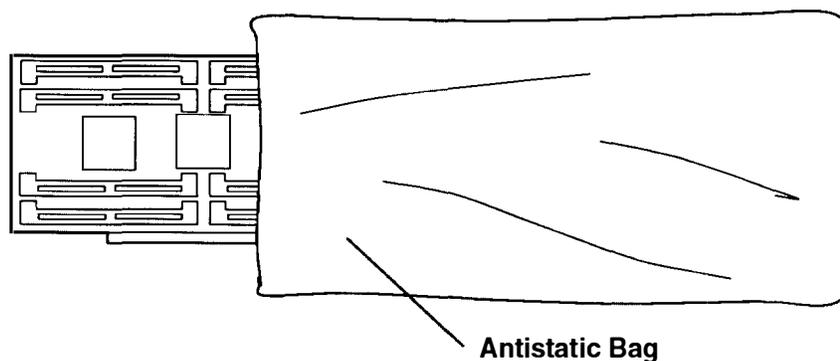
Installing a Serial Dual-Port Cable

If the only option you will install is a serial dual-port cable, you can do so now without removing the cover of your Compact Server.

Serial Connector

Serial Dual-Port Cable

S1

S2
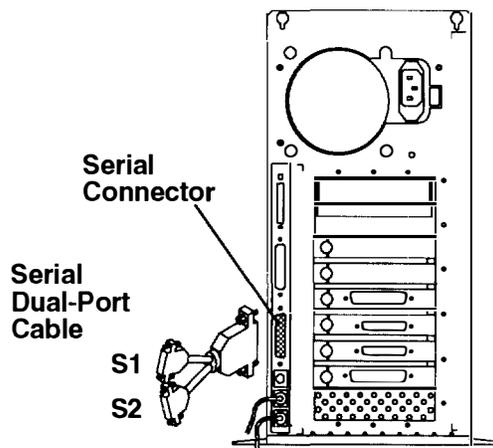
Removing the Cover

1. Shut down the system unit:

   a. Enter the shutdown command for your operating system. Failure to do so may result in loss of data. If you need information on the shutdown procedure for your operating system, refer to your operating system documentation.

   b. After you shut down the operating system, set the power switches of the attached devices to Off.

   c. Turn off the system unit.

2. Set the key mode switch to the Service position.
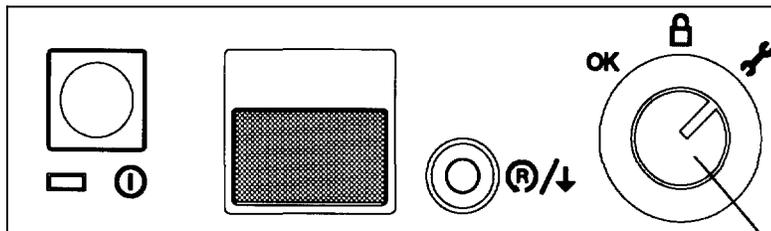
Key Mode Switch (Service Position)

3. Remove the keys (if present) and set them in a safe place.

4. Close the operator door.

5. Unplug the system unit power cable and attached device power cables from electrical outlets.

6. To remove the cover, pull forward on the bottom of the front while steadying the pedestal.
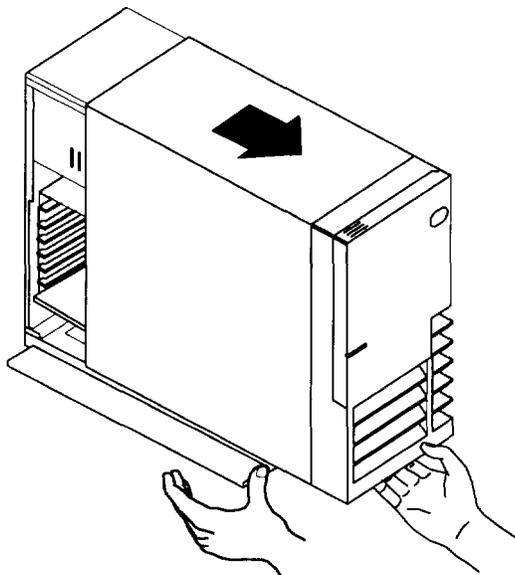
7. If your system unit contains an optional Fast/Wide SCSI adapter connected to internal SCSI devices, then do the following:

    a. Unplug the internal Fast/Wide SCSI cable from the Fast/Wide SCSI adapter
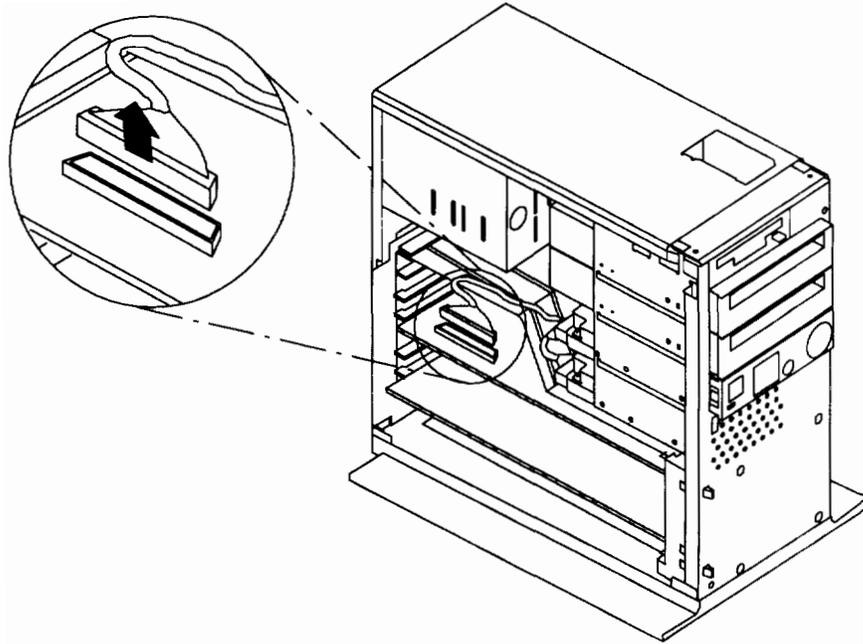
    b. Remove the Fast/Wide SCSI cable from the notch in the airflow baffle.
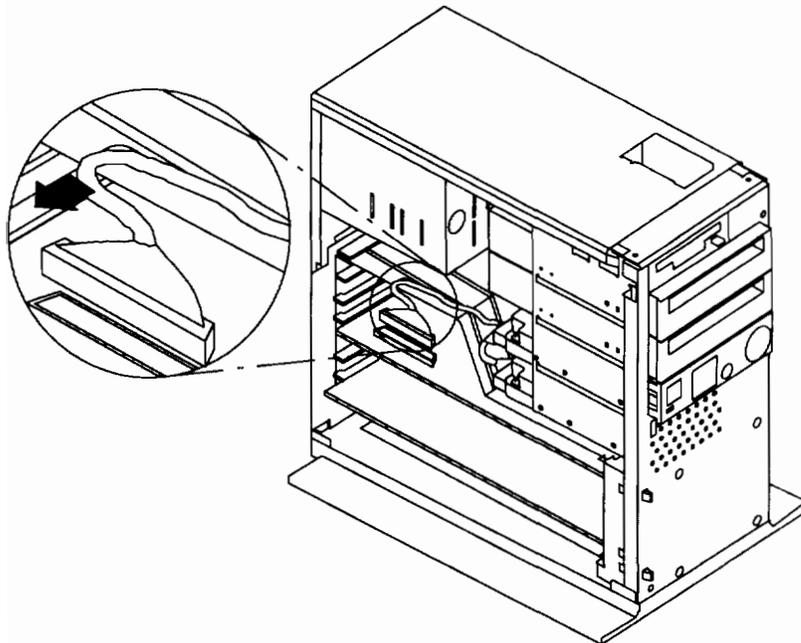
8. Remove the airflow baffle.

   Warning: The airflow baffle must be installed before replacing the cover. Failure to replace the airflow baffle could result in damage to the system unit.

System Unit Locations

Power Supply

System Planar (Behind Adapters and Disk Drives)

Optional Adapter Slots

CPU Card

Disk Drives

Diskette Drive

CD-ROM or Media Drive

Optional Media Drive

Operator Panel
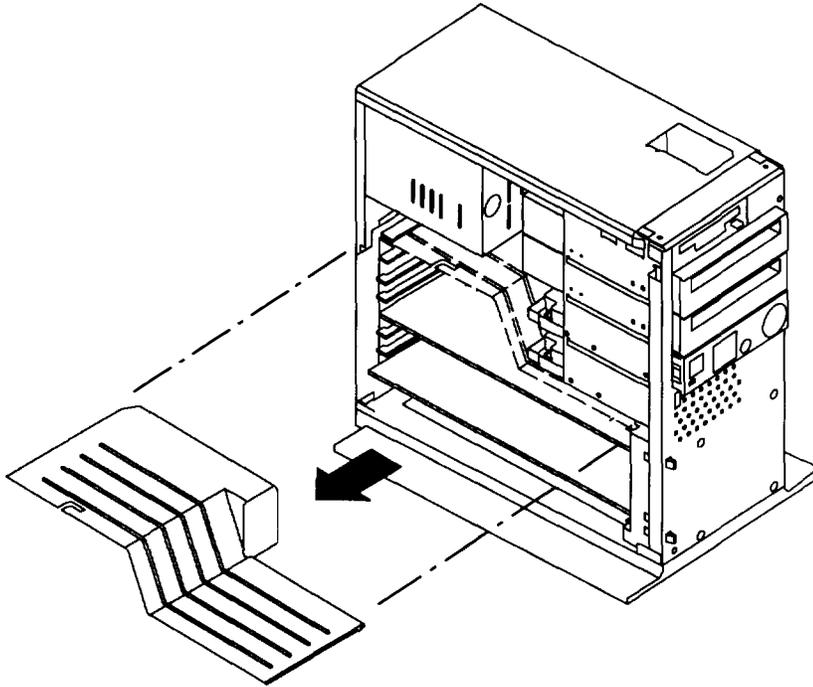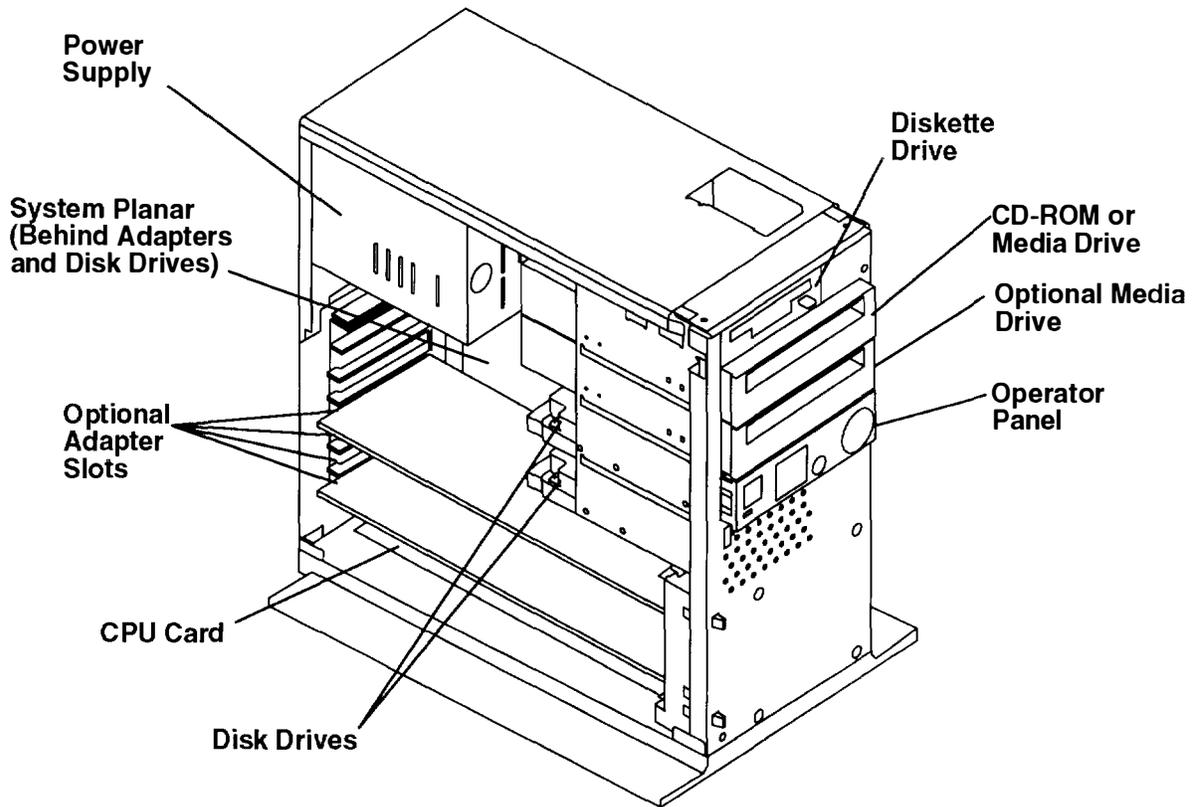
Option List

If you have more than one procedure to perform, do them in the order listed:

- "Installing Memory" on page 2-8.
- "Disabling/Enabling the SCSI Connector" on page 2-13.
- "Installing a Diskette Drive" on page 2-14.
- "Installing a Media Drive" on page 2-16.
- "Installing a Disk Drive" on page 2-20.
- "Installing a CPU Card" on page 2-28.
- "Installing a CPU Feature Card" on page 2-32.
- "Installing an Optional Adapter" on page 2-33.

Installing Memory

The 7009 system unit supports 2MB, 4MB, 8MB, 16MB, and 32MB single inline memory modules (SIMMs).

Note: At least 16M-bytes of memory must be installed. Each SIMM in a set of four must be the same capacity.

1. If you have not already done so:

   a. Read the safety notices beginning on page 2-1.

   b. Remove the cover as described in "Removing the Cover" on page 2-4.

2. Locate the SIMM slots. When you are facing the open side of the system unit, the SIMM slots are in the lower right-hand corner of the system planar (behind any installed adapters).

Lower Disk Drive Position
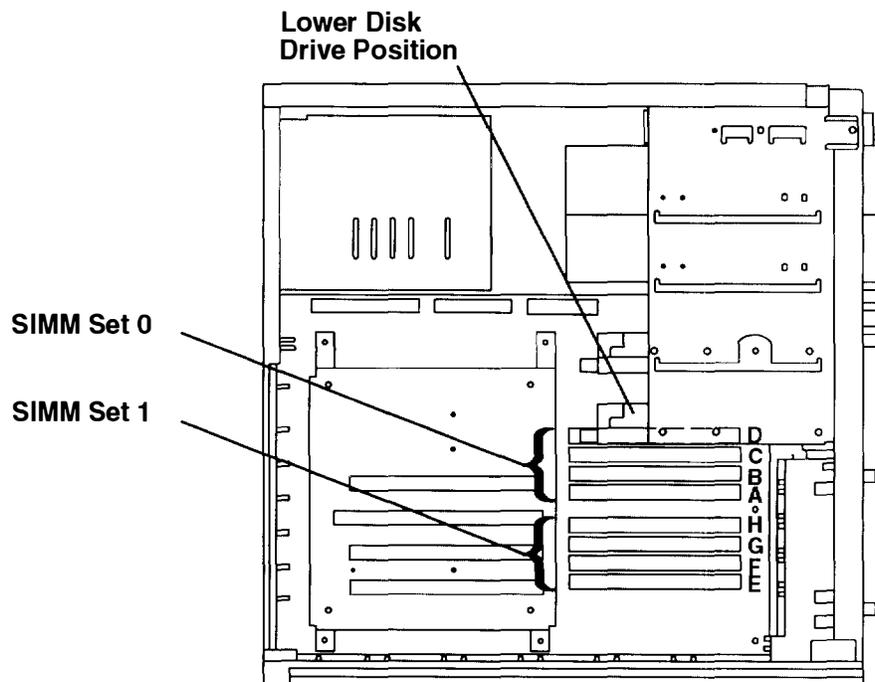
SIMM Set 0

SIMM Set 1

3. Are you replacing SIMM set 0?

   NO   Go to step 5.

   YES   If a disk drive is installed in the lower disk drive position, continue to step 4 to remove the disk drive. If a disk drive is not installed in the lower disk drive position, go to step 5.

4. To remove the lower disk drive:

   a. Carefully disconnect the internal SCSI cable from the rear of the lower disk drive using the plastic cable pull attached to the connector.

      Disconnect the power supply cable from the rear of the disk drive.
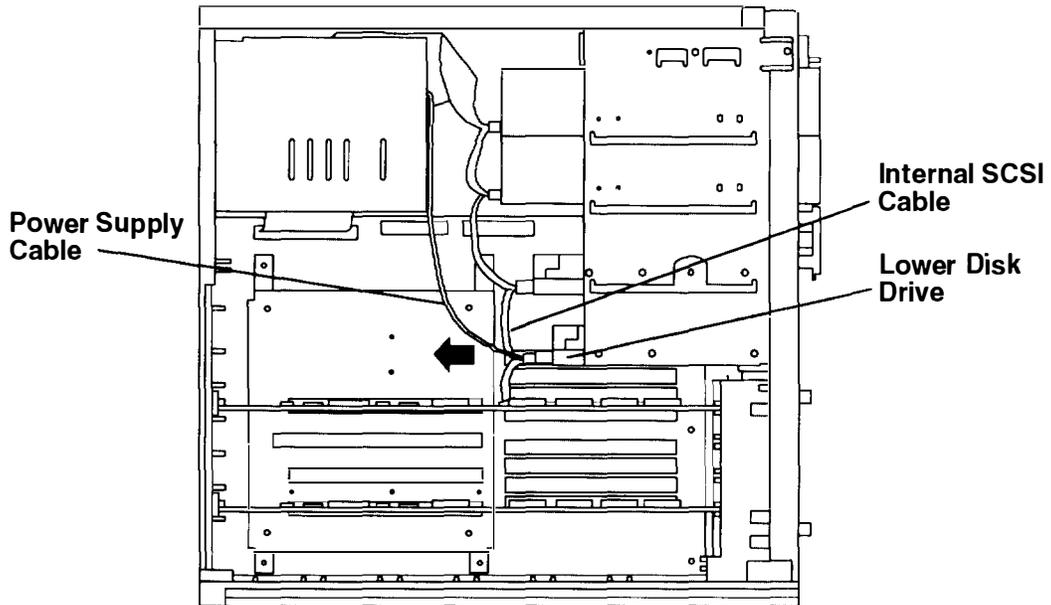
   b. Remove the three screws that secure the lower disk drive to the chassis.
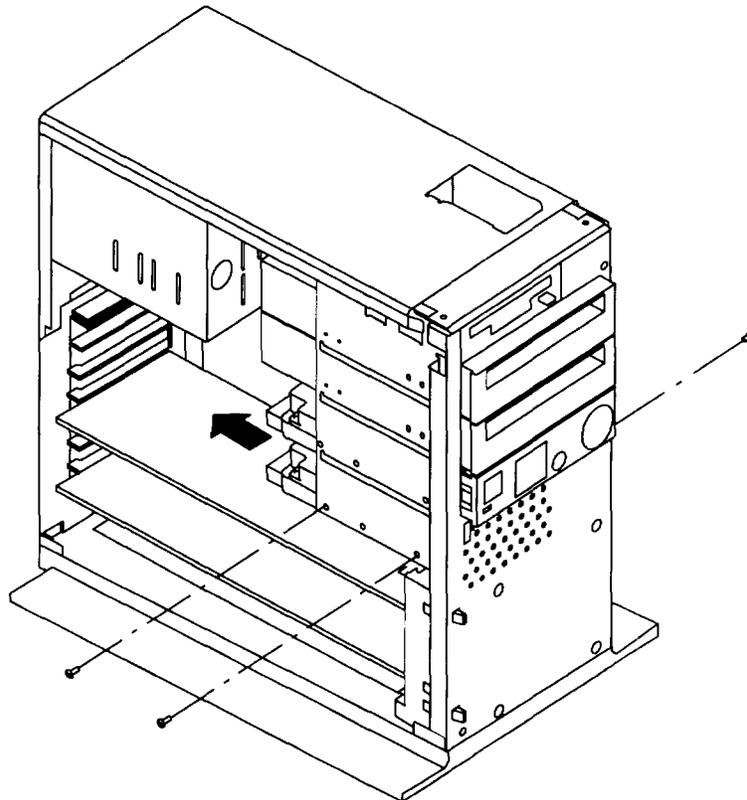
   c. Carefully slide the lower disk drive to the rear and remove it from the chassis

5. If any adapters are installed, remove the external cables attached to them.

6. Gently lay the 7009 system unit down so that the open side faces upward
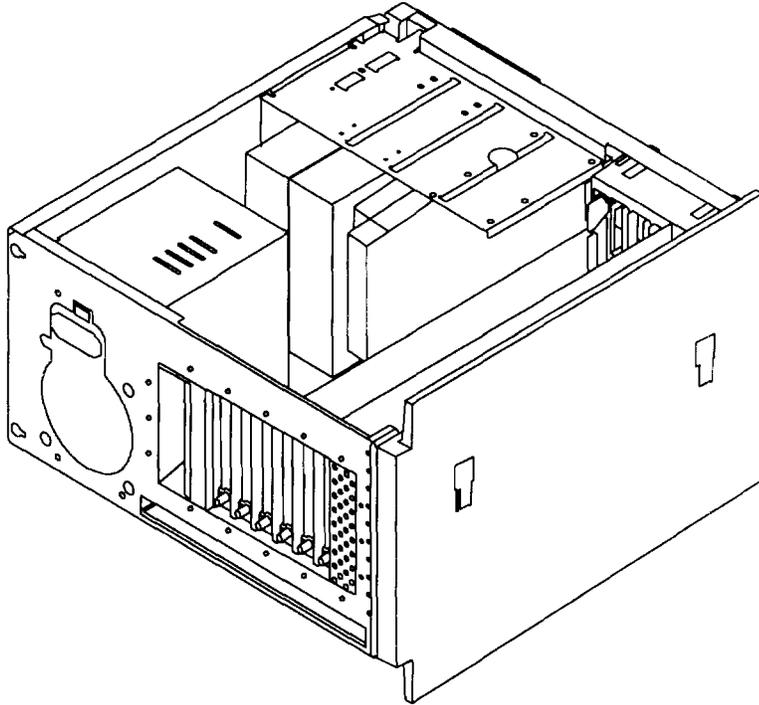
7. If no adapters are installed, skip to step 8. If adapters are installed, remove them now

   a. Loosen the serrated knobs on all of the slots containing adapters.

Serrated Knobs
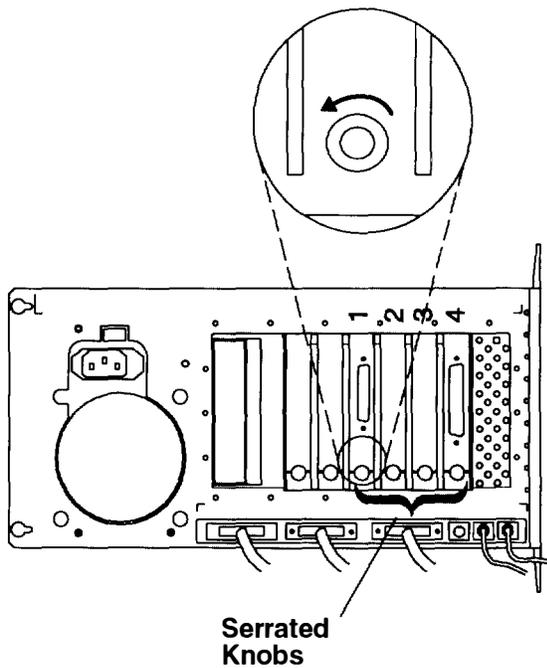
b. Remove each adapter from the system unit by pulling upward. Be sure to follow proper electrostatic discharge precautions (see page 2-3) while removing and setting aside each adapter.
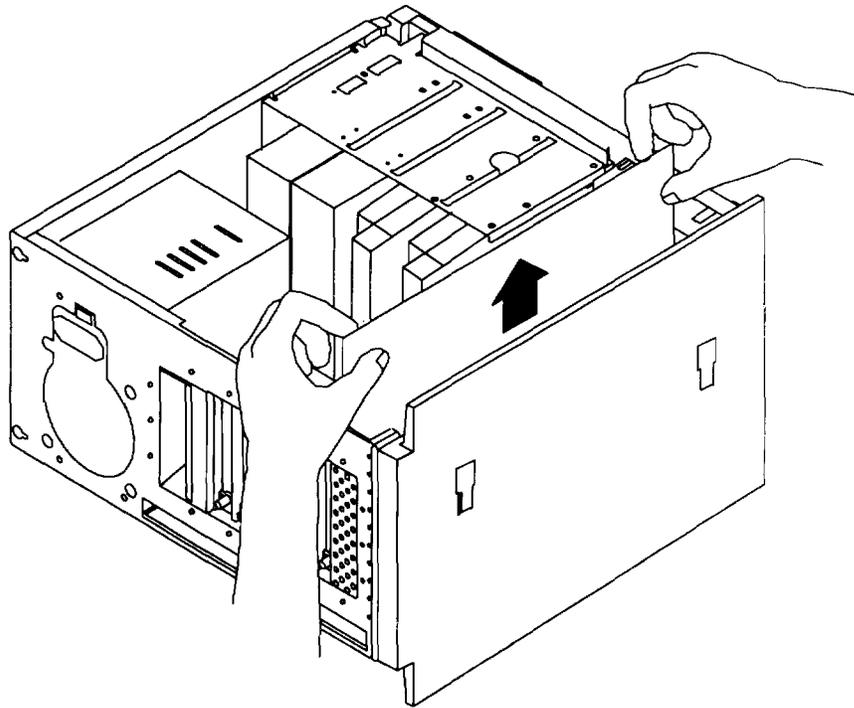
8. If you need to remove previously installed SIMMs:

a. Within the set of four SIMMs, start with the SIMM closest to the top of the system unit. Press the locking tabs outward.

Press Tabs Outward
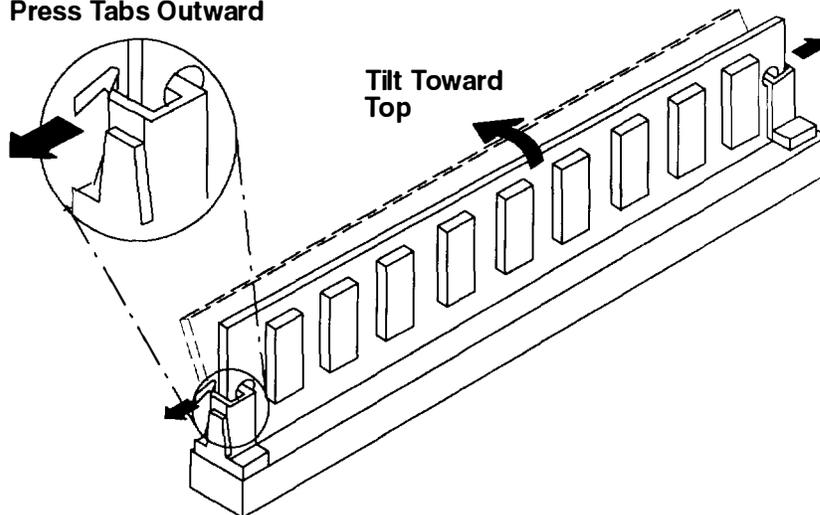
Tilt Toward Top

b. Tilt the SIMM toward the top of chassis and pull it out of the socket.

9. To install new SIMMs, turn the SIMM so that the notch is to the right (closest to the front of the system unit).

Notch to Right
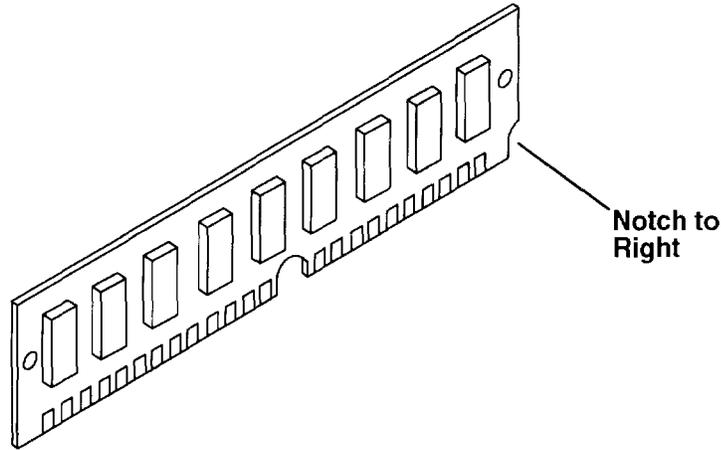
10. Starting with the lowest slot in the set of four SIMMs, insert a SIMM at an angle and tilt the SIMM upright until the locking tabs snap into place to hold the SIMM.

   Repeat this step until you have installed the complete set of four matching SIMMs. Install the SIMMs from bottom to top within the set so each SIMM will not interfere with the others when tilted into position.

Tilt Toward Bottom
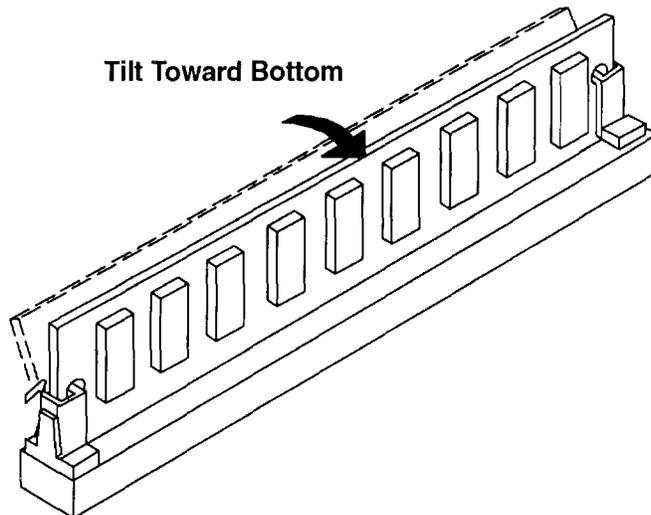
11. Replace the lower disk drive if you have removed it. Refer to "Installing a Disk Drive" on page 2-20 for instructions.

12. Replace any adapters you have removed. Refer to "Installing an Optional Adapter" on page 2-33 for instructions.

Do you have any other options to install?

NO   Go to page 2-37 and replace the cover as described in "Replacing the Cover."

YES   Refer to the "Option List" on page 2-7.

Disabling/Enabling the SCSI Connector

Five jumpers on the system planar (when set to the disabled position) provide data security by preventing communication through the external SCSI connector. The default setting of the jumpers is SCSI connector *enabled*. To change the SCSI jumper setting:

1. If you have not already done so, remove the cover as described in "Removing the Cover" on page 2-4.

2. Gently lay the system unit down so that the open side faces upward.
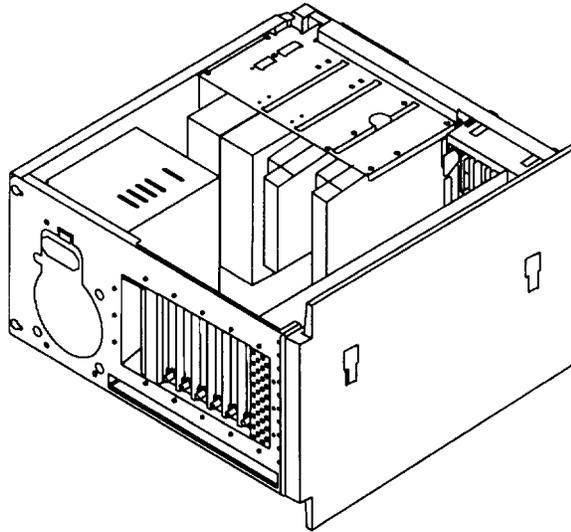
3. Locate the five SCSI enable/disable jumpers on the system planar. Remove all five jumpers, then place them all back on the pins in the SCSI enabled or SCSI disabled position as shown.
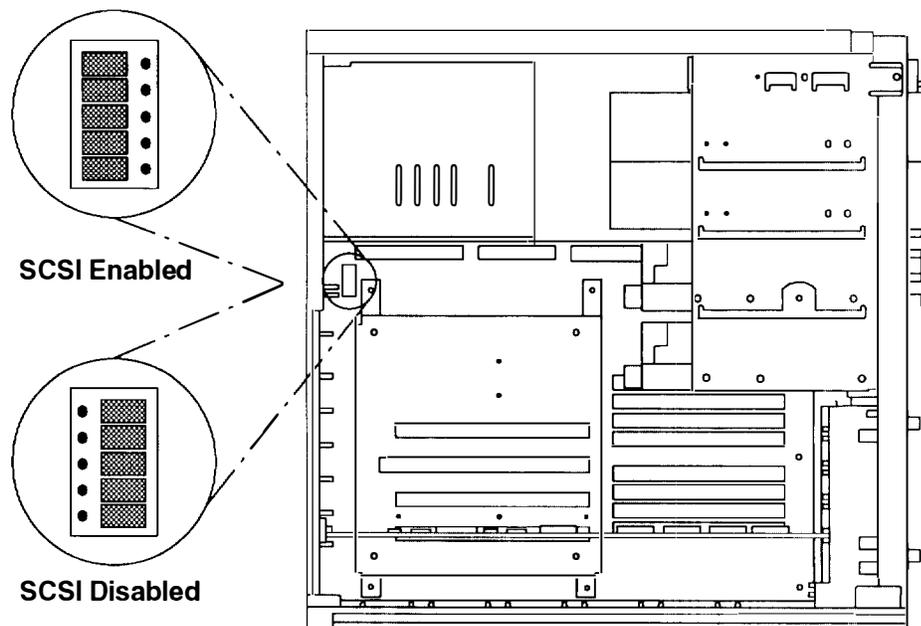
SCSI Enabled

SCSI Disabled

Do you have any other options to install?

NO   Go to page 2-37 and replace the cover as described in "Replacing the Cover."

YES   Refer to the "Option List" on page 2-7.

Installing a Diskette Drive

Use the following instructions for installing a diskette drive.

1. If you have not already done so:

    a. Read the safety notices beginning on page 2-1.

    b. Remove the cover as described in "Removing the Cover" on page 2-4.

2. Place the diskette drive on the mounting rails in the diskette drive position

Diskette Drive Mounting Rails

Diskette Drive

Screw Holes
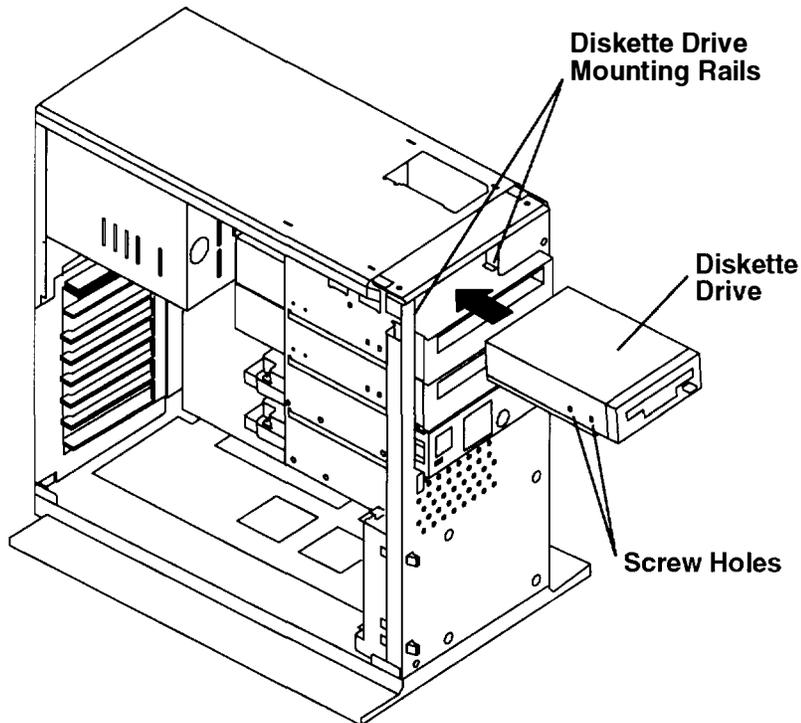
3. Ensure that the diskette drive cable is attached to the system planar, then attach the other end of the cable to the back of the diskette drive.

Diskette Drive Cable

Diskette Drive Cable Connector

4. Slide the diskette drive into the system unit until the screw holes on the side of the diskette drive line up with the holes indicated in the illustration.

Diskette Mounting Screw Holes

5. Insert and tighten the two screws that hold the diskette drive inside the system unit

Do you have any other options to install?

NO   Go to page 2-37 and replace the cover as described in "Replacing the Cover."

YES   Refer to the "Option List" on page 2-7.

Installing a Media Drive

Note: For a translation of this notice, see *System Unit Safety Information.* This caution only applies to the CD-ROM drive.

CAUTION:
A class 3 laser may be contained in the device. Do not attempt to operate the drive while it is disassembled. Do not attempt to open the covers of the drive as it is not serviceable and is to be replaced as a unit.

The 7009 system unit provides two media positions above the control panel on the front of the system unit. To install a media drive:

1. If you have not already done so:

   a. Read the safety notices beginning on page 2-1.

   b. Remove the cover as described in "Removing the Cover" on page 2-4.

2. Determine whether you will install the media drive in the upper media position or the lower media position.

3. Set the SCSI address of the media drive. Consult the media drive documentation for instructions.

   Note: SCSI address 5 is recommended for a media drive in the upper media position. SCSI address 6 is recommended for a media drive in the lower media position.

   Refer to the SCSI address record in Appendix A to make sure that the address you assign is unique.

4. Place the media drive on the mounting rails in the media position you have chosen.
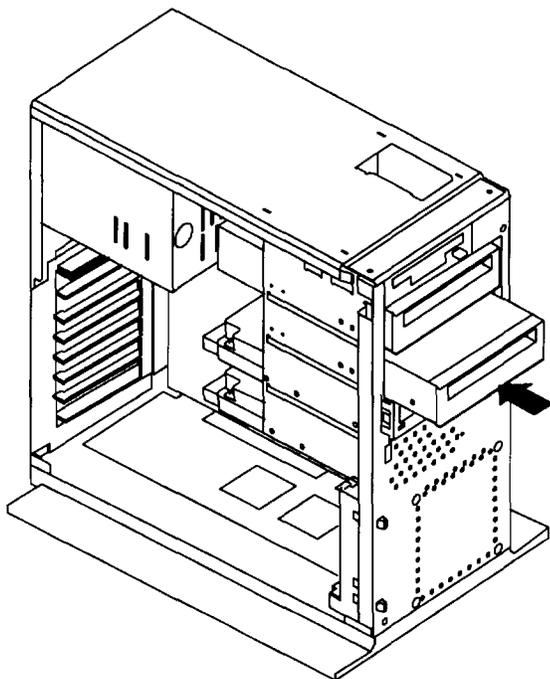
5. Locate the connector on the internal SCSI cable that corresponds to the position in which you have installed the media drive. Connect the internal SCSI cable to the back of the media drive.

Internal SCSI Cable
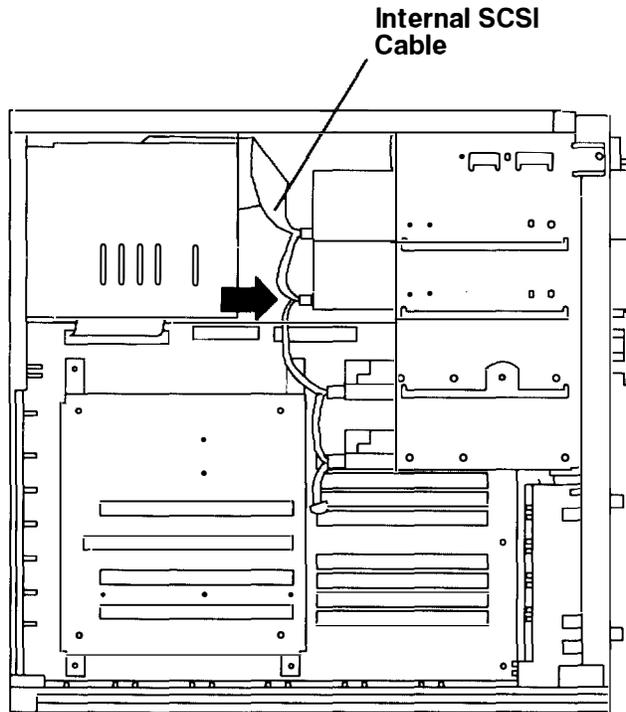
6. Locate an unused power supply cable of appropriate length and attach it to the power connector on the back of the media drive. If no unused power supply cables are long enough to reach the new media drive, exchange an unused power supply cable with a longer power supply cable already attached to a drive.

7. Carefully slide the media drive into the system unit until the screw holes on the side of the media drive line up with the holes in the side of the chassis.

8. Insert and tighten the four screws that hold the media drive inside the system unit.

9. If no SCSI devices are connected to the external SCSI connector, then make sure the system unit SCSI terminator (Part Number 51G7737) is inserted into the system unit SCSI connector.

SCSI Connector

**System Unit
SCSI Terminator**

10. Open the door on the system unit cover and locate the cover plates (if installed).
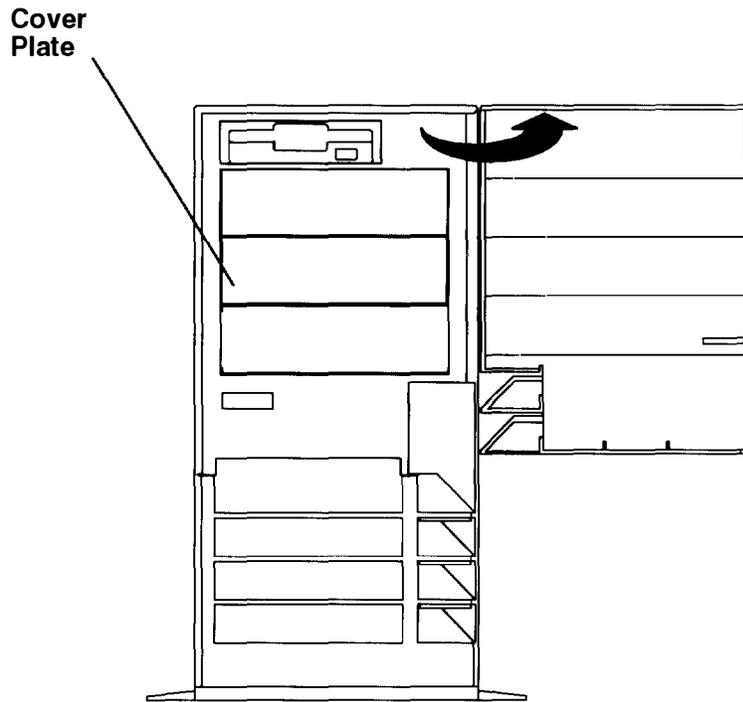
**Cover
Plate**

If a cover plate will block the media drive when you replace the system unit cover, then remove the two screws that secure the cover plate, then remove the cover plate

Back View of Cover

Cover Plate

**Cover Plate
Screws**
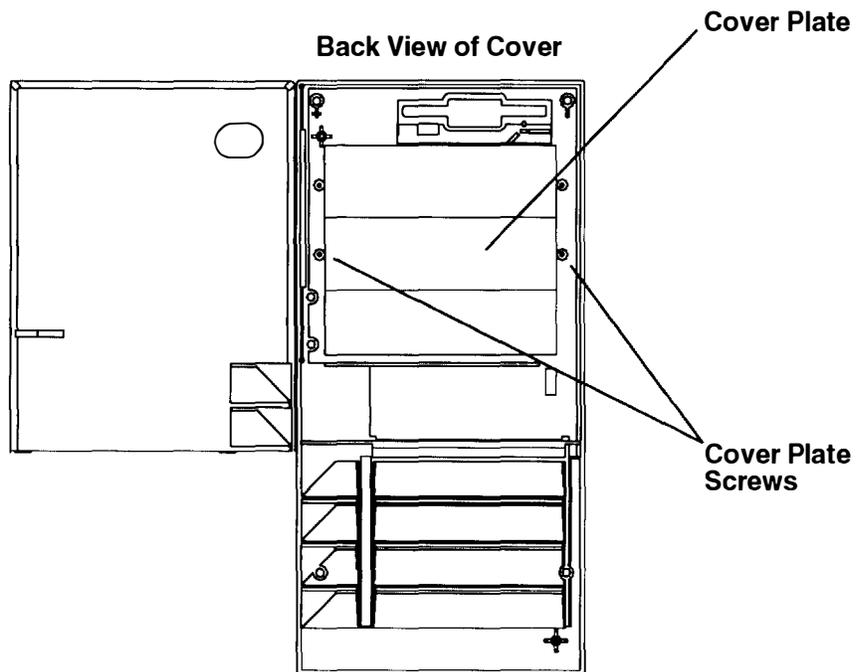
Do you have any other options to install?

NO   Replace the cover as described in "Replacing the Cover" on page 2-37.

Installing a Disk Drive

Note: To install a disk drive, you will need a screw starter.

1. If you have not already done so:

   a. Read the safety notices beginning on page 2-1.

   b. Remove the cover as described in "Removing the Cover" on page 2-4.

2. The 7009 system unit supports disk drives in the lower disk drive position, the upper disk drive position, or (with mounting brackets) in the upper and lower media position. Check the position in which you will install the new disk drive.

   ☐ **Upper Media Position**

   ☐ **Lower Media Position**

   ☐ **Upper Disk Drive Position**

   ☐ **Lower Disk Drive Position**

3. Are you replacing a disk drive or media drive *already installed* in the system unit?

   NO   Go to Step 8 on page 2-21.

   YES   Continue to Step 4.

4. Disconnect the cables from the rear of the disk drive or media drive you are replacing

5. Remove the screws that hold the disk drive or media drive inside the system unit.

   Note: The disk drive and media drive screws on the right side are recessed within the chassis. If necessary, move any cables aside to remove the disk drive's mounting screw.

Right Side of System Unit

Move Cables Aside

Upper Media Drive Mounting Screws

Lower Media Drive Mounting Screws

Upper Disk Drive Mounting Screw

Lower Disk Drive Mounting Screw

6. To remove a disk drive, slide the disk drive backward. To remove a media drive, slide the media drive forward out of the chassis.

7. Use the diagram on page 2-22 to help locate the SCSI address jumpers on the disk drive you are replacing. Write down the SCSI address that this disk drive used and be sure to set the new disk drive to the same address in Step 8, below.

8. Before installing a new disk drive, you must set its SCSI address. The disk drive's SCSI address is determined by jumpers on the disk drive. Find the picture that most closely matches your disk drive and set the jumpers using the table below.

   Notes:

   - The following table shows the jumper settings for each SCSI address. Before you set jumpers to assign the disk drive's SCSI address, consult the SCSI address record in Appendix A to make sure the address you assign is unique.

   - SCSI address 5 is recommended for disk drives installed in the upper media position. SCSI address 6 is recommended for disk drives installed in the lower media position. SCSI address 1 is recommended for disk drives installed in the upper disk position. SCSI address 0 is recommended for disk drives installed in the lower disk position.

   - Address 7 is usually reserved for the adapter; however, in high-availability configurations, the second adapter is usually assigned address 6.

   - An optional Fast/Wide SCSI adapter can be used with Fast/Wide SCSI disk drives, which use Jumper 3 to set SCSI addresses up to 15.

SCSI Address	Jumper 3	Jumper 2	Jumper 1	Jumper 0
0	Off	Off	Off	Off
1	Off	Off	Off	On
2	Off	Off	On	Off
3	Off	Off	On	On
4	Off	On	Off	Off
5	Off	On	Off	On
6*	Off	On	On	Off
7*	Off	On	On	On
8	On	Off	Off	Off
9	On	Off	Off	On
10	On	Off	On	Off
11	On	Off	On	On
12	On	On	Off	Off
13	On	On	Off	On
14	On	On	On	Off
15	On	On	On	On

SCSI
Connector
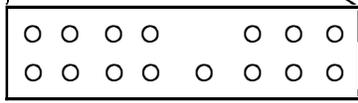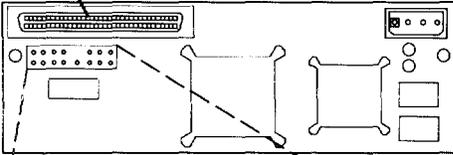
0 1 2 3

Address Jumpers
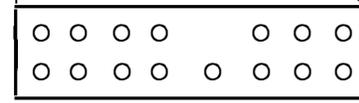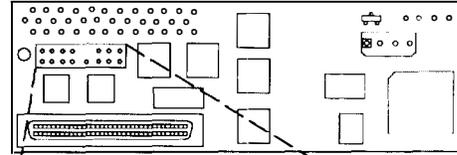
0 1 2 3

Address Jumpers

SCSI
Connector
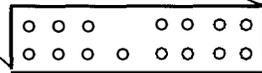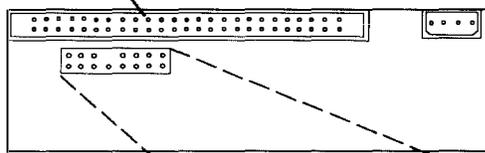
0 1 2

Address Jumpers
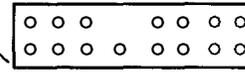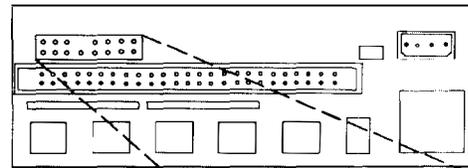
0 1 2

Address Jumpers
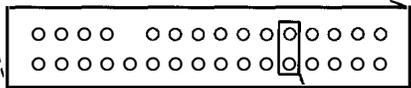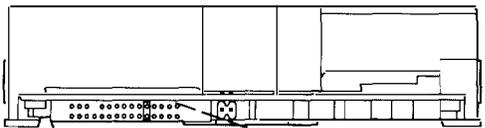
3 2 1 0

Address Jumpers
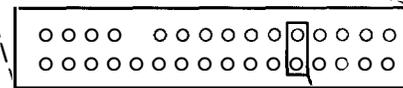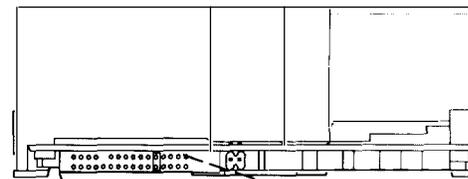
Required
Jumper

3 2 1 0

Address Jumpers

Required
Jumper

9. If you are mounting a disk drive in the upper or lower disk drive position, place the disk drive on the mounting rails.

Upper Disk Drive Position

Lower Disk Drive Position
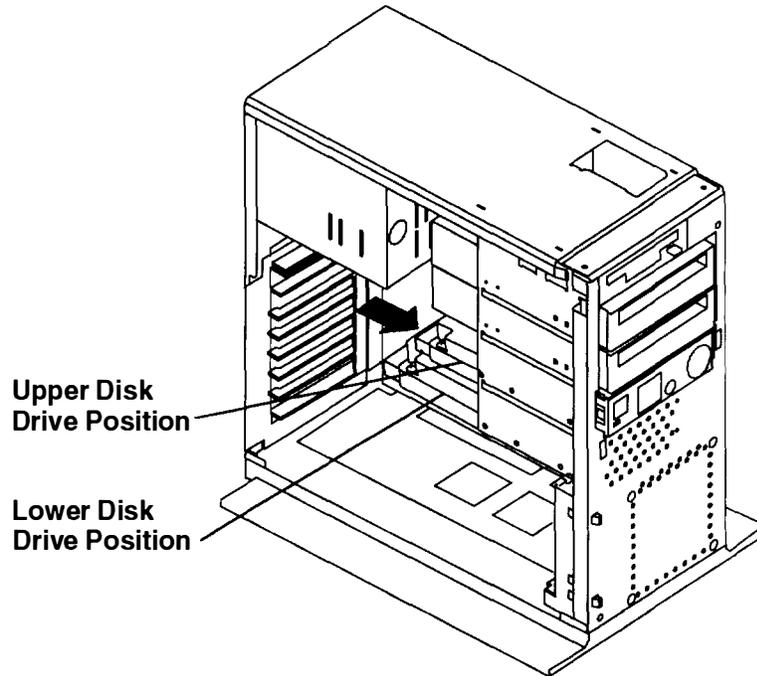
10. If you are mounting a disk drive in the upper or lower media position, then attach the mounting brackets to the disk drive as shown, and place the entire assembly in the media position within the system unit.

Mounting Brackets
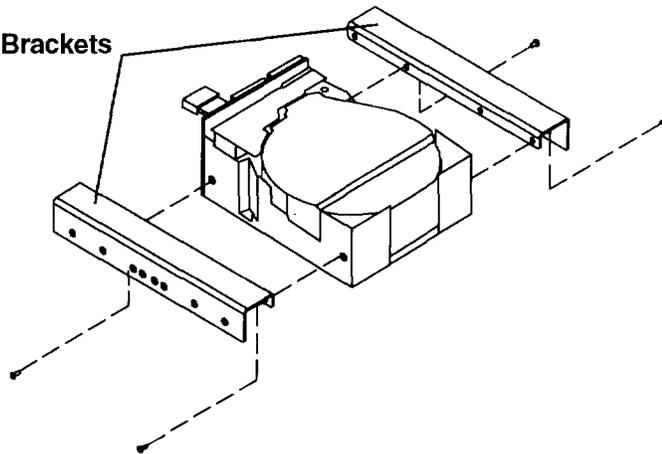
11. If the disk drive you are installing is a Fast/Wide SCSI device which you will connect to an optional Fast/Wide SCSI adapter, then connect the Fast/Wide SCSI cable to the back of the disk drive now.

Note: Do not attach the cable to the Fast/Wide SCSI adapter. You will attach the cable to the Fast/Wide SCSI adapter just before replacing the system unit cover.

Internal Fast/Wide SCSI Cable

Fast/Wide SCSI Adapter
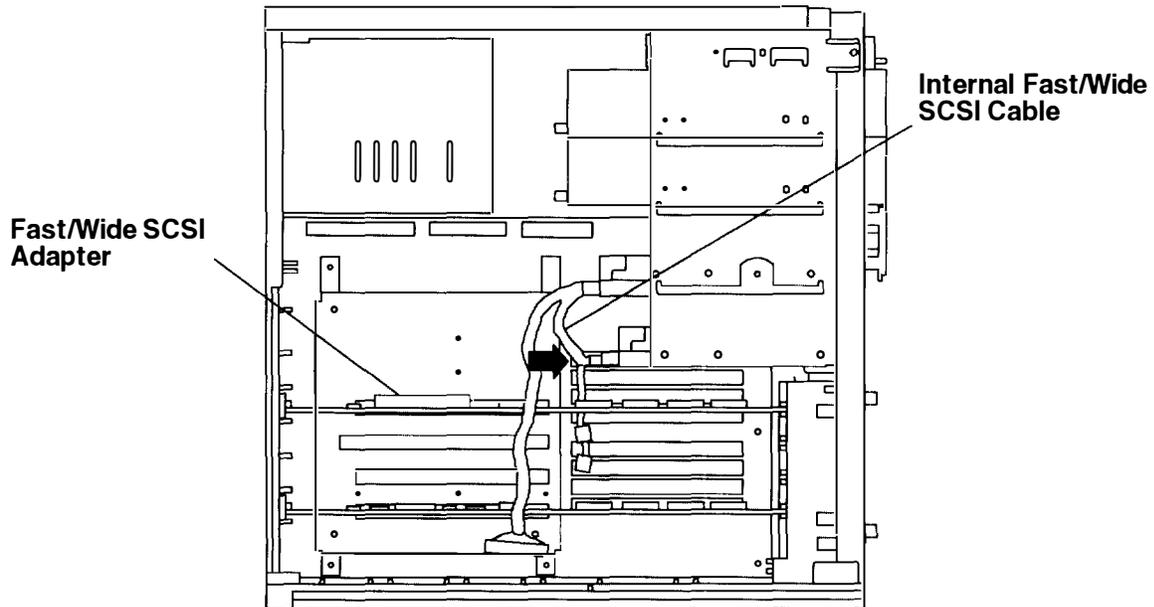
12. If you will connect the disk drive to the *built-in* SCSI adapter, then locate the connector on the internal SCSI cable that corresponds to the position in which you have installed the disk drive. Connect the internal cable to the back of the disk drive.

Internal SCSI Cable
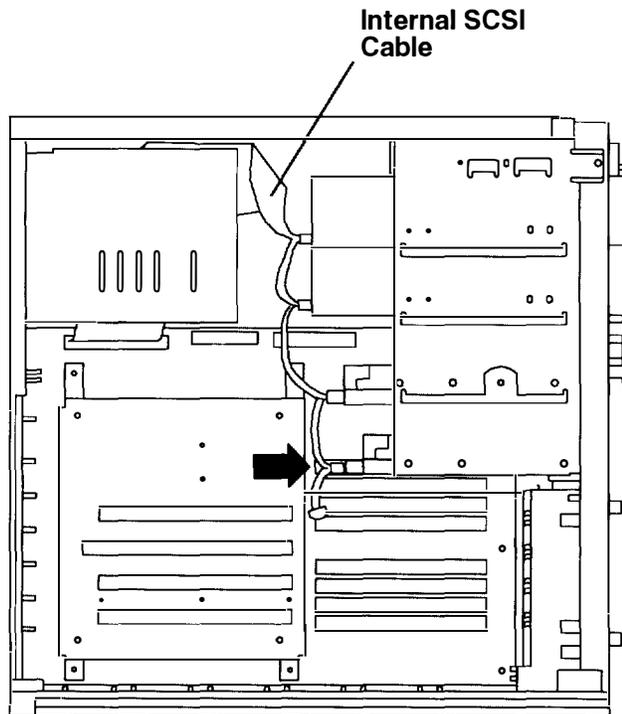
13. Locate an unused power supply cable of appropriate length and attach it to the power connector on the back of the disk drive. If no unused power supply cables are long enough to reach the new disk drive, exchange an unused power supply cable with a longer power supply cable already attached to a drive.
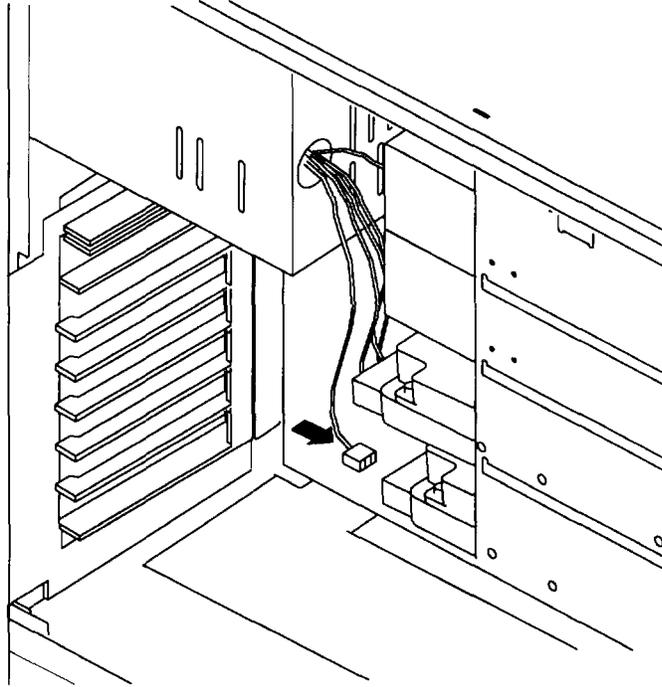
14. Slide the drive forward until the screw holes on the side of the drive line up with the holes in the side of the chassis.

15. If you are installing a disk drive in the lower disk position or the upper disk position, insert and tighten the three screws that hold the disk drive inside the system unit.

May Require Screw Starter
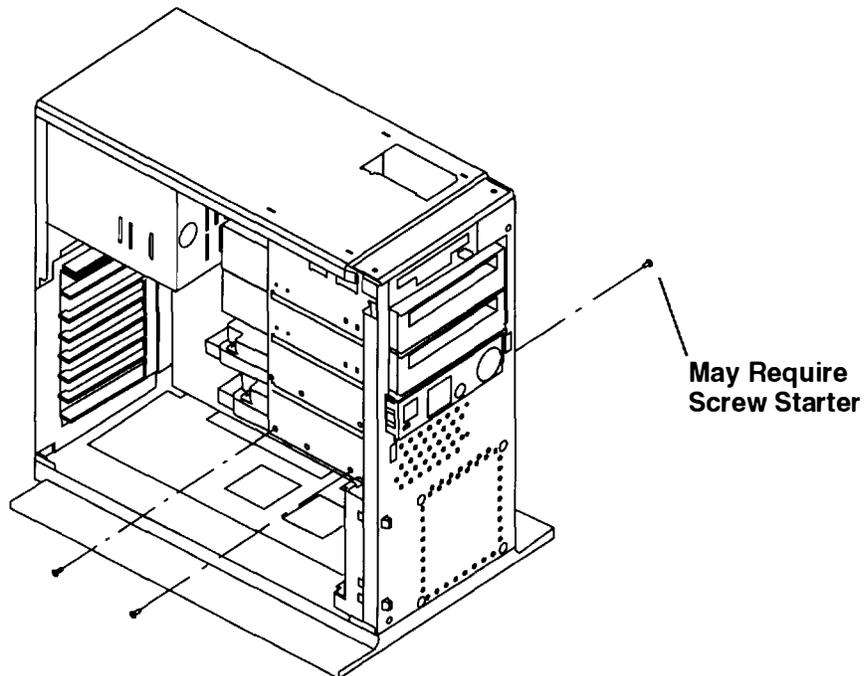
Note: The disk drive screw holes on the right side are recessed within the chassis. Move any cables aside to clear the screw hole, then insert and tighten the screw for the disk drive you are installing. You may need a screw starter to insert the screw.

Right Side of System Unit

Move Cables Aside

Upper Disk Drive Mounting Screw

Lower Disk Drive Mounting Screw
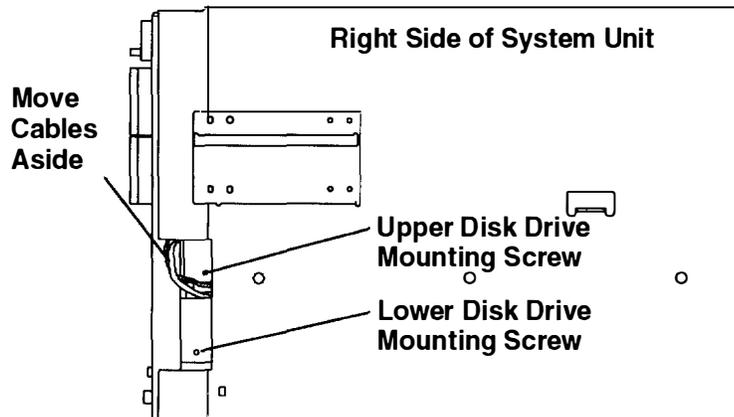
16. If you are installing a disk drive in the upper or lower media position, lift the disk drive so that a set of holes in the mounting brackets matches the mounting holes in the system unit chassis. Insert and tighten the four mounting screws as shown.
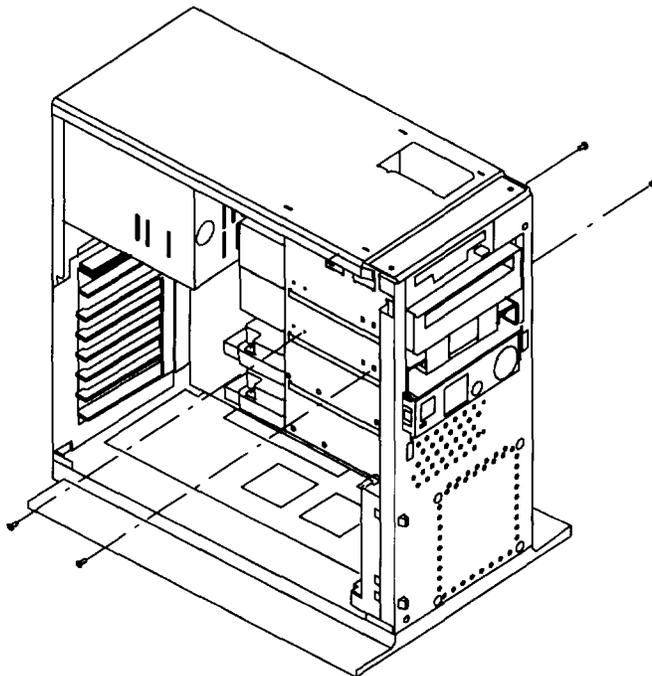
17. If no SCSI devices are connected to the external SCSI connector, then make sure the system unit SCSI terminator (Part Number 51G7737) is inserted into the system unit SCSI connector.

SCSI Connector

**System Unit
SCSI Terminator**
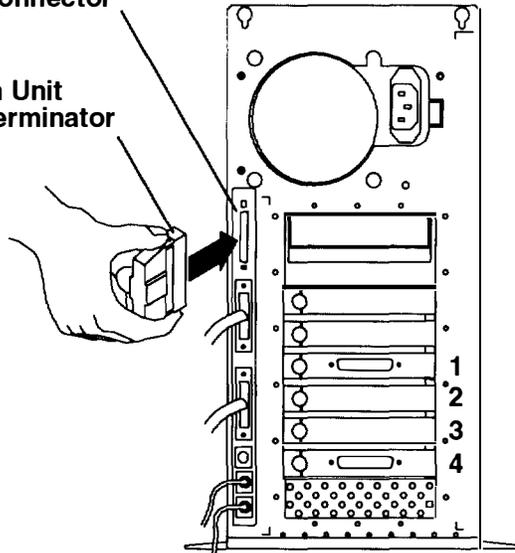
Do you have any other options to install?

NO Go to page 2-37 and replace the cover as described in "Replacing the Cover."

YES Refer to the "Option List" on page 2-7.

Installing a CPU Card

1. If you have not already done so:

   a. Read the safety notices beginning on page 2-1.

   b. Remove the cover as described in "Removing the Cover" on page 2-4.

2. If a Level-2 Cache card is installed, loosen the connector screws and remove the Level-2 Cache card.

CPU Card

Level-2 Cache Card

Connector Screws

Level-2 Cache Connector
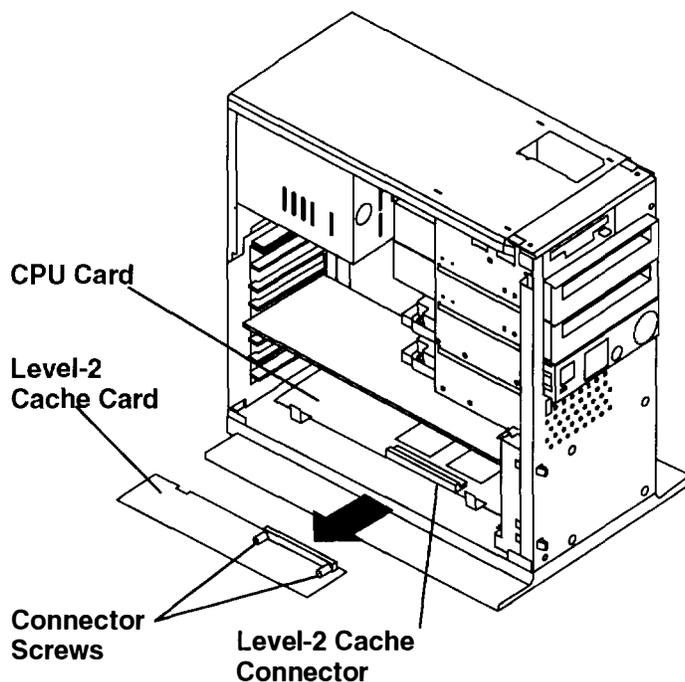
3. Remove the screw that attaches the CPU card bracket, then remove the CPU card bracket.

CPU Card

CPU Card Bracket
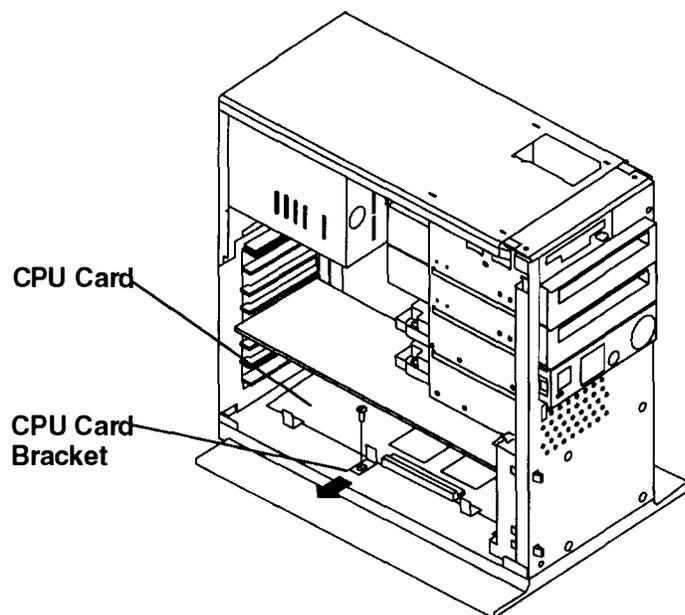
4. To remove the CPU card, pull outward on the CPU card pull tabs.

Note: Always pull only on the CPU card pull tabs.

CPU Card Pull Tabs
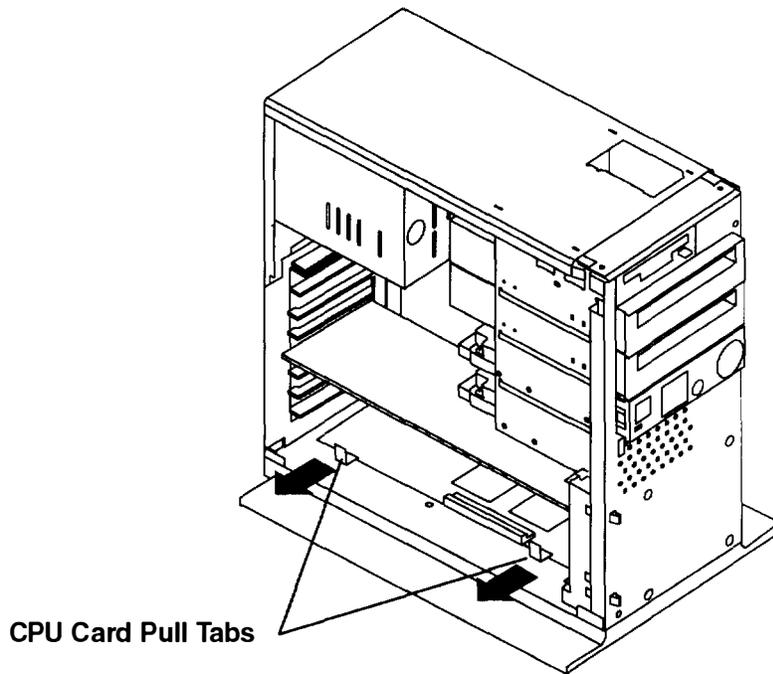
5. If the replacement CPU card does not have a battery already installed, do the following:

   a. Remove the battery from the old CPU card.

Battery

Old CPU Card
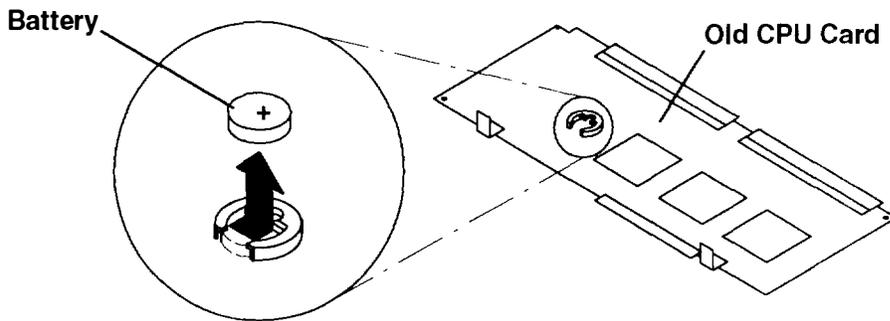
   b. Install the battery in the new CPU card. Make sure that the positive side of the battery faces upward.

New CPU Card

Battery
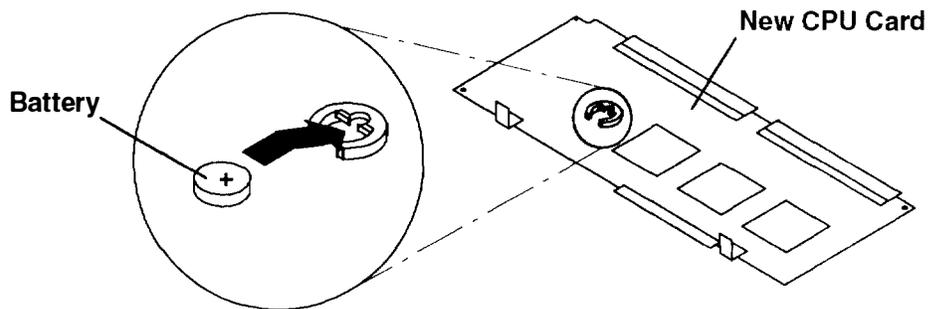
6. Gently lay the system unit down so that the open side faces upward.
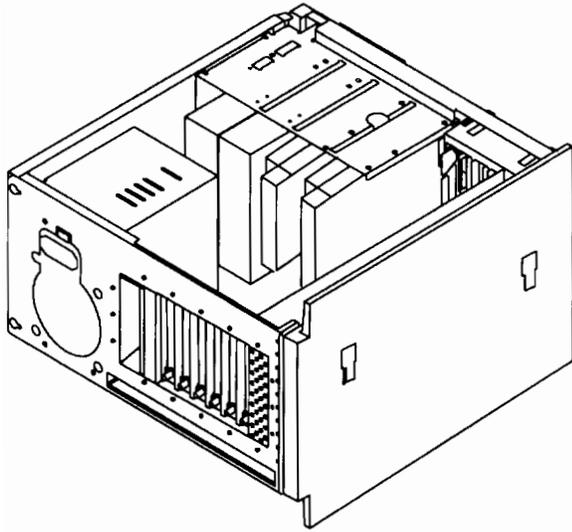
7. Place the CPU card into the rails, and insert the CPU card. You may have to apply downward pressure to firmly seat the CPU card into the system planar connectors

CPU Card

CPU Card Rails

Connectors on System Planar
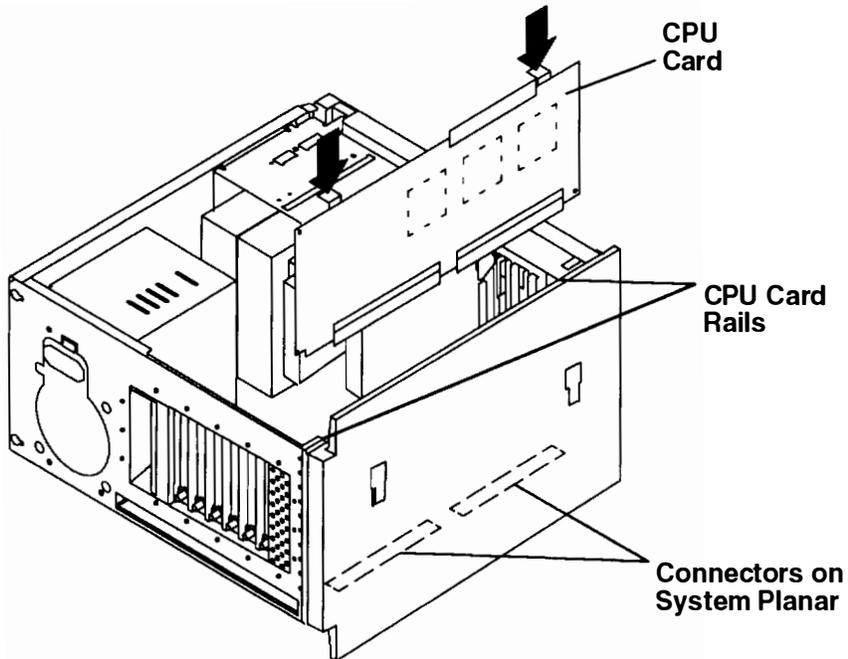
8. Replace the CPU card bracket.

CPU Card
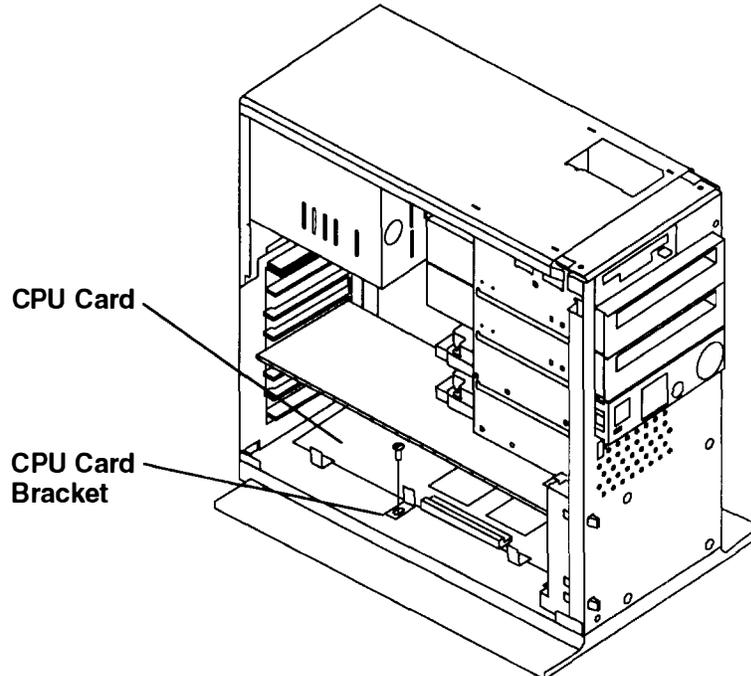
**CPU Card
Bracket**

9. See your operating system documentation for instructions on resetting the time, date authorizations, and CPU ID for your system.

   Note: The nonvolatile random access memory (NVRAM) in the new CPU card may contain system records that do not match your current system. To erase these records, you can remove the battery and briefly connect the positive and negative terminals of the battery clip with a metal screwdriver or paper clip. You can then replace the battery and continue setting up your system. The next time the system boots, the operating system will detect that the NVRAM records have been erased and construct new NVRAM records based on your current system configuration.

10. If you removed a Level-2 Cache card to install a new CPU card, see "Installing a Level-2 Cache Card" on page 2-32.

Do you have any other options to install?

NO   Go to page 2-37 and replace the cover as described in "Replacing the Cover."

YES   Refer to the "Option List" on page 2-7.

Installing a Level-2 Cache Card

To install a Level-2 Cache card:

1. If you have not already done so:

   a. Read the safety notices beginning on page 2-1.

   b. Remove the cover as described in "Removing the Cover" on page 2-4.

Note: It is not necessary to remove the airflow baffle in order to replace the Level-2 Cache card.

2. Insert the Level-2 Cache card into the connector on the CPU card.

CPU Card

Level-2 Cache Card

Connector Screws

Level-2 Cache Card Connector
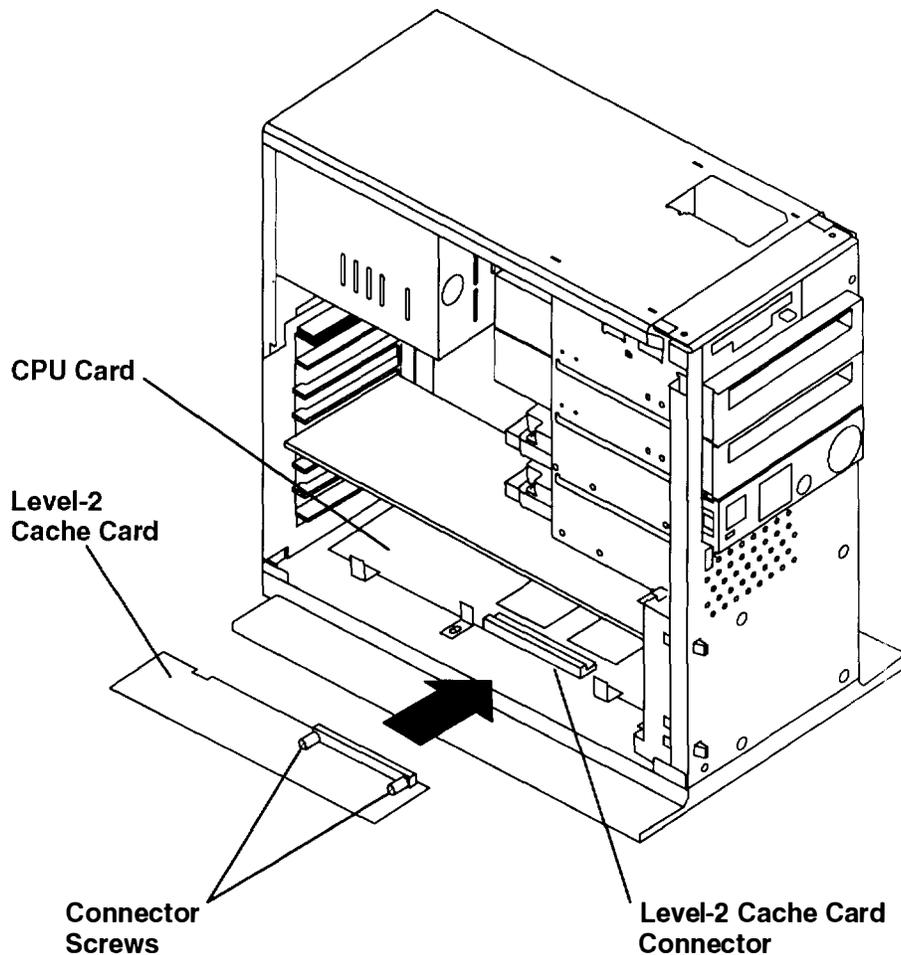
3. Tighten the connector screws on the Level-2 Cache card.

Do you have any other options to install?

NO   Go to page 2-37 and replace the cover as described in "Replacing the Cover."

YES   Refer to the "Option List" on page 2-7.

Installing an Optional Adapter

The 7009 system unit contains four slots for Micro Channel Type 3 or Type 5 adapters
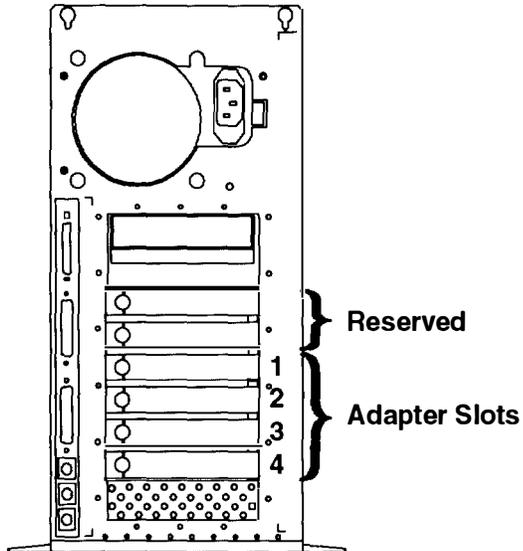
To install an adapter:

1. If you have not already done so:

    a. Read the safety notices beginning on page 2-1.

    b. Remove the cover as described in "Removing the Cover" on page 2-4.

Note: It is not necessary to remove the airflow baffle in order to install optional adapters.

2. Gently lay the system unit down so that the open side faces upward.
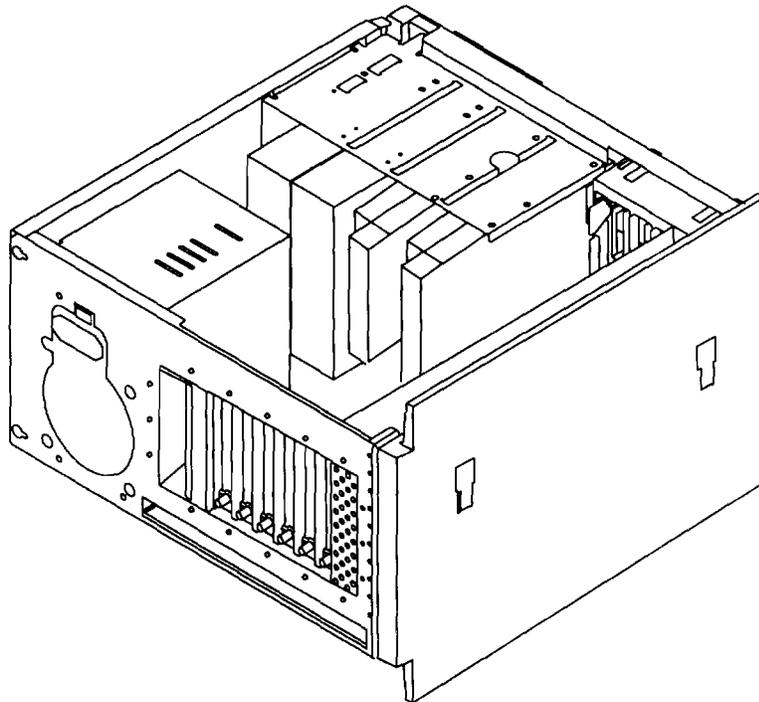
3. Loosen the serrated knob at the back of the slot in which you will install the adapter.

Note: If you are installing Fast/Wide SCSI adapters, you must install the first Fast/Wide SCSI adapter in slot 1, the second in slot 2, and so on.

**Serrated
Knobs**
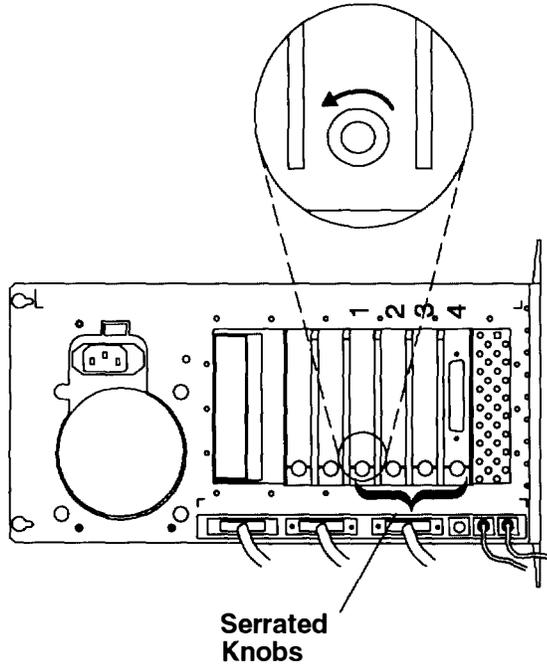
4. Remove the shield from the slot in which you will install the adapter.

Shield
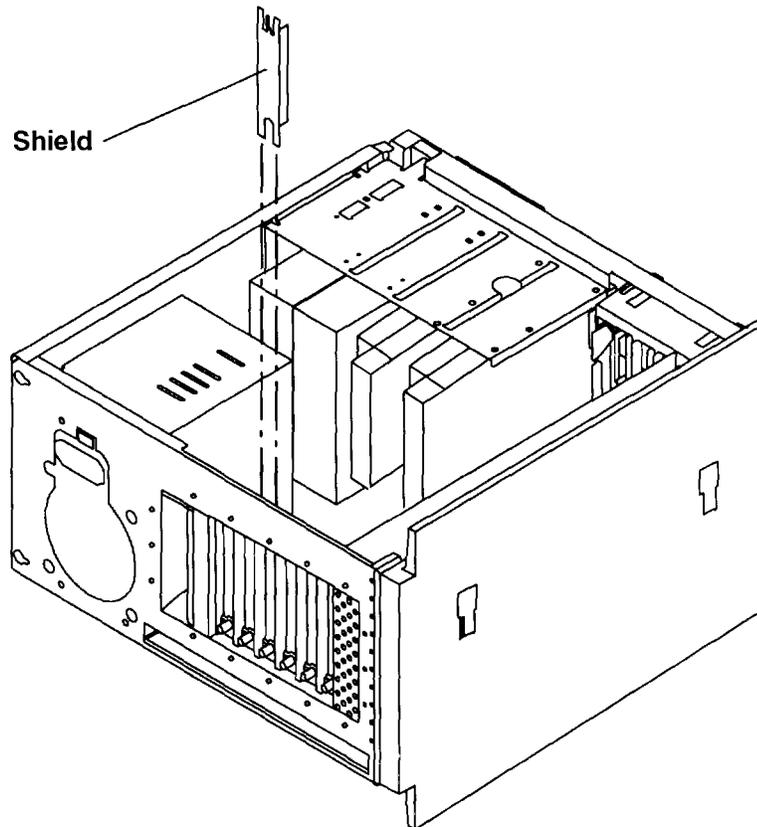
5. If you are installing a Type 5 (longer) adapter, you may need to remove the Type 3 fastener in the slot where you will install the adapter.

Type 3 Fastener
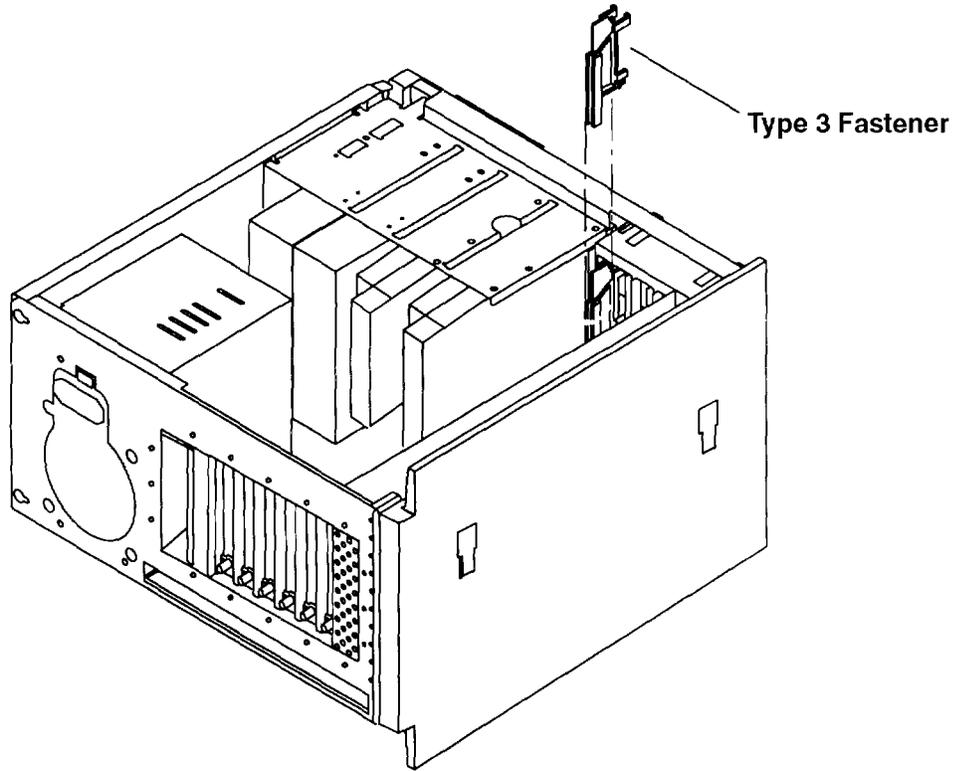
6. Insert the adapter into system unit slot. Make sure the bottom edge of the adapter is completely inserted into the connector on the system planar riser card. You may have to apply downward pressure to firmly seat the adapter in the riser card connector.
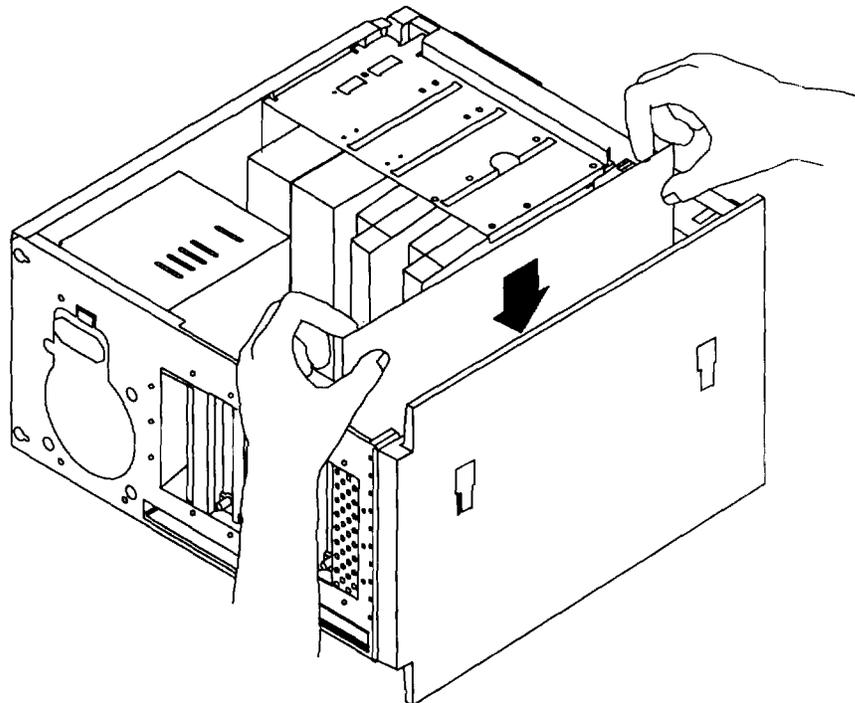
7. Tighten the serrated knob at the back of the slot.

Serrated Knob
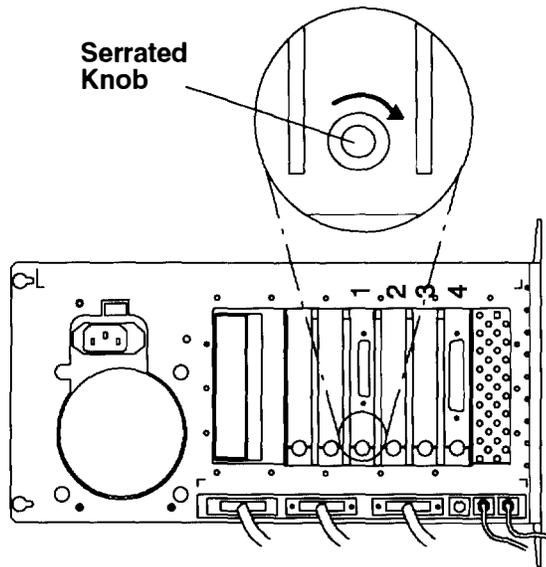
8. If you have installed a Fast/Wide SCSI adapter and will attach internal Fast/Wide SCSI devices to the adapter, connect the Fast/Wide SCSI cable to the internal devices now

   Note: Do not attach the cable to the Fast/Wide SCSI adapter now. You will attach the cable to the Fast/Wide SCSI adapter just before replacing the system unit cover.

Fast/Wide SCSI Adapter

Internal Fast/Wide SCSI Cable
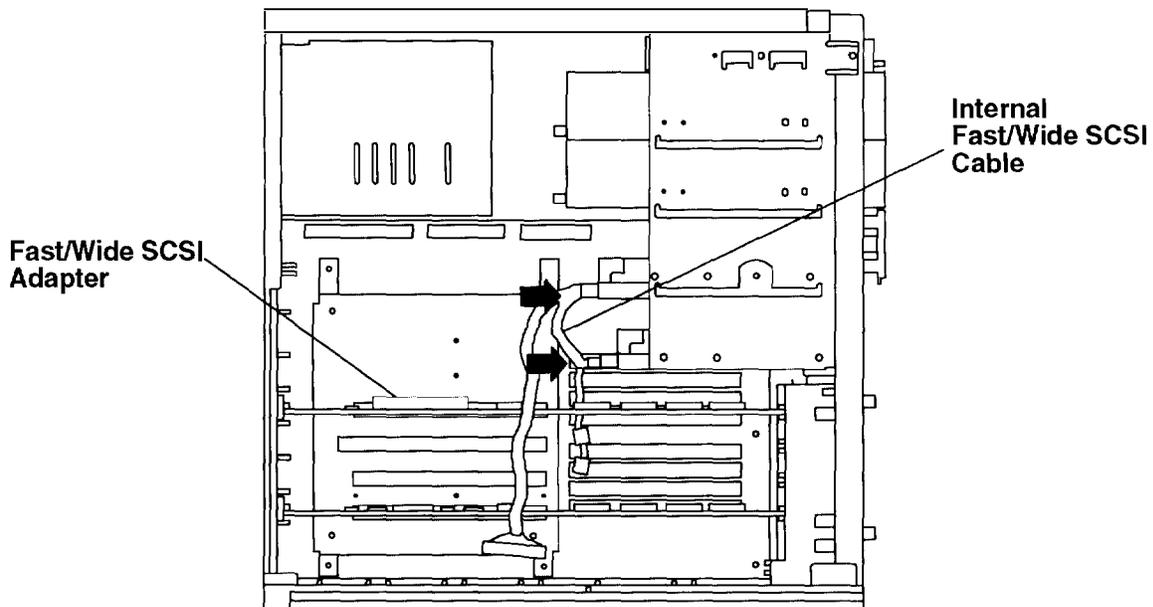
9. If you have installed an adapter other than the Fast/Wide SCSI adapter, refer to that adapter's instructions for cabling information.

Do you have any other options to install?

NO   Go to page 2-37 and replace the cover as described in "Replacing the Cover."

YES   Refer to the "Option List" on page 2-7.

Replacing the Cover

1. Install the airflow baffle into its rails. You may have to arrange the internal cables to fully insert the airflow baffle.

   Warning: The airflow baffle must be installed before replacing the cover. Failure to replace the airflow baffle could result in damage to the system unit.

   Airflow Baffle Rails
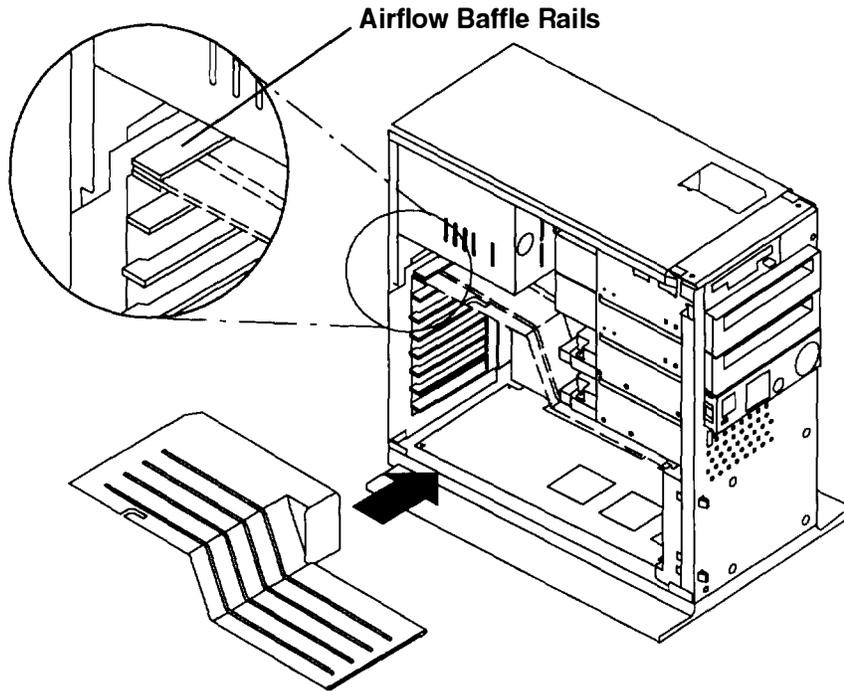
2. If your system unit contains a Fast/Wide SCSI adapter connected to internal Fast/Wide SCSI devices, insert the Fast/Wide SCSI cable into the notch in the airflow baffle and connect the Fast/Wide SCSI cable to the Fast/Wide SCSI adapter.

   Insert Fast/Wide SCSI Cable into Airflow Baffle Notch
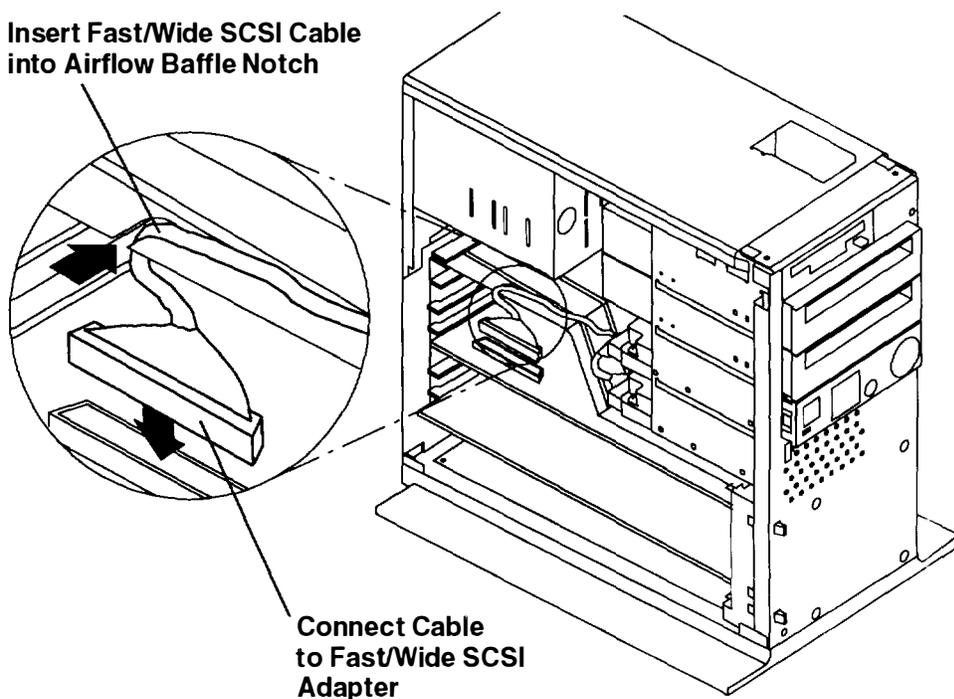
   Connect Cable to Fast/Wide SCSI Adapter

3. Slide the cover backward onto the chassis.
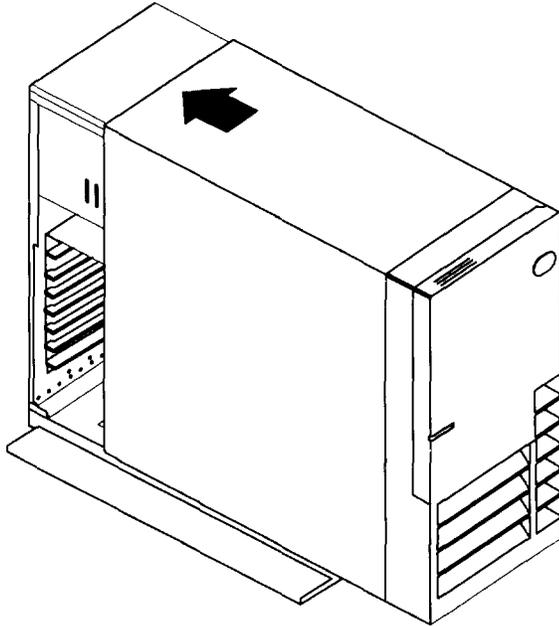
4. Open the door and insert the system unit key (if one came with your system) into the key mode switch. If the cover is fully installed, you should be able to lock the cover onto the chassis by turning the key mode switch to the Secure or OK/Normal position.
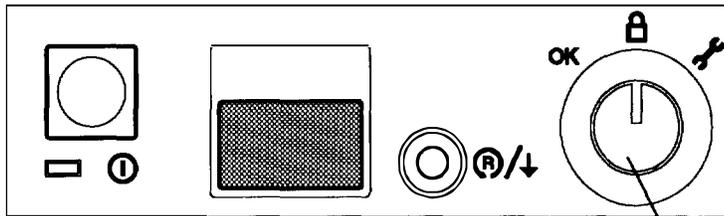
**Key Mode Switch
(Secure Position)**

Completing the Hardware Setup

To complete the hardware setup of your system unit, go to the *7009 Compact Server Hardware Setup Procedure*, Order Number SA23-2717.

Chapter 3. Using the System Unit

Setting the Key Mode Switch

The key mode switch has three positions:

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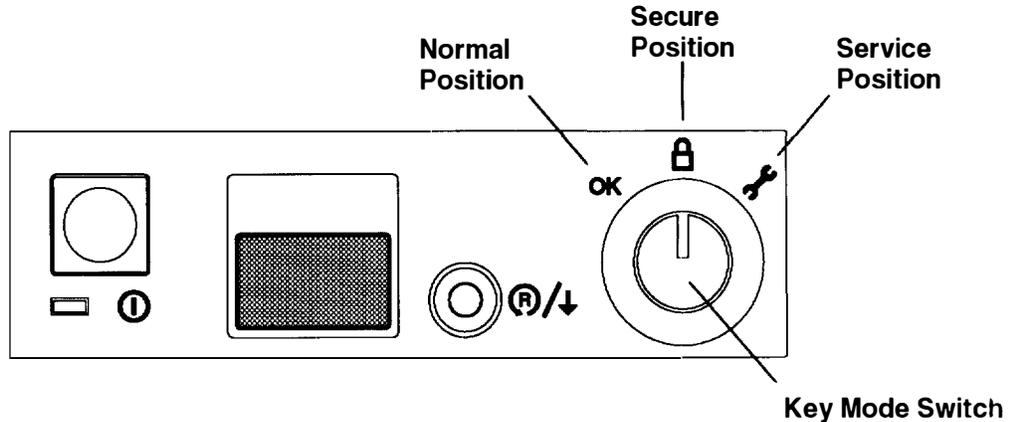
The switch is used to establish the initial program load (IPL) path. The IPL checks the system hardware, loads the system programs, and prepares the system for user operation.

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.

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 determined by the operating system.

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

  Warning: Pressing the Reset button when the key mode switch is in the Normal position can cause data to be damaged or lost if the operating system is still running. Before pressing the Reset button while the key mode switch is in the Normal position be sure to stop all running applications and shut down the operating system, if possible.

- The Secure position is used for unattended operation in an open environment. For example, the system unit could 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 from completing. 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 `200` displays in the three-digit display. 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 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 will attempt to IPL from the predetermined list of IPL devices.

  Note: If `200` displays in the three-digit display, the Main Menu can be displayed by turning the keylock to the Service position and pressing the Reset button after an IPL begins.

If there is a problem with the system unit, refer to the *AIX Version 4.1 Problem Solving Guide and Reference* or later versions before setting the key mode switch to the Service position or pressing the Reset button.

Starting the System Unit

1. Open the door.

Key Mode Switch

Power Switch

Power Indicator

Three-Digit Display

Yellow Reset Button

Door
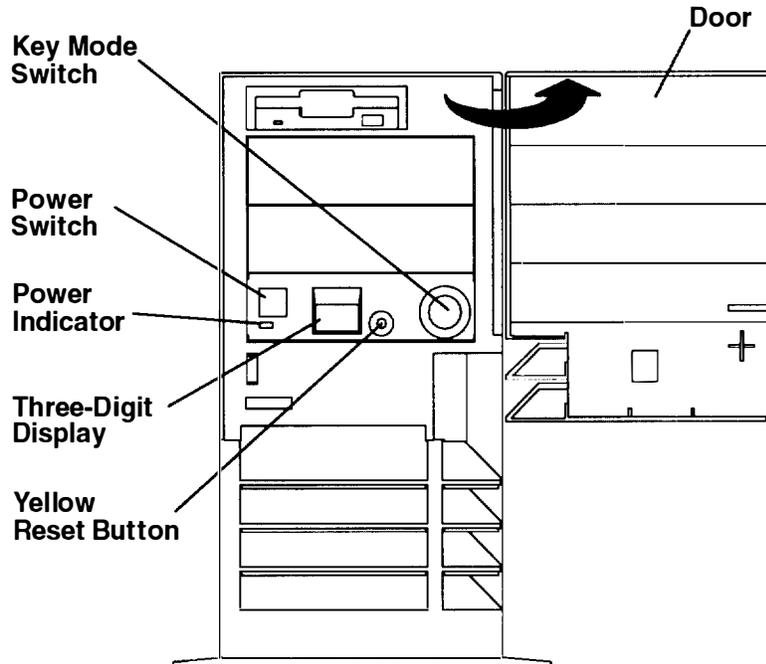
2. Set the key mode switch to the Normal position.
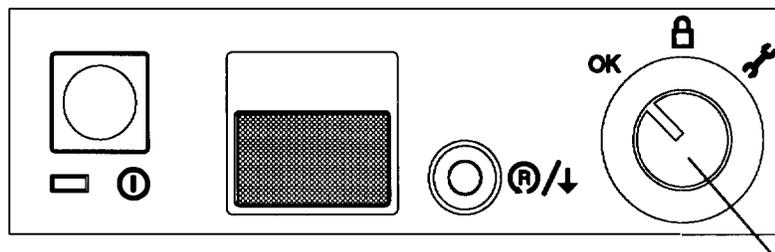
Key Mode Switch (Normal Position)

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

4. Start the system unit by pressing the power switch.

5. If power does not come on when you press the power switch, 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, go to the *AIX Version 4.1 Problem Solving Guide and Reference* or later versions.

When you press the power switch, the power indicator lights and the system starts a power-on self test (POST). During POST, numbers are displayed in the three-digit display.

Stopping the System Unit

Warning: 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** command 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. Set the system unit power switch to the Off position. (The switch is on when depressed and off when even with the front cover.)

Reading the Three-Digit Display

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 progress indicators when the key mode switch is in the Service position.

During power-on self-test (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 example, if the number for the error were 888, the display would appear as shown in the illustration.

Three-Digit Display
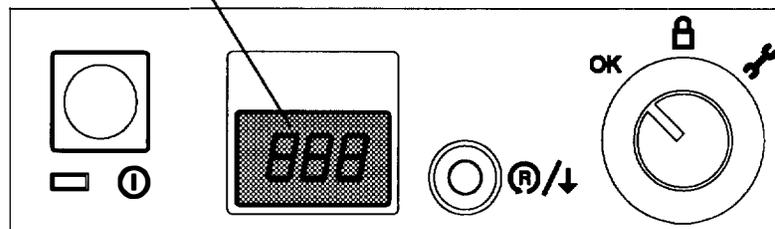
Using the Reset Button
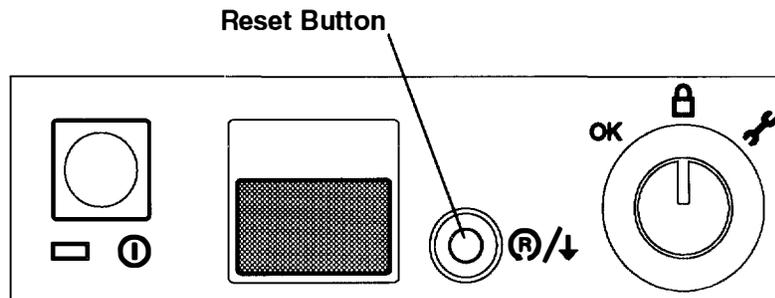
Reset Button

Warning: When the key mode switch is in the Normal or Service position, pressing the Reset button causes the unit to reset and do an IPL (initial program load). Pressing the Reset button while the operating system is running can result in damaged or lost data

The Reset button has three 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 display the Main Menu as described in Step 3 on page 1-3.

Disabling the Reset Button

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.

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:

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

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

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

- Numeric keypad is arranged like a calculator to help when typing numbers.

On all keyboards, you can adjust the tilt position for typing comfort. To tilt the keyboard, pull out on the keyboard legs. The legs will 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 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.
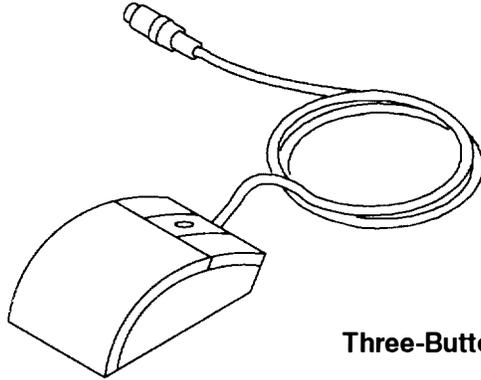
Three-Button Mouse

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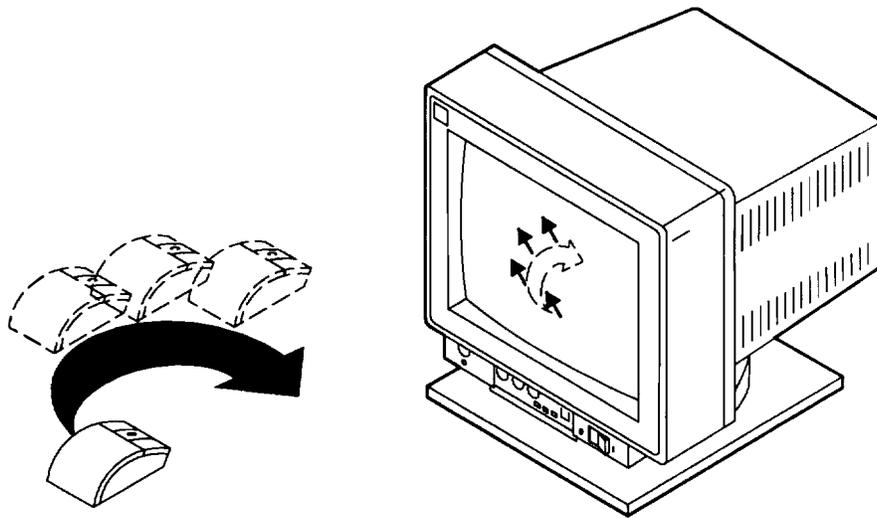
With the mouse buttons, you can perform functions such as selecting and deselecting options, extending your selection, or choosing a command. The precise function of your mouse depends on the software you are using.

The mouse has a cable that plugs into a connector at the rear of the system unit.

Handling the Mouse Correctly

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

Do not:

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

Care of the Mouse

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

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

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

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

Cleaning the Mouse

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

Open Arrows

Ball

Retaining Ring

Cavity

Open Slots
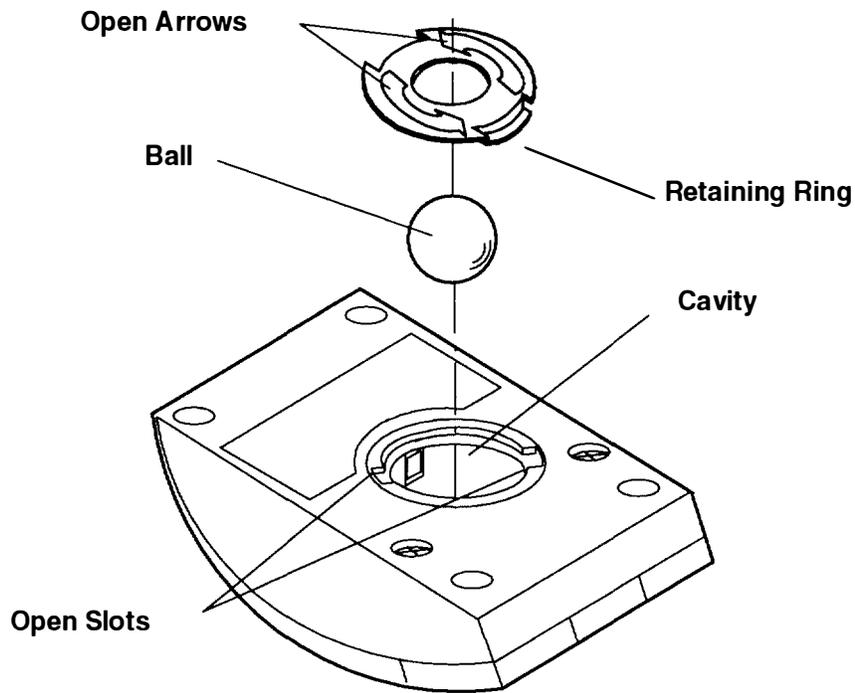
2. Remove the ball.

3. Inspect the ball for contaminants. Wipe it clean with a dry, lint-free cloth

4. If the ball is dirty, wash it in warm, soapy water. Rinse and wipe the ball with a lint-free cloth until dry.

5. Inspect the ball cavity in the mouse for foreign materials. If there are any foreign materials, remove them.

6. Replace the ball.

7. Replace the retaining ring on the mouse and align it with the open slots in the ball cavity.

8. Turn the retaining ring clockwise until the open slots are covered and you hear the ring snap into place.

Using the 3.5-Inch Diskette Drive

Diskette Compatibility

The 2.88MB diskette drive can format, read, and write diskettes compatible with the following diskette drives:

1.0MB diskettes with 720KB formatted data capacity.
2.0MB diskettes with 1.44MB formatted data capacity.
4.0MB diskettes with 2.88MB formatted data capacity.

Format the diskette according to its specified capacity.

Write-Protecting 3.5-Inch Diskettes

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

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

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

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

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

Diskette Write-Protected

Rear View

(Slot Open)
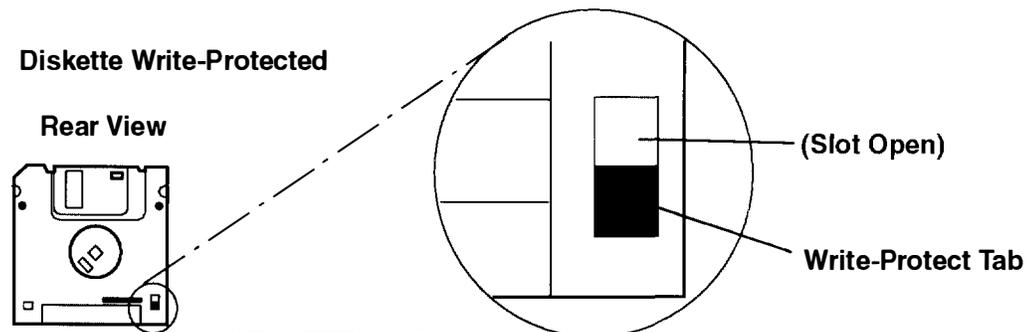
Write-Protect Tab

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

Diskette Not Write-Protected

Rear View

(Slot Closed)

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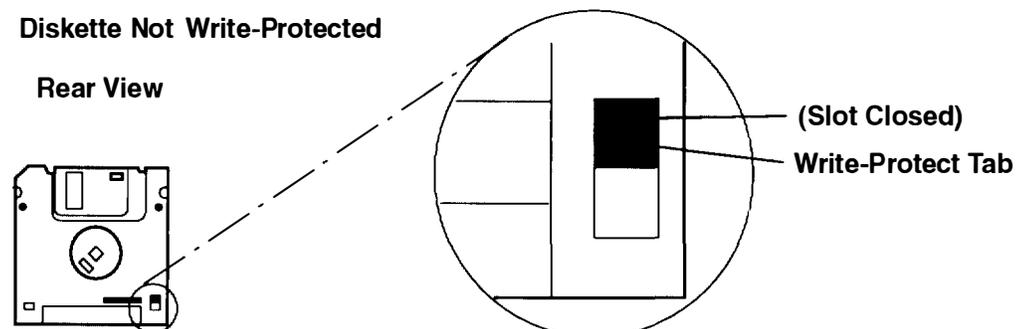
Loading and Unloading the 3.5-Inch Diskette

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
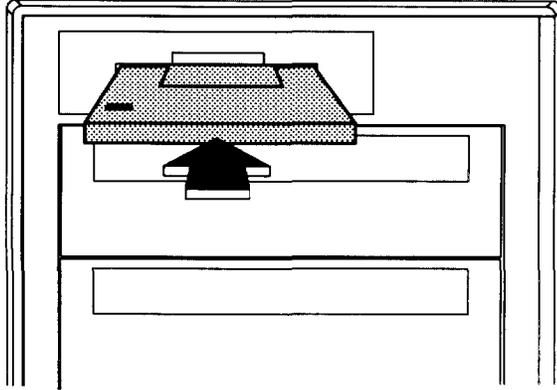
To unload the diskette, push the diskette-unload button. The diskette will unload partially from the drive. Pull the diskette out.
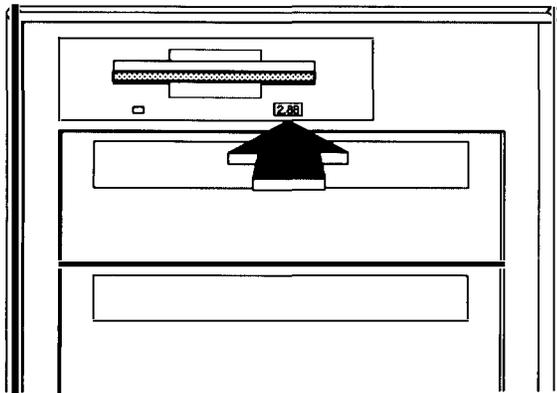
Using the CD-ROM Drive

Notes:

1. For a translation of the following notice, see *System Unit Safety Information*.

2. This caution only applies to the CD-ROM drive.

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.

If you ordered a CD-ROM drive for your Compact Server, it will look like one of the two illustrations below:

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

Type C Bezel:

Unload Button

Status Light

Disc Caddy
Opening

Unload Button

Status Light

Disc Drawer

Emergency Eject
Access

Volume Control

Headphone Jack

Volume Control

Headphone Jack
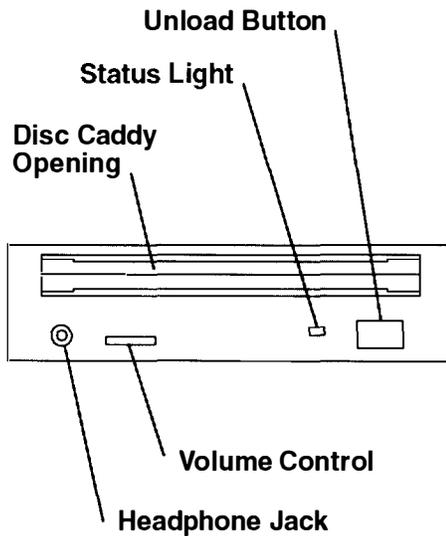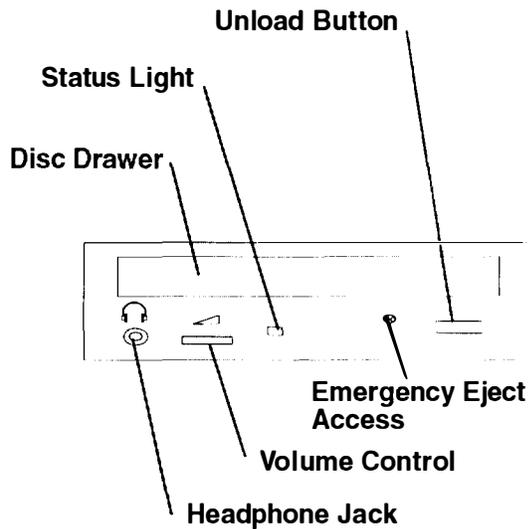
Note: White on the underside of the Unload Botton indicates CD-ROM2.

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

- Off during standby with the caddy loaded or unloaded.
- Blinks from insertion of the caddy to completion of initialization.
- Blinks slowly when either the lens or disc is dusty (lens should be cleaned by running the cleaning disc).
- Blinks quickly 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 (Type B Bezel Only)

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.
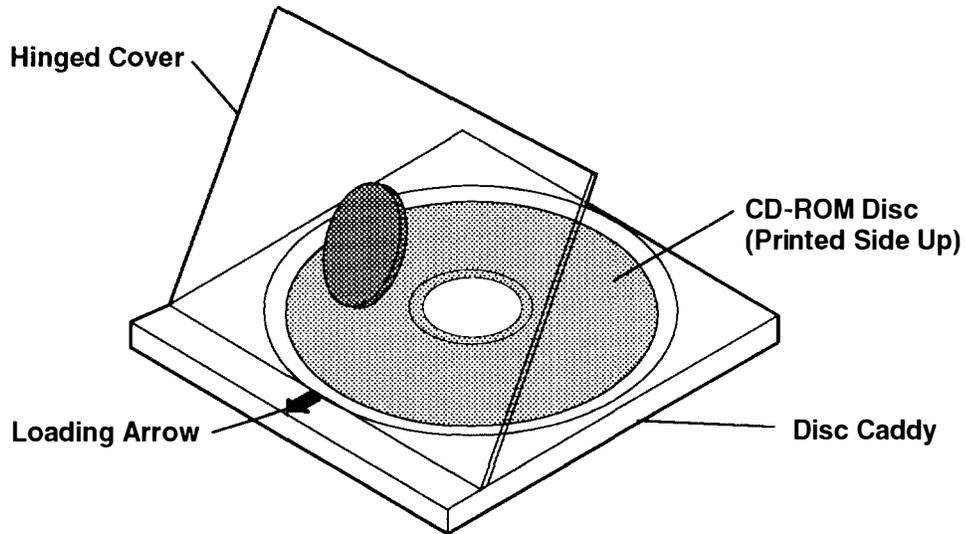
With the loading arrow toward the drive and the printed side of the disc up, insert the caddy in the disc caddy opening. Push gently on the caddy. The drive automatically pulls the caddy into the drive and prepares the disc for reading.

Type B Bezel (CD-ROM and CD-ROM2):
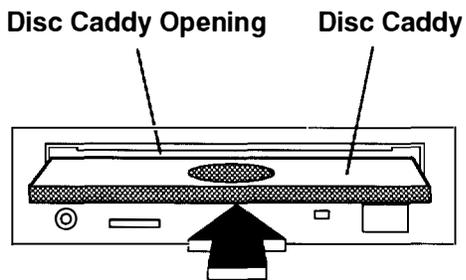
Loading the CD-ROM Drive (Type C Bezel Only)

Press the unload button to open the tray. Place the disc, with the printed side away from the tray, into the tray. Push gently on the load/unload button. The drive automatically pulls the tray into the drive and prepares the disc for reading.

Tabs
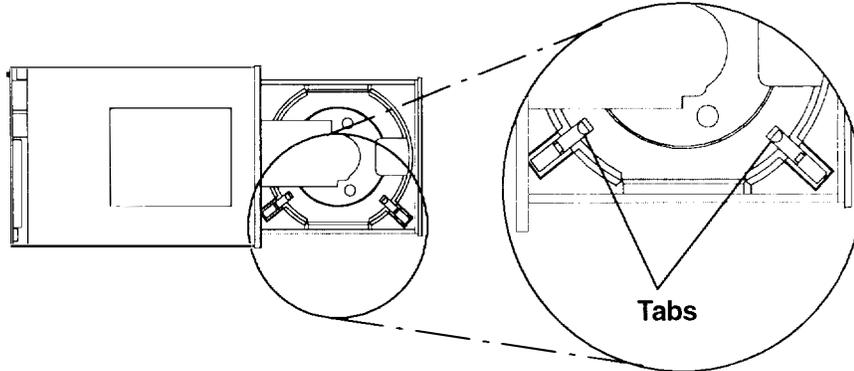
Unloading the CD-ROM Disc Caddy (Type B Bezel Only)

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.

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

Disc Caddy Opening   Disc Caddy
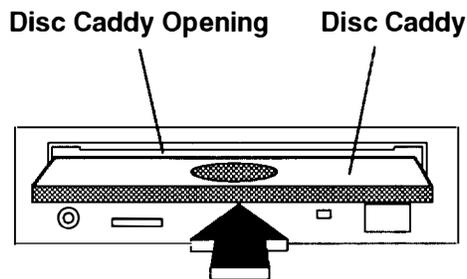
If the disc caddy cannot unload and has to be removed manually from the drive, contact your service representative.

Unloading the CD-ROM Drive (Type C Bezel Only)

Push and hold the unload button until the drawer comes out and then remove the disc.

Cleaning the CD-ROM Drive

This CD-ROM drive has an internal head-cleaning mechanism, and therefore does not require an external cleaning device. The internal cleaning mechanism cleans the head every time a caddy is inserted into the disc caddy opening.

Always handle discs carefully by the edges to avoid leaving fingerprints or scratching the disc. (This will help the disc to maintain good readability.) 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.

Emergency Eject (Type C Bezel Only)

Note: Execute the following procedure only in an emergency (caddy will not eject although pressing the unload button).

1. Power-off the CD-Rom drive.

2. Insert a small diameter rod, such as a straightened paper clip, into the emergency eject hole. (Refer to the illustration below for the location of the emergency eject hole)

3. Push the tool in until some resistance is felt.

4. Maintain a small amount of pressure on the rod while pulling on the tray with your finger nail.

5. Pull the tray open and remove the disc.

Note: Normally the tray will make a ratcheting sound when pulling it open using the above procedure.

Emergency Eject Access

Note to translators: the following tape information was not included in the previous version of this book but is identical to material in the *7012 G Series Operator Guide* (SA23-2740-01).

General Information for 2.3GB and 5.0GB 8-mm Tape Drives

Recommendations

- Use only data grade 8-mm tape cartridges. These cartridges are identified by either a Data, D, or D8 marking on the data cartridge. Use of video grade cartridges can damage the 8-mm tape drive and can void the warranty of your 8-mm tape drive.

- Remove the tape cartridge from the tape drive when it is not in use, and store the cartridge in the cartridge case.

- Do not open the door on the data tape cartridge. This door covers and protects the magnetic tape material from dirt, dust, and damage.

- Avoid touching the tape because this can cause loss of data.

- Keep the tape drive door closed on the 2.3GB 8-mm tape drive except when loading or unloading a tape cartridge.

- Back up and then discard any tape cartridge that repeatedly produces error messages The error information is in the system error log.

- Clean the tape path regularly according to the cleaning procedure of the 8-mm tape drive. Use only recommended cleaning cartridges; other cleaning cartridges can permanently damage your 8-mm tape drive.

Warning: Do not use video grade cartridges in the 8-mm tape drive. Video grade tapes may be unreliable and may cause permanent damage to the 8-mm tape drive.

Types of 8-mm Tape Cartridges

Refer to Appendix A for tape cartridge part numbers.

- *Test Tape Cartridge:* This is a specially labeled tape cartridge that is in the media kit with the 8-mm tape drive. Use this cartridge only when checking the operation of the drive or running diagnostics; do not use it to save programs or data.

- *Data Tape Cartridge:* This is a unlabeled blank tape cartridge that is in the media kit. Use this cartridge for saving your programs or data. The same data tape cartridge can be used in either a 2.3GB 8-mm tape drive or a 5.0GB 8-mm tape drive.

- *Cleaning Tape Cartridge:* Use this cartridge for cleaning the 8-mm tape path. For more information, see "Cleaning the Tape Path on the 5.0GB 8-mm Tape Drive" on page 3-21.

Tape Cartridge Compatibility

The 8-mm tape drive is compatible with existing 8-mm tape subsystems that comply to the American National Standard (ANSI) X3B5/89-136, Helical-scan Digital Computer Tape Cartridge, 8-mm for Information Exchange. Data compression effectively increases the cartridge capacity and data transfer rate for the 5.0GB tape cartridges.

8-mm Tape Drive	Format Modes (C = compression mode)			
	2.3GB	**2.3GB (C)**	**5.0GB**	**5.0GB (C)**
2.3B	Read/Write			
5.0GB	Read/Write	Read only	Read/Write	Read/Write

Environment Considerations for 8-mm Data Cartridges

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

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

Before using a cartridge, always let it adjust (acclimate) to the operating environment. Do this by placing the cartridge with its container in the operating environment for as long as it has been away from this environment or for 24 hours, whichever is less.

Acclimation is necessary for any data cartridge that has been exposed to a different humidity environment or a temperature change of 11°C or 20°F or more.

	Operating Ranges	Storage	Shipping
Temperature	16°C to 32°C (60°F to 90°F)	5°C to 32°C (40°F to 90°F)	−40°C to 52°C (−40°F to 125°F)
Relative Humidity (noncondensing)	20 to 80%	20 to 80%	20 to 80%
Maximum Wet Bulb	26°C (79°F)	26°C (79°F)	26° C (79°F)

Operating in Harsh Environments

The 8-mm tape drive is ideally suited to streaming operations, as opposed to tape movement operations involving multiple stop/starts and random searches. When the tape is used for frequent stop and start operations, streaming movement is beneficial and should be used whenever possible. This can be accomplished by ensuring that any save or restore operation is the only active operation performed by a device connected to this SCSI I/O controller.

Any tape that has been used outside the ranges specified in the table on page 3-17 for an extended period of time (50 passes in 40 hours of nonstop operation) should not be used as an archival tape. Exposure to the environment will deteriorate the magnetic and physical strength of the tape. Do not store important data on a tape that has been used outside the specified ranges; transfer the data to a new tape for reliable archiving.

8-mm Data Cartridge Erasure

Most bulk eraser devices do not have the capability to erase 8-mm data cartridges. To properly erase an 8-mm data cartridge with a bulk eraser device, the erasure rating must be at least 1500 oersted.

The 2.3GB and the 5.0GB 8-mm tape drives erase residual data before writing new data on the data tape.

Tape Cartridge Data Efficiency

The 8-mm tape cartridge efficiency is defined as the amount of data that can be stored on the cartridge. The following variables affect the amount of data that can be stored on a tape cartridge:

- Size of the data file
- Number of file marks per file
- File mark size used
- Compatibility mode (2.3GB or 5.0GB)
- Media rewrites.

The effects of some of these variables are listed in the charts on the following page.

Using the 8-mm Tape Drive

The 5.0GB 8-mm tape drive has two green status lights and one amber status light. The on/off combinations of the status light indicate the conditions of the 8-mm tape drive.

Internal magnetic tape drives are typically used as backup drives.

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

Disturbance (amber status light)

Ready (green status light)

Busy (green status light)

8-mm Tape Drive Operator controls
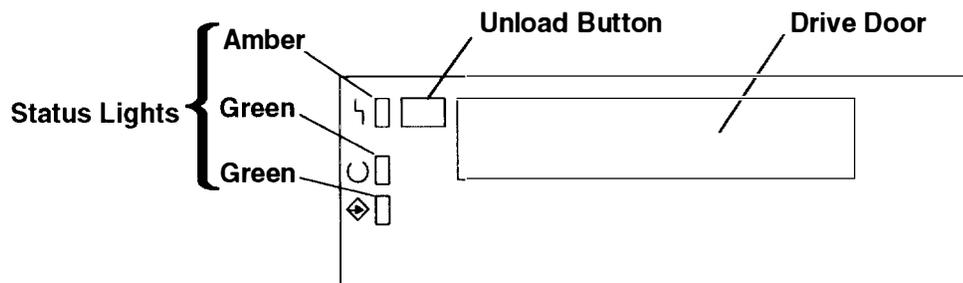
Status Lights

The following table explains the meaning of the green and amber status lights.

Disturbance	Ready	Busy	What has occurred:
On	On	On	The power-on self test (POST) is running or the system has issued a Reset to the drive.
Off	Off	Off	One of the following has occurred: • The power is off. • The POST has completed successfully, but no tape cartridge has been inserted.
Off	Off	Flashing	A tape cartridge has been inserted and the 8-mm tape drive is performing a tape load/unload operation.
Off	On	Off	A tape cartridge has been inserted and the 8-mm tape drive is ready to receive commands
Off	On	Flashing	The tape is in motion and the 8-mm tape drive is busy running a device operation
Flashing	Off	Off	The 8-mm tape drive has detected an internal fault that requires corrective action.
On	Off or On	Off or Flashing	The tape path requires cleaning.

Note: If a fault or an error condition occurs, first try to recover by pressing the unload button. If the condition continues, call your service representative.

Write-Protecting 8-mm Tape Cartridges

Setting the write-protect tab on a tape cartridge is necessary so that information is not accidentally lost.

When the write-protect tab of a tape cartridge is set (window closed), information can be read from the tape, but cannot be written to it.

The window on the tape cartridge controls write-protection as follows:

Write-Protect Tab Set **Write-Protect Tab Not Set**

Window Closed

Window Opened
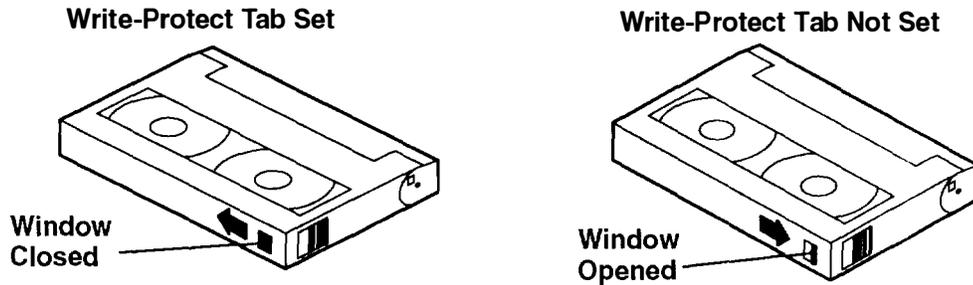
Loading and Unloading the 8-mm Tape Cartridge

To load an 8-mm tape cartridge, grasp the edges of the 8-mm tape cartridge with the write–protect switch toward you and the window side of the cartridge toward your left

Slide the tape cartridge into the opening on the front of the 8-mm tape drive until the loading mechanism pulls the cartridge into the drive and the drive door closes. The ready status light (green) will come on if the load operation was successful.
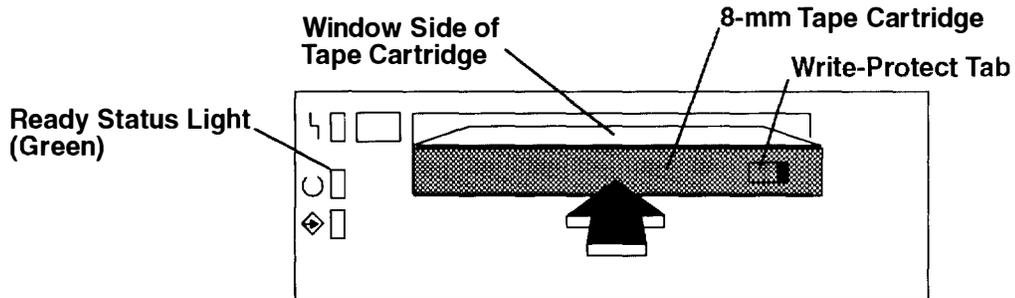
When the green light comes on, the drive is ready for data operation.

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

To unload the 8-mm tape cartridge, push the unload button. The drive rewinds the tape within the cartridge and ejects the cartridge from the drive opening.
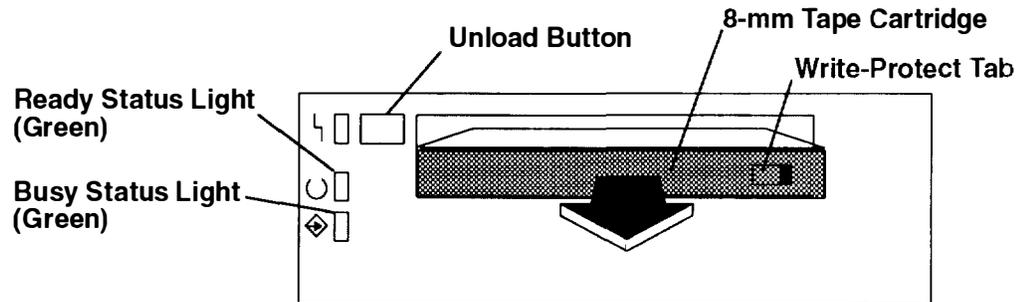
If the tape cartridge cannot unload and has to be removed manually from the drive, contact your service representative.

Cleaning the Tape Path on the 5.0GB 8-mm Tape Drive

Warning: Do not use video cleaning cartridges in the 8-mm tape drive. Video cleaning cartridges can damage the 8-mm tape drive.

The 8-mm tape path should be cleaned either approximately every 30 hours of tape motion or once a month, whichever occurs first. The 5.0GB 8-mm tape drive counts the number of hours of tape motion and indicates when the tape path requires cleaning when the lighted disturbance status light (amber) is on.

More frequent cleaning may be required if the drive is operated in a dusty environment or in humid conditions. If the dust is allowed to accumulate, the drive has to perform more reads and writes. This can cause data loss, and may be prevented by regularly scheduled cleaning of the drive.

The cleaning cartridge cleans the 8-mm tape drive 12 times before it needs to be discarded. If you attempt to use an 8-mm cleaning cartridge more than 12 times, the tape drive automatically detects the error and ejects the cleaning cartridge with the disturbance status light (amber) remaining on.

Some video cleaning cartridges are extremely abrasive. An 8-mm tape drive may be permanently damaged after only a few cleaning operations using an abrasive-type cleaning cartridge.

Before loading the cleaning cartridge, make sure the power to the 8-mm tape drive is on

To load the 8-mm cleaning cartridge, do the following:

1. Grasp the edges of the 8-mm cleaning cartridge with the window side of the cartridge facing up.

2. Slide the cleaning cartridge into the opening on the front of the 8-mm tape drive until the loading mechanism pulls the cartridge into the drive.

**Window Side of
Cleaning Cartridge**   **8-mm Cleaning Cartridge**

**Disturbance Status Light
(Amber)**
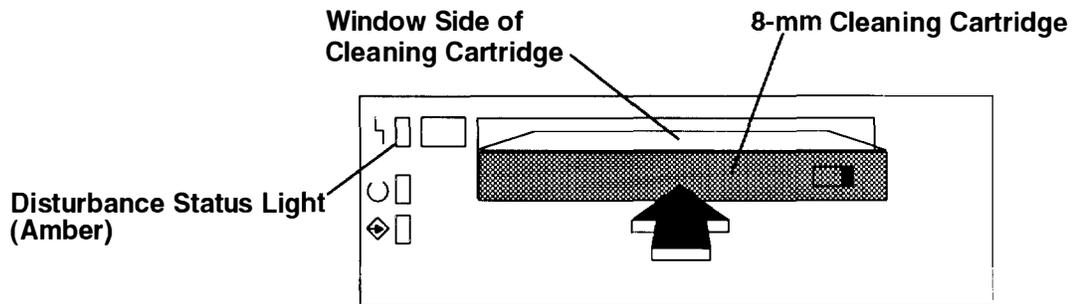
After the 8-mm cleaning cartridge has been fully inserted into the 8-mm tape drive. the
following cleaning operations are performed automatically:

1. The cleaning tape is loaded into the tape path.

2. The drive is cleaned by moving the cleaning tape forward for approximately two minutes.

3. The tape is unloaded and the cleaning cartridge is ejected from the tape drive when the
   cleaning operation is complete.

4. A successful cleaning operation is indicated when the disturbance status light (amber)
   goes off.

General Information for 4.0GB 4-mm Tape Drive

The 4.0GB 4-mm tape drive is an internal streaming tape drive that is used to:

- Save and restore system data files.

- Archive important records.

- Distribute operating system software upgrades.

The 4-mm tape drive is designed to be attached to any system using a single-ended interface meeting the Small Computer System Interface II (SCSI-II) Standard ANSI X3.131-199X Rev. 10h.

The 4-mm tape drive has the following features:

- Capacity of 4.0 GB per cartridge. 8 GB is typical with data compression and with DDS2 data cartridges.

  The actual capacity per cartridge varies depending on the application and the type of data cartridge being used.

- Data transfer rate is 400 KBps. 800 KBps is typical with data compression.

  Note: Data compression activated is the default setting from the factory. Data compression is usually controlled by the application software.

- Read and write of DDS|||| tape cartridges in 2.0 GB per cartridge format.

- A status light that indicates when it is time to clean the tape path.

- Internal diagnostics that are activated when the 4-mm Diagnostic Cartridge is inserted and loaded into the drive.

- Media recognition system: only *data grade* media can be used with this tape drive.

The 4-mm tape drive uses a 4-mm data cartridge for saving and restoring your system data. The 4-mm tape drive is designed to use only 4-mm Digital Data Storage (DDS) cartridges. These cartridges are identified by the DDS symbols (shown below) somewhere on the data cartridge.

Recommendations

Warning: Tape cartridges that do not carry the proper DDS symbol cannot be written to and their use will cause the 4-mm tape drive to report an error.

* Use only 4-mm Digital Data Storage (DDS) cartridges.

Warning: Use of other than recommended cleaning cartridges can damage your tape drive and will void the drive warranty.

* Clean the tape path by using the recommended cleaning cartridge. Follow the instructions on the cartridge.
* Back up and then discard any tape cartridge that repeatedly produces error messages The error information is in the system error log.
* Do *not* open the door on the data cartridge that covers the tape. This door protects the magnetic tape material from dirt, dust, and damage.
* Do *not* operate in a dusty environment.
* Do *not* touch the tape material. Any substance transferred to the tape by touching it could cause loss of data.

Types of 4-mm Tape Cartridges

The 4-mm tape drive is shipped with three 4-mm cartridges to help start your tape operations immediately. Refer to Appendix A for tape cartridge part numbers

4-mm Data Cartridge:	Use this non-labeled cartridge for saving or restoring your programs or data. Additional data cartridges can be ordered
4-mm Diagnostic Cartridge:	Use this specially labeled cartridge to perform diagnostics on the drive. Do *not* use it to save or restore programs or data.
Cleaning Cartridge:	Use this cartridge for cleaning the 4-mm tape path. For more information, see "Cleaning the Tape Path on the 4.0GB 4-mm Tape Drive" on page 3-31.

Tape Cartridge Compatibility

The 4-mm Tape Drive is compatible with existing 4-mm tape subsystems that are designed to operate with Digital Data Storage approved media, which meet the following standards:

- For DDS||||

  - American National Standard (ANSI) standard, X3.203-191, *Helical-scan Digital Computer Tape Cartridge, 3.81mm.*

  - European Computer Manufacturers Association (EMCA) standard, EMCA-150, *3.81mm Wide Magnetic Tape Cartridge and* DDS|||| *format.*

- For DDS2

  - European Computer Manufacturers Association (EMCA) standard, EMCA/TC17/93/20, *3.81mm Wide Magnetic Tape Cartridge for Information Interchange Helical Scan Recording,* DDS2 *format.*

You cannot change the density setting of the drive, as the device reconfigures itself automatically, depending on the media type installed, as follows:

Media Type	Device Configuration
DDS	Read-only
DDS||||	Read/write in 2.0GB mode only.
DDS2	Read in either density; write in 4.0GB mode only.
Non-DDS	Not supported. The cartridge will eject.

Setting the Write-Protect Tab on 4-mm Tape Cartridges

The window on the tape cartridge controls write-protection. When the write-protect tab of a tape cartridge is set (window open), information can be read from the tape, but cannot be written to it. When the write-protect tab of a tape cartridge is not set (window closed), information can be both written to and read from the tape. Trying to write to a 4-mm data cartridge with the window open causes an error.

Write-Protect Tab Not Set   **Write-Protect Tab Set**

Window Closed   **Window Opened**
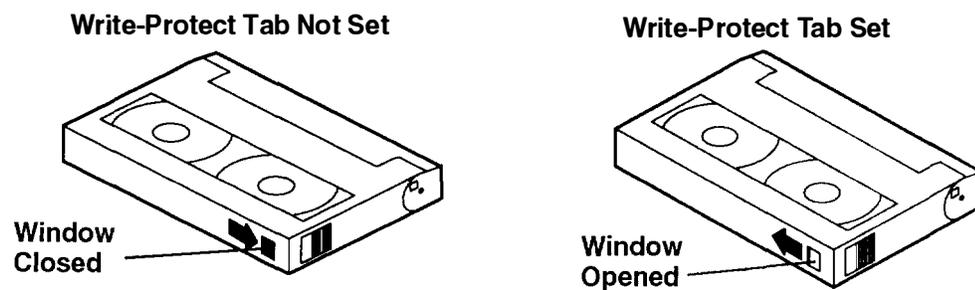
Environmental Considerations for 4-mm Data Cartridges

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

Warning: The manufacturer has specified a set of temperature and humidity ranges in which the 4-mm data cartridge can operate with ease. Only regular cleaning procedures, as described in "Cleaning the Tape Path on the 4.0GB 4-mm Tape Drive" on page 3-31, are required when operating the cartridge within this range. The risk of possible data loss is increased if 4-mm tape cartridges are operated, stored, or shipped outside the temperature or humidity ranges shown in the following table.

Before using a cartridge, always let it adjust (acclimate) to the operating environment. Do this by placing the cartridge with its container in the operating environment for as long as it has been away from this environment or for 24 hours, whichever is less.

Acclimation is necessary for any data cartridge that has been exposed to a different humidity environment or a temperature change of 11°C or 20°F or more.

	Operating Ranges	Storage	Shipping
Temperature	16°C to 32°C (60°F to 90°F)	5°C to 32°C (40°F to 90°F)	−40°C to 52°C (−40°F to 125°F)
Relative Humidity (non-condensing)	20 to 80%	20 to 80%	5 to 80%
Maximum Wet Bulb	26°C (79°F)	26°C (79°F)	26° C (79°F)

Operating in Harsh Environments

The 4-mm tape drive is ideally suited to streaming operations, as opposed to tape movement operations involving multiple stop/starts and random searches. When the tape is used for frequent stop and start operations, streaming movement is beneficial and should be used whenever possible. This can be accomplished by ensuring that any save or restore operation is the only active operation performed by a device connected to this SCSI I/O controller.

Any tape that has been used outside the ranges specified in the previous table for an extended period of time (50 passes in 40 hours of nonstop operation) should not be used as an archival tape. Exposure to the environment will deteriorate the magnetic and physical strength of the tape. Do not store important data on a tape that has been used outside the specified ranges; transfer the data to a new tape for reliable archiving.

4-mm Data Cartridge Erasure

Most bulk eraser devices do not have the capability to erase 4-mm data cartridges. To properly erase an 4-mm data cartridge with a bulk eraser device, the erasure rating must be at least 2000 oersted.

The 4-mm tape drive erases residual data before writing new data on the data tape.

Tape Cartridge Data Capacity

The 4-mm tape cartridge capacity is defined as the amount of data that can be stored or the cartridge. The following variables affect the amount of data that can be stored on a tape cartridge:

- Size of the data file
- Number of file marks per file
- Compatibility mode (2GB or 4GB)
- Media rewrites.

Using the 4.0GB 4-mm Tape Drive

The optional 4.0GB 4-mm tape drive is a half-height device that occupies drive position A or B only.

Status Lights

The 4.0GB 4-mm tape drive has two green status lights and one amber status light. The on and off combinations of the status lights indicate the conditions of the 4-mm tape drive.

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

◯   Ready (green status light)

◈   Read-Write (green status light)

└┐   Disturbance (amber status light)
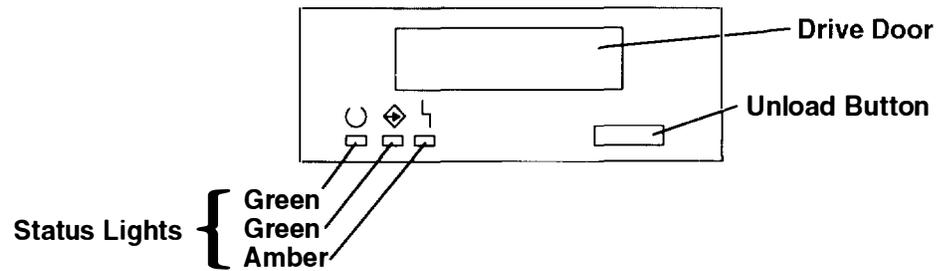
Status Light States

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

	◯ Ready (green)	◈ Read-Write (green)	└┐ Disturbance (amber)
Off	No cartridge installed or fault condition	No cartridge or no activity	No fault condition
Steady	Cartridge installed or loading/unloading		Cleaning required or worn media
Flashing	Power-on self-test in progress	Cartridge activity	Fault condition

Status Lights on the 4.0GB 4-mm Tape Drive			
Status	◯ **Ready (green)**	◈ **Read-Write (green)**	⌐ **Disturbance (amber)**
LED test.	On 2 seconds at power on	On 2 seconds at power on	On 2 seconds at power on
The power-on self-test (POST) is running or the Diagnostic Cartridge is running.	▰ Flashing	▭ Off	▭ Off
One of the following has occurred: • The power is off. • The POST has completed successfully, but no tape cartridge has been loaded.	▭ Off	▭ Off	▭ Off
A tape cartridge has been inserted and the 4-mm Tape Drive is Ready to receive commands from the system.	▱ On	▭ Off	▭ Off
The tape is in motion and the 4-mm Tape Drive is running a device operation or cleaning.	▱ On	▰ Flashing	▭ Off
The 4-mm Tape Drive has detected an internal fault that requires corrective action such as tape cartridge failure, high humidity, or no SCSI terminator. Refer to the service guide or contact your service representative. (See note below)	▭ Off	▭ Off	▰ Flashing
The tape path requires cleaning or a poor quality tape cartridge is being used. See "Cleaning the Tape Path on the 4.0GB 4-mm Tape Drive" on page 3-31	▭ Off or ▱ On	▭ Off or ▰ Flashing	▱ On

Note: If a fault or an error condition occurs, first try to recover by pressing the unload button. If this does not correct the fault, switch off the power to the 4-mm tape drive and then switch on the power to the drive. If the condition continues, call your service representative.

Loading the 4-mm Tape Cartridge

Before loading the tape cartridge, make sure the power is on and the write-protect switch on the tape cartridge is properly set. Refer to "Setting the Write-Protect Tab on 4-mm Tape Cartridges" on page 3-25. The tape drive loads the tape from the cartridge and prepares it for reading and writing.

To load the 4-mm tape cartridge, do the following:

1. Grasp the edges of the 4-mm tape cartridge with the write-protect tab towards you and the window side of the cartridge facing up.

2. Slide the tape cartridge into the opening on the front of the 4-mm tape drive until the loading mechanism pulls the cartridge into the drive and the drive door closes. The ready status light (green) will come on if the load operation was successful.

Window Side of Tape Cartridge

4-mm Tape Cartridge

Write-Protect Tab

Ready Status Light (Green)

Unload Button
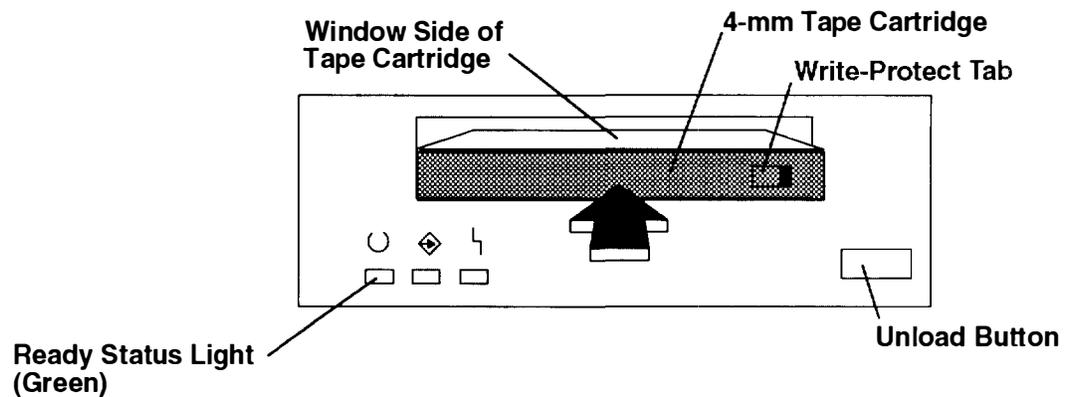
The 4-mm tape drive is ready for data operations when the tape cartridge is inserted. After the cartridge is inserted into the tape drive, the tape takes about 15 seconds to load.

Unloading the 4-mm Tape Cartridge

Before performing the unload operation, make sure the power to the 4-mm tape drive is on.

To unload and eject the tape cartridge, press the unload button. The 4-mm tape drive rewinds the tape and then ejects the tape cartridge from the tape drive.

After pressing the unload button, the following will occur:

1. The Read-Write ⬦ status light will flash during the unload operation.

2. The Ready ◯ status light and the Read-Write ⬦ status light will turn off when the cartridge is ejected from the tape drive.

4-mm Tape Cartridge

Write-Protect Tab

Ready Status Light
(Green)

Read-Write Status Light
(Green)
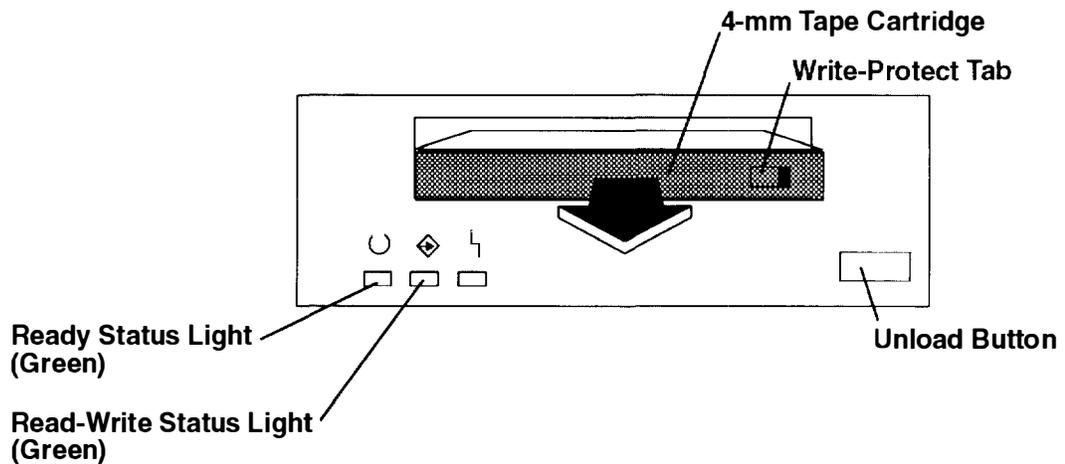
Unload Button

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

If the tape cartridge cannot unload and has to be removed manually from the drive, see "Manually Removing the Tape Cartridge" in *POWERstation and POWERserver Common Diagnostics Information Manual.*

Cleaning the Tape Path on the 4.0GB 4-mm Tape Drive

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

More frequent cleaning may be required if the drive is operated in a dusty environment or in humid conditions. If the dust is allowed to accumulate, the drive has to perform more reads and writes. This can cause data loss, and may be prevented by regularly scheduled cleaning of the drive.

The cleaning cartridge cleans the 4-mm tape drive 50 times before it needs to be discarded. If you attempt to use a 4-mm cleaning cartridge more than 50 times, the tape drive automatically detects the error and ejects the cleaning cartridge with the disturbance status light (amber) remaining on.

Before loading the cleaning cartridge, make sure the power to the 4-mm tape drive is on.

To load the 4-mm cleaning cartridge, do the following:

1. Grasp the edges of the 4-mm cleaning cartridge with the window side of the cartridge facing up.

2. Slide the cleaning cartridge into the opening on the front of the 4-mm tape drive until the loading mechanism pulls the cartridge into the drive.
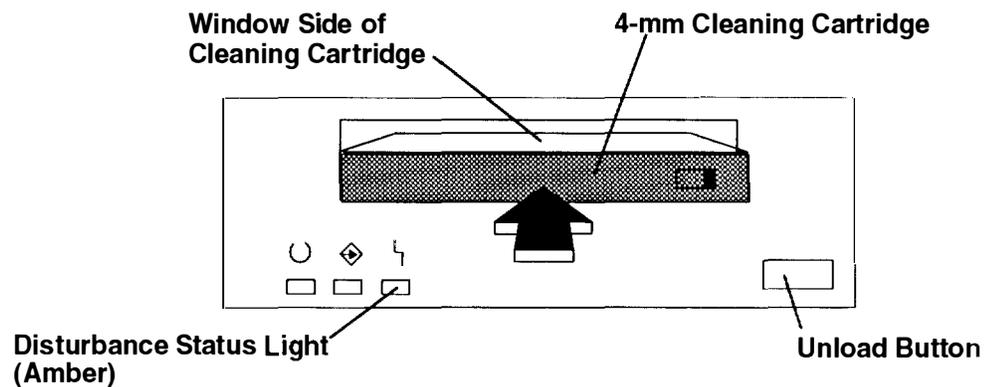
After the 4-mm cleaning cartridge has been fully inserted into the 4-mm tape drive, the following cleaning operations are performed automatically:

1. The cleaning tape is loaded into the tape path.

2. The drive is cleaned by moving the cleaning tape forward for approximately 30 seconds.

3. The tape is unloaded and the cleaning cartridge is ejected from the tape drive when the cleaning operation is complete.

4. A successful cleaning operation is indicated when the disturbance status light (amber) goes off (if it was activated before the cleaning operation).

Chapter 4. Using the Diagnostics

In order to properly run diagnostics, the 7009 Compact Server Model C20 requires AIX Version 4.1.3 or higher. The 7009 Compact Server Model C10 requires AIX Version 3 2 5 (plus enhancements) or a higher version.

Sources for the Diagnostic Programs

Diagnostics can be run from:

- Removable media such as diskettes, tapes, or CD-ROMs

- An internal disk (diagnostics are installed as part of AIX Version 3.2.5 or higher)

- A network, if your system unit has been configured to receive initial program load (PL) from a server over a network.

Note: Diagnostic diskettes contain diagnostic programs that can be run in *standalone mode* only. These diagnostic programs contain a special version of the AIX operating system that only supports the diagnostic programs and cannot be used for normal system activity.

Diagnostic Programs Operating Considerations

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

Diagnostic Version 4.x.x Considerations

Listed below are differences between version 4.1 (and higher) and earlier versions of the diagnostic programs. Use the Service Hints service aid to see additional considerations

1. 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)
   - ESCON Channel adapter (FFC 865)
   - T1/J1 Portmaster Adapter/A (FFC 851)
   - E1 Portmaster Adapter/A (FFC C18)
   - 5080 Attachment Adapter (FFC 858) on Model C10
   - 64 Port adapter (on version 4.1.1 and higher)
2. Diagnostics are now available on 8mm, 4mm, and 1/4 inch tape.
3. 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.

4. Diagnostic support is optionally installed with the AIX operating system and therefore may not be installed on some systems. When diagnostics are installed. the device support for some devices may not get installed. If this is the case, that device will not appear in the diagnostic test list when running disk based diagnostics

5. 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" in this chapter 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 the 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 AIX operating system

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 `hft` 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. Power-on the tape drive if it is an externally attached device.

2. Set the key mode switch to the Service position, and then power-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 that diagnostics are executing.

- The diagnostic CD–ROM disc cannot be ejected from the CD–ROM drive once the diagnostic programs have loaded. The disc can only be ejected after the system has been powered-Off and then powered-On (standalone mode) or after the diagnostics program has terminated (concurrent mode). The disc must be ejected before the system attempts to load the diagnostic programs again.

- The CD-ROM drive from which diagnostics were loaded cannot be tested.

- The SCSI adapter (or circuitry) controlling the CD-ROM drive from which diagnostics were loaded cannot be tested.

- 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. Power-on the CD-ROM drive if it is an externally attached device.

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

4. Power-on the system.

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

6. 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.

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 only 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 8MB 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 8MB 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 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 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 `/etc/consdef` file that is provided on Diagnostic Diskette 4. The file format follows:

```
#
# This is the console definition file used to describe the termira
# 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.

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 powering the system unit off to prevent possible damage to disk data. This is done in one of two ways:

  - If the diagnostic programs were loaded in 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* manual for information about operating the combination system.
- At power-on, the keyboard belongs to the graphics processor. Keyboard control can be switched to the system within two minutes of the system power-on by pressing and holding the Alt key and then pressing the Sw Keybd key.

  Warning: 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 about 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. The following tables list 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. Use the attribute descriptions in the following tables to determine the settings for your terminal.

General Attributes Always Required

The following general attributes are the default settings for the diagnostic programs. Be sure your terminal is set to these attributes.

Note: These attributes should be set before the diagnostic programs are loaded.

Refer to the following table.

General Setup Attributes	3151 /11/31/41 Settings	3151 /51/61 Settings	3161/3164 Settings	Description
Machine mode	IBM 3151	IBM 3151 PC	IBM 3161 or IBM 3164	The diagnostic programs are set to emulate use of the 3161 ASCII Display Terminal. If your terminal can emulate a 5085, 3161 or 3164 terminal, use the following attribute settings. Otherwise, refer to your operator's manual, compare the following attribute descriptions with those of your terminal, and set your attributes accordingly.
Generated Code Set		ASCII		
Screen	Normal	Normal		Uses the EIA-232 interface protocol.
Row and Column	24 x 80	24 x 80		Uses the EIA-232 interface protocol.
Scroll	Jump	Jump	Jump	When the last character on the bottom line is entered, the screen moves down one line.
Auto LF	Off	Off	Off	For the "On" setting, pressing the Return key moves the cursor to the first character position of the next line. For the "Off" setting, pressing the Return key moves the cursor to the first character position of the current line. The CR and LF characters are generated by the New line setting.
CRT saver	Off	Off	10	The "10" setting causes the display screen to go blank if there is no activity for 10 minutes. When the system unit sends data or a key is pressed, the display screen contents are displayed again.
Line wrap	On	On	On	The cursor moves to the first character position of the next line in the page after it reaches the last character position of the current line in the page.
Forcing insert	Off	Off		
Tab	Field	Field	Field	The column tab stops are ignored, and the tab operation depends on the field attribute character positions
Trace			All	Both inbound data (data to the system unit) and outbound data (data from the system unit) to and from the main port can be transferred to the auxiliary port without disturbing communications with the system unit when the Trace key is pressed.

Additional Communication Attributes

The following communication attributes are for the 3151, 3161, and 3164 terminals.

Communication Setup Attributes	3151/11/31, /41) Settings	3151 /51/61, Settings	3161 /3164 Settings	Description
Operating mode	Echo	Echo	Echo	Data entered from the keyboard on the terminal is sent to the system unit for translation and then sent back to the display screen. Sometimes called conversational mode.
Line speed	9600 bps	9600 bps	9600 bps	Uses the 9600 bps (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects eight bits as a data word length (byte).
Parity	No	No	No	Does not add a parity bit, and is used together with the word length attribute to form the 8-bit data word (byte).
Stop bit	1	1	1	Places a bit after a data word (byte).
Turnaround character	CR	CR	CR	Selects the carriage return (CR) character as the line turnaround character.
Interface	EIA-232	EIA-232	EIA-232	Uses the EIA-232 interface protocol.
Line control	IPRTS	IPRTS	IPRTS	Uses the 'permanent request to send' (IPRTS) signal to communicate with system unit.
Break signal (ms)	500	500	500	The terminal sends a 'break signal' to the system unit within 500 ms after the Break key is pressed.
Send null suppress	On	On		Trailing null characters are not sent to the system unit.
Send null			On	Trailing null characters are sent to the system unit.
Response delay (ms)	100	100	100	The terminal waits for 100ms for the system unit to respond.

Additional Keyboard Attributes

The following keyboard attributes are for the keyboard attached to the 3151, 3161 and 3164 terminals.

Keyboard Setup Attributes	3151/11/31/41 Settings	3151/51/61) Settings	3161/3164 Settings	Description
Enter	Return	Return	Return	The Enter key functions as the Return key.
Return	New line	New line	New line	The cursor moves to the next line when the Return key is pressed.
New line	CR	CR	CR	The Return key generates the carriage return (CR) and the line feed (LF) characters. The line turnaround occurs after the CR and LF characters are generated.
Send	Page	Page	Page	The contents of the current page are sent to the system unit when the Send key is pressed.
Insert character	Space	Space	Space	A blank character is inserted when the Insert key is pressed.

Additional Printer Attributes

The following printer attributes are for a printer attached to the 3151, 3161, and 3164 terminals.

Printer Setup Attributes	3151/11/31/41 Settings	3151/51/61 Settings	3161/3164 Settings	Description
Line speed	9600	9600	9600	Uses 19200 or 9600 bps (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects eight bits as a data word length (byte).
Parity	Even	Even	No	
Stop bit	1	1	1	Places a bit after a data word (byte)
Characters	ALL	ALL		
Line end			CR-LF	
Print			Viewport	
Print EOL			Off	
Print null			Off	

Diagnostic Modes of Operation

The diagnostics can be run in three modes:

- Maintenance Mode allows checking of most system resources
- Concurrent Mode allows the normal system functions to continue while selected resources are being checked.
- Standalone Mode allows checking of all the system devices and features

Maintenance Mode

Maintenance mode runs the 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 diagnostics have most of the resources available to check. All of the system resources except the SCSI adapters 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 load the diagnostic controller so you can run the diagnostic programs from the menus. After the diagnostic controller is loaded, follow the normal diagnostic instructions.

Running the Diagnostics in Maintenance Mode

To run the 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 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.

Concurrent Mode

Concurrent mode provides a way to run 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.

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.

The diagnostics also display a menu to assign a resource if another resource is needed

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

To run the 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 diagnostic menus.

Running the Diagnostics in Concurrent Mode

To run diagnostics in concurrent mode, take the following steps:

1. Log on to the AIX operating system as root or superuser.

2. Enter the **diag** command.

3. When the DIAGNOSTIC OPERATING INSTRUCTIONS are displayed, follow the instructions to check out the desired resources.

4. 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 disk drives you had varied to off.

5. Press the Ctrl-D key sequence to log off from root or superuser.

Standalone Mode

Standalone mode provides the most complete checkout of the system resources. This mode also requires that no other programs be running on the system.

Standalone mode can be loaded in three ways:

- From diskettes or other removable load media. This method is the only method available for those systems that do not have the AIX operating system installed

- From a disk within the system unit. This loads the diagnostic programs that are a part of the AIX operating system. The AIX operating system must be installed and configured before the diagnostics can run from it.

- On some system units, built-in diagnostics can be run from read-only memory (ROM). These diagnostics are intended to be used when it is not possible to use the AIX operating system diagnostic programs. The tests provided by the built-in diagnostic programs are not as complete as the AIX operating system diagnostic programs.

Running the Diagnostics in Standalone Mode

To run diagnostics in standalone mode, take the following steps:

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

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

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

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

4. If you want to load the standalone diagnostics from diskettes, 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 diagnostics from the disk, leave diskette and CD-ROM drives empty.

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

   If c07 is displayed, insert the appropriate diagnostic diskette. If necessary, refer to the CEREADME file for additional information.

   If c31 is displayed, follow the instructions to select a console display.

   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 power switch is set to Off.

   When the diagnostics are run from disk, a c99 is displayed when the tests have completed.

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

9. If a problem is detected while the diagnostics are loading, a flashing 888 displays in the operator panel display. See "Reading Flashing 888 Numbers" in this chapter 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. 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.

13. If you loaded the diagnostics from a source other than from a disk or network, turn off the system unit after the shutdown is complete.

Running Built-In Diagnostics

To run the built-in diagnostics, take the following steps:

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

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

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

4. Set the power switch on the system unit to On; then wait until the number 200 displays in the operator panel display.

5. Set the key mode switch to the Service position and immediately press the Reset button.

6. When the MAIN MENU displays, select the Perform Diagnostics option.

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

8. When testing is complete; select option 99 (Return to main menu).

9. Make the appropriate selection from the MAIN MENU or turn off the system unit if you do not want to check out any other areas.

System Exerciser

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 Exerciser 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.

Reading Flashing 888 Numbers on an Three-Digit Operator Panel Display

An flashing `888` number indicates that the diagnostic programs detected an error, and a diagnostic message is ready to be read.

Note: The 9333 displays four-digit SRNs that are not listed in this book. To decode these SRNs, refer to 9333 documentation listed in "Service Hints" in Chapter 5.

Step 1. Determine the Type of Message

The operator panel display should be flashing `888`.

1. Get a problem summary form from the *Problem Solving Guide and Reference* or a blank sheet of paper to record the numbers appearing in the operator panel display.

2. Be sure the key mode switch is set to Normal or Service.

   Note: Every time you press the Reset button, hold it for about one second to allow the program to sense the change.

3. Press the Reset button once. Record the number in the operator panel display. This is the message type.

4. In the following list, go to the step for your message type.

Type 102	Go to Step 2.
Type 103	Go to Step 3.
Type 105	Go to Step 4.
Other	Go to Step 5.

Step 2. Reading the Type 102 Message

A 102 message is generated when a software or hardware error occurs during system execution of an application. Use the following steps and information to determine the content of the Type 102 message. Crash and dump status codes are listed on the following page.

```
102 = Message type
RRR = Crash code
SSS = Dump status code
888 or 103 or 105
```

1. Press the Reset button once and record the crash code. If the crash code is `558`, see the note at the end of this step.
2. Press the Reset button and record the dump status code (dump progress indicator).
3. Press the Reset button again. Look at the number in the operator panel display to answer the following question.

Is 888 **flashing in the operator panel display?**

NO   The message has a Type 103 or 105 message included in it. Go to Step 3 to read out the SRN and FRU information about Type 103 messages. Go to Step 4 to read out the SRN and FRU information about Type 105 messages.

YES   This completes the readout of this message. You can repeat the message by pressing the Reset button. You must power the system unit Off to recover from this halt. Return to the MAP step that directed you here

Note: There are no SRNs associated with this message type. If the crash code is 558 and you were loading the diagnostic diskettes, the problem may be that you used the wrong diagnostic boot diskette. Try using the boot diskette for 8MB systems.

Crash Codes

The following crash codes are part of a Type 102 message.

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 (Dump Status Codes)

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.

Step 3. Reading the Type 103 Message

A Type 103 message is generated when a hardware error is detected. Use the following steps and information to determine the content of the Type 103 message (You may have come here from a Type 102 message. If so, use the same procedure).

1. Press the Reset button and record the first three digits of the six-digit SRN.

   Note: The 9333 machine type displays four-digit SRNs that are not listed in this book. To decode these SRNs, refer to 9333 documentation.

2. Press the Reset button and record the next three digits of the SRN.

3. Each time the Reset button is pressed, three digits of a FRU location code display When all FRU location codes are read out, the operator panel display returns to the flashing `888` or, if another message is waiting to be displayed, a `ccc`. If a `ccc` is displayed repeat this step to receive the next message. Try the first SRN listed; if it does not resolve the problem, try following SRNs in the order listed. If the message contains more than four FRUs, not all FRU location codes will be present.

   Press the Reset button and record the three-digit numbers until a flashing `888` displays. Use the following to identify the numbers being read.

   ```
   103 = Message type
   XXX-XXX = SRN
   c01 1xx 2xx 3xx 4xx 5xx 6xx 7xx 8xx = First FRU location code
   c02 1xx 2xx 3xx 4xx 5xx 6xx 7xx 8xx = Second FRU location code
   c03 1xx 2xx 3xx 4xx 5xx 6xx 7xx 8xx = Third FRU location code
   c04 1xx 2xx 3xx 4xx 5xx 6xx 7xx 8xx = Fourth FRU location code
   ```

4. Identify the SRN. You can cycle through the numbers again by pressing the Reset button.

5. The FRU location codes translate into an eight-digit location code (AB-CD-EF-GH). Each digit of the eight-digit location code is presented as a three-digit number in the operator panel display.

```
     A    B    C    D    E    F    G    H  = Eight-digit location code
c01 1xx  2xx  3xx  4xx  5xx  6xx  7xx  8xx = First FRU location code
c02 1xx  2xx  3xx  4xx  5xx  6xx  7xx  8xx = Second FRU location code
c03 1xx  2xx  3xx  4xx  5xx  6xx  7xx  8xx = Third FRU location code
c04 1xx  2xx  3xx  4xx  5xx  6xx  7xx  8xx = Fourth FRU location code
```

Note: If a ccx (x can be any digit from 2 through 9) is encountered as part of the location code, only the part of the code that is different from the location code of the previous FRU is shown. To form the complete location code of the next FRU, substitute the information following the ccx into the location code of the previous FRU.

For example, if the previous FRU location is:

```
c01 100 200 300 401 500 601 700 800,
```

and the next FRU location is listed as:

```
cc2 602,
```

the complete location code of the next FRU is:

```
cc2 100 200 300 401 500 602 700 800.
```

To identify each digit of the location code (AB-CD-EF-GH), translate the rightmost two digits using the following table. See "Location Codes" in this chapter to determine the physical location of the resource.

xx Value	xx Value	xx Value	xx Value
00 = 0	11 = A	21 = K	31 = U
01 = 1	12 = B	22 = L	32 = V
02 = 2	13 = C	23 = M	33 = W
03 = 3	14 = D	24 = N	34 = X
04 = 4	15 = E	25 = O	35 = Y
05 = 5	16 = F	26 = P	36 = Z
06 = 6	17 = G	27 = Q	
07 = 7	18 = H	28 = R	
08 = 8	19 = I	29 = S	
09 = 9	20 = J	30 = T	

6. The only way to recover from an 888 type of halt is to power the system unit Off Return to the MAP step that directed you here.

Step 4. Reading the Type 105 Message

Type 105 and 103 messages are similar. The Type 105 message contains SRNs in encoded form because the SRN contains characters that cannot be displayed in the operator panel display. Use the following steps and information to determine the content of the Type 105 message. (You may have come here from a Type 102 message. If so, use the same procedure).

1. Press the Reset button and record the first three digits of the SRN.

2. Press the Reset button and record the next three digits of the SRN.

3. Repeatedly press the Reset button, each time recording the numbers in the operator panel display, until c01 is displayed.

4. Each time the Reset button is pressed, three digits of a FRU location code display When all FRU location codes are read out, the operator panel display returns to the flashing 888 or, if another message is waiting to be displayed, a ccc. If a ccc is displayed repeat this step to receive the next message. Try the first SRN listed; if it does not resolve the problem, try following SRNs in the order listed. If the message contains more than four FRUs, not all FRU location codes will be present. Press the Reset button and record the three-digit numbers until a flashing 888 displays. Use the following to identify the numbers being read.

   ```
   105 = Message type
   1xx 2xx 3xx 4xx = encoded SRN
   c01 1xx 2xx 3xx 4xx 5xx 6xx 7xx 8xx = First FRU location code
   c02 1xx 2xx 3xx 4xx 5xx 6xx 7xx 8xx = Second FRU location code
   c03 1xx 2xx 3xx 4xx 5xx 6xx 7xx 8xx = Third FRU location code
   c04 1xx 2xx 3xx 4xx 5xx 6xx 7xx 8xx = Fourth FRU location code
   ```

5. Determine the SRN by translating the rightmost two digits of each position within the encoded SRN (1xx 2xx 3xx 4xx) using the table at the end of the following substep. You can cycle through the numbers again by pressing the Reset button.

6. The FRU location codes translate into an eight-digit location code (AB-CD-EF-GH). Each digit of the eight-digit location code is presented as a three-digit number in the operator panel display.

   ```
       A   B   C   D   E   F   G   H = Eight-digit location code
   c01 1xx 2xx 3xx 4xx 5xx 6xx 7xx 8xx = First FRU location code
   c02 1xx 2xx 3xx 4xx 5xx 6xx 7xx 8xx = Second FRU location code
   c03 1xx 2xx 3xx 4xx 5xx 6xx 7xx 8xx = Third FRU location code
   c04 1xx 2xx 3xx 4xx 5xx 6xx 7xx 8xx = Fourth FRU location code
   ```

Note: If a `ccx` (`x` can be any digit from 2 through 9) is encountered as part of the location code, only the part of the code that is different from the location code of the previous FRU is shown. To form the complete location code of the next FRU, substitute the information following the `ccx` into the location code of the previous FRU.

For example, if the previous FRU location is:

`c01 100 200 300 401 500 601 700 800,`

and the next FRU location is listed as:

`cc2 602,`

the complete location code of the next FRU is:

`cc2 100 200 300 401 500 602 700 800.`

To identify each digit of the location code (AB-CD-EF-GH), translate the rightmost two digits using the following table. See "Location Codes" in this chapter to determine the physical location of the resource.

xx Value	xx Value	xx Value	xx Value
00 = 0	11 = A	21 = K	31 = U
01 = 1	12 = B	22 = L	32 = V
02 = 2	13 = C	23 = M	33 = W
03 = 3	14 = D	24 = N	34 = X
04 = 4	15 = E	25 = O	35 = Y
05 = 5	16 = F	26 = P	36 = Z
06 = 6	17 = G	27 = Q	
07 = 7	18 = H	28 = R	
08 = 8	19 = I	29 = S	
09 = 9	20 = J	30 = T	

7. The only way to recover from an `888` type of halt is to power the system unit Off Return to the MAP step that directed you here.

Step 5. Other Numbers

The only valid message types are types 102, 103, 104, and 105. Type 104 messages are used by the manufacturing plant and should be ignored. If you have any other number displayed, take the following actions:

1. Press the Reset button again and again until a flashing `888` appears in the operator panel display. If you do not get a flashing `888` in the display, you should consider the numbers as *steady* numbers. Go to "Operator Panel Display Numbers" in this chapter, and follow the procedures for analyzing operator panel display codes.

2. When the flashing `888` is displayed, Step 1 on page 4-15.

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 to which the device is set. See Appendix A of the *Installation and Service Guide* to determine the physical location of a device.

Location Code Format for 7135, and 9334

Refer to the 7135 and 9334 service information for their location code formats.

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

System I/O bus identifier.

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

Always 0.
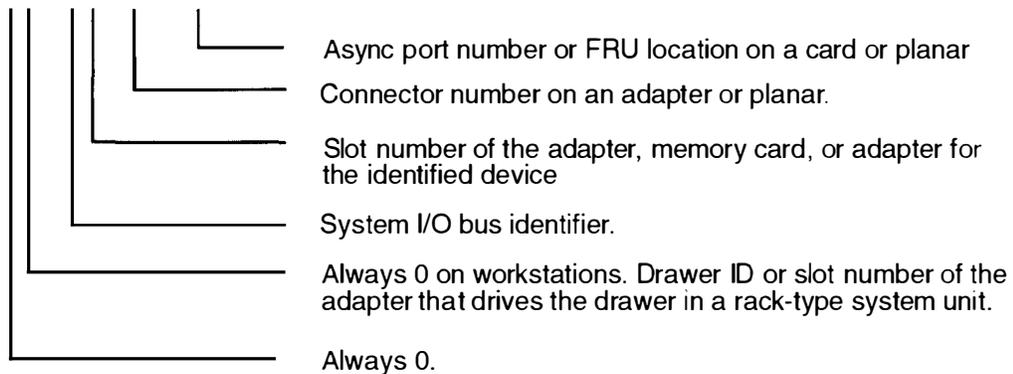
Location Code Format for SCSI Devices

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 Format for 9333 High Performance Disk Drive Subsystems

If the 9333 is connected to only one adapter port, each disk drive module has only one location code; if the 9333 is connected to more than one adapter port, each disk drive module has a location code for each adapter port.

- In 9333 Models 010 and 011 drawer subsystems, the left-hand compartment (viewed from the front) is compartment 0; the right-hand compartment is compartment 3

- In 9333 Models 500 and 501deskside subsystems, the top compartment is compartment 0; the bottom compartment is compartment 3.

Notes:

Adapter in the following diagram refers to the particular High-Performance Disk Drive Subsystem Adapter in use.

The 9333 software location code displayed by the system unit *always* shows the system unit identifier (A) as 0.

If the 9333 is connected to only one system unit, the system unit identifier is always 0 if the 9333 is connected to more than one system unit, you must determine the system unit identifier for the system unit that displayed the location code, and then add that identifier to the A field of the code.

AB - CD - EF - GH

Compartment number 0 through 3.

Always 0.

Adapter connector, 0 through 3.
The connector on the subsystem adapter to which the 9333 is cabled.

Adapter logical addresses are represented by adapter physical connectors as follows:

Connector 0 1 2 3
Address   0 1 2 3
Address   4 5 6 7

Addresses 4 through 7 are used when a 9333 is connected to a system unit via the multiple systems attachment features of a second 9333 that is using addresses 0 through 3.

Always 0.

Adapter slot 1 through 8. The system unit slot in which the subsystem adapter is installed.

System I/O bus identifier.

Always 0.

System unit identifier.

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 on the previous page and in 9333 documentation.

Use the following example to identify these two-character pairs: AB-CD-EF-GH.

Pair	Value	Description
AB	00 00 00 00	Workstation-type system unit. CPU drawer or enclosure in a rack-type system unit. SCSI device drawer in a rack-type system unit. SCSI disk drawer in a rack-type system unit.
	01 02 03 04 05 06 07	Async expansion adapter in slot 1 of CPU drawer. Async expansion adapter in slot 2 of CPU drawer. Async expansion adapter in slot 3 of CPU drawer. Async expansion adapter in slot 4 of CPU drawer. Async expansion adapter in slot 5 of CPU drawer. Async expansion adapter in slot 6 of CPU drawer. Async expansion adapter in slot 7 of CPU drawer.
	08	This is not an invalid number. Slot 8 contains a standard SCSI adapter.
CD	00 00 00	CPU planar. Standard I/O planar. A device attached to the standard I/O planar.
	01 02 03 04 05 06 07 08	Adapter in slot 1 of the I/O planar. Adapter in slot 2 of the I/O planar. Adapter in slot 3 of the I/O planar. Adapter in slot 4 of the I/O planar. Adapter in slot 5 of the I/O planar. Adapter in slot 6 of the I/O planar. Adapter in slot 7 of the I/O planar. Adapter in slot 8 of the I/O planar.
	07 08	Rear Direct-Bus-Attach Disk Drive (7012). Front Direct-Bus-Attach Disk Drive (7012).
	10 11 12 13 14 15 16 17 18 0J	Second I/O planar. Adapter in slot 1 of the second I/O planar or expansion cabinet. Adapter in slot 2 of the second I/O planar or expansion cabinet. Adapter in slot 3 of the second I/O planar or expansion cabinet. Adapter in slot 4 of the second I/O planar or expansion cabinet. Adapter in slot 5 of the second I/O planar or expansion cabinet. Adapter in slot 6 of the second I/O planar or expansion cabinet. Adapter in slot 7 of the second I/O planar or expansion cabinet. Adapter in slot 8 of the second I/O planar or expansion cabinet. Graphics adapter slot.
	0J 0K	TCW SIMM socket. TCW SIMM socket.

Pair	Value	Description
CD	0A 0B 0C 0D 0E 0F 0G 0H	Memory SIMM/card in slot A on the system/CPU planar. Memory SIMM/card in slot B on the system/CPU planar. Memory SIMM/card in slot C on the system/CPU planar. Memory SIMM/card in slot D on the system/CPU planar. Memory SIMM/card in slot E on the system/CPU planar. Memory SIMM/card in slot F on the system/CPU planar. Memory SIMM/card in slot G on the system/CPU planar. Memory SIMM/card in slot H on the system/CPU planar.
	AA AB	Serial Optic Converter in slot AA of system/CPU planar. Serial Optic Converter in slot AB of system/CPU planar.
	0P 0Q 0R 0S	CPU card located in slot P. CPU card located in slot Q. CPU card located in slot R. CPU card located in slot S.
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 standard I/O planar. Built-in Ethernet adapter. Keyboard connector. Mouse connector. Parallel printer connector. Built-in SCSI adapter. Tablet connector.
	S1 S2 S3	Serial port 1 connector. Serial port 2 connector. Serial Port 3 connector.
	1A 1B 2A 2B	Port A of the Serial Optic Converter in slot AA of the CPU planar. Port B of the Serial Optic Converter in slot AA of the CPU planar. Port A of the Serial Optic Converter in slot AB of the CPU planar. Port B of the Serial Optic Converter in slot AB of the CPU planar.
	11 12 13 14 21 22 23 24	Remote async node 1 on line 1. Remote async node 2 on line 1. Remote async node 3 on line 1. Remote async node 4 on line 1. Remote async node 1 on line 2. Remote async node 2 on line 2. Remote async node 3 on line 2. Remote async node 4 on line 2.
GH	01 02 03 04 05 06 07 08	Memory SIMM or DIMM in location 1 on the memory card. Memory SIMM or DIMM in location 2 on the memory card. Memory SIMM or DIMM in location 3 on the memory card. Memory SIMM or DIMM in location 4 on the memory card. Memory SIMM or DIMM in location 5 on the memory card. Memory SIMM or DIMM in location 6 on the memory card. Memory SIMM or DIMM in location 7 on the memory card. Memory SIMM or DIMM in location 8 on the memory card.

Pair	Value	Description
GH	0A 0B 0C 0D 0E 0F 0G 0H 0J 0K	Video RAM in slot A of the graphics adapter. Video RAM in slot B of the graphics adapter. Video RAM in slot C of the graphics adapter. Video RAM in slot D of the graphics adapter. Video RAM in slot E of the graphics adapter. Video RAM in slot F of the graphics adapter. Video RAM in slot G of the graphics adapter. Video RAM in slot H of the graphics adapter. Video RAM in slot J of the graphics adapter. Video RAM in slot K of the graphics adapter.
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
	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.	

Description of the Service Request Number List

The service request number (SRN) list is in numerical sequence by the SRN.

The SRNs listed in this chapter are for all systems and devices for which this version of the diagnostic programs can produce an SRN.

The columns in the table are used as follows:

Service Request Number

Usually a six-digit number (9333 uses four digits) representing a specific failure of a specific function.

Source of SRN

SRN source codes identify the program or procedure that produced the SRN:

A   The SRN is from a *steady* number in the operator panel display
B   The SRN is from a MAP callout.
C   The SRN was due to a missing resource at configuration time.
D   The SRN is from a diagnostic test after complete isolation testing.
E   The SRN is from a POST failure.
F   The SRN is from a diagnostic test after partial isolation testing.
G   The SRN is from the Error Log Analysis program.
H   The SRN is from a diagnostic message after a flashing 888 .
G   The SRN is from the Error Log Analysis program.
J   The SRN is from built-in ROM diagnostics.
K   The SRN is from off-line diagnostics.

Failing Function Codes

These numbers represent functional areas of the system unit.

Failure Percent (%)

The numbers in this column show probability percentages of failing functions. The total in this column may exceed more than 100% because some functions may be in more than one option.

Description and Action

This column lists a brief description of the failure this SRN represents It also contains instructions as to what to do to continue the problem analysis.

Chapter 5. Using the Service Aids

Introduction to Service Aids

The diagnostic programs contain programs called service aids. The service aids are used to display data and do additional testing.

The following service aids are provided:

- Service hints
- Display previous diagnostic results
- Display or change configuration or vital product data
- Display or change diagnostic test list
- Disk media
- Diskette media
- Local area network (LAN)
- SCSI bus
- Display test patterns
- Microcode download
- Product topology
- Display/alter bootlist
- Trace
- Dials and LPFK configuration
- Diagnostic diskette creation
- Disk-based diagnostic update
- Hardware error report
- Display test patterns for the multimedia video capture adapter
- Periodic Diagnostics Service Aid
- Generic Microcode Download Service Aid
- Disk Maintenance Service Aid
- Backup/Restore Media Service Aid
- Multiprocessor Service Aid
- Service Aids for use with Ethernet.
- BUMP Service Aid.

These service aids are described in the following topics.

Service Hints

The Service Hints service aid reads and displays the information in the CEREADME file from the diagnostics source (diskettes, disk, or CD-ROM). 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 Enter key to page forward through the information or the – (dash) and Enter keys to page backward through the file.

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 or Change Configuration or Vital Product Data (VPD)

Note: The following AIX operating system commands are not available for use when you load this service aid from diskettes.

This service aid allows you to display and change configuration data and vital product data (VPD).

Use the **lscfg** command to copy the contents of the configuration and VPD files to another file or to a printer. This command identifies the resources that have diagnostic support. For more information about the **lscfg** command, see the AIX operating system information.

In the following examples, the first example copies the configuration data and VPD to a file named **/u/mine/VPD**. The second example prints the configuration list. The third example displays the VPD on the screen.

```
lscfg -v > /u/mine/VPD
lscfg | enq
lscfg -v | pg
```

Display Configuration

This service aid displays a list of the resources installed on this system.

Display Vital Product Data

This service aid displays the VPD for all of the resources installed on this system. Use the Page Down and Page Up keys to see the data for all resources.

Some of the data displayed by this service aid may have the characters "ME" added at the beginning of the data. The "ME" stands for "Manually Entered," and is used to indicate that the data that follows was obtained from user input instead of from hardware VPD.

Display/Alter Vital Product Data

Warning: If this service aid was loaded from a source other than the disk drive or network, any changes or additions you make to the VPD data will be lost when you set the power switch to Off.

This service aid allows you to display and alter the VPD for any resource. When you select this service aid, a menu allows you to select the desired resource.

Change Configuration

Warning: If this service aid was loaded from a source other than the disk drive or network, any changes or additions you make to the VPD data will be lost when you set the power switch to Off.

This service aid allows you to add or delete data for the drawer data from the configuration list. This service aid is used to add nonmachine-readable data to the configuration list

Display or Change Diagnostic Test List

During power-on self-test (POST), the diagnostic controller uses the diagnostic test list to determine which resources to check.

This service aid provides a way to delete a resource from the diagnostic test list and a way to add a deleted resource back into the diagnostic test list. This service aid also provides a way to display the diagnostic test list.

Disk Media

This service aid provides a Format Disk service aid and a Certify Disk service aid.

Format Disk

There are two options available to format a disk, and an option that can be used to overwrite all accessible blocks on the disk with a user-selectable pattern.

Format without Certify

The format option writes all of the ID fields and writes a bit pattern in all of the data fields. This option does *not* reassign data blocks that are bad.

Format and Certify

The format and certify option writes all of the ID fields and writes a bit pattern in all of the data fields. It also reassigns any data blocks found to be bad during formatting. If there are too many bad data blocks, a message is sent to alert you.

This service aid should be used to completely erase the existing data on a disk. The diagnostic programs may instruct you to use this service aid when data on a disk is found to be badly damaged.

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 will be 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. Run the "Erase Disk" Service Aid to overwrite the data on the drive.

2. Do a format without certify.

3. Run a second pass of the erase service aid.

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

1. Format the drive.

2. Check the defect map by running the Erase Disk Service Aid.

   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 will be 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 of the sectors on this drive cannot be overwritten. The new bad blocks will not be overwritten.

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

Certify Disk

The Certify Disk service aid reads all of the ID and data fields. It checks for bad data in the ID and data fields. If there are too many bad data blocks, a message is sent to alert you.

Diskette Media

This service aid 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.

Local Area Network

This service aid provides a means to analyze local area network (LAN) problems related to attached Ethernet, Token-Ring, and FDDI adapters. The service aid allows you to do the following:

- Monitor the ring (Token-Ring only). Abnormal conditions are reported.

- Test connectivity. Data is transferred between two stations, and the results are reported

SCSI Bus

This service aid provides additional testing for SCSI bus problems and should be used only after the normal diagnostic test programs do not find a problem.

A **SCSI Inquiry** command is sent to a SCSI device you select from the SCSI BUS ADDRESS SELECTION menu; test results are then displayed. To analyze a SCSI bus problem, start with only one device attached; then add one device at a time until you identify the failing device. *Always* use a terminator at the end of the SCSI bus.

Display Test Patterns

Note: This service aid should not be run in a multiwindow environment.

This service aid provides a way to display the test patterns needed to adjust the 5081, 6091, and 8517 displays. Select the pattern you need from the menu.

Microcode Download

Microcode Download is a service aid that allows microcode resident on devices such as disk or tape drives to be updated. This service is normally needed when a problem is discovered or an enhancement is made to existing microcode.

This service aid presents you with a list of the drives that use microcode. Select the type drive on which you are installing the code, and follow the displayed instructions.

Product Topology

The Product Topology Data System has been created to enhance product and order quality within this system family.

Introduction

The Product Topology Data System records and maintains the following data:

- Machine configuration, including both Feature Code and Manufacturing Feature Bill of Material nomenclature
- Machine contents, including part numbers and EC levels
- History of actions taken with machine hardware.

Data collection and recording for a machine begins with the initial order and continues through the manufacturing process into field service. This physical history, combined with the current configuration, is a valuable resource in managing product quality. Additionally, current machine configurations as reported from the field through Update Diskettes are used as a database for developing and improving Miscellaneous Engineering Specification (MES) upgrade orders and their installability.

Service Aid Operation

The machines leave the plant of manufacture with a Product Topology System Diskette, which contains the latest version of this service aid.

This service aid can be executed in one of the following ways:

- By following the instructions that accompanied the Product Topology System Diskette included with the machine or included with the MES shipment from the plant of manufacture (the preferred method).
- By executing the Product Topology service aid from the operating system-based diagnostics on the disk drive.
- By executing the standalone diskette-based or CD-ROM disc-based diagnostics for machines that do not have, or do not plan to have, the operating system installed.

This service aid can be executed concurrently with other operating system applications; it is not necessary to remove the machine from normal operating service to run the program In the case of a disk drive failure, or when the standalone diskette diagnostics package or the diagnostic CD-ROM disc is used, the Product Topology service aid should be run from the disk drive *after* the machine is restored to normal operation.

Initial Installation

The first time the Product Topology service aid is executed, or after having re-installed the operating system, you will be prompted to supply information on a screen that is similar to the following.

```
PRODUCT TOPOLOGY SYSTEM RECORD                                    802601

The following information lists the current system record data.
Any data in brackets [] may be changed or added at this time.
Menu items with an asterisk (*) require a valid data entry.


* Machine serial number. . . . . ie. 2612345. . . . . . . . . . . . . []
* Machine type . . . . . . . . . . . . ie. 7015 . . . . . . . . . . . . . . . . []
* Machine model . . . . . . . . . . . ie. 98F . . . . . . . . . . . . . . . . []
* Name (may be individual or company) . . . . . . . . . . . . . . . . []
* Address( number and street) . . . . . . . . . . . . . . . . . . . . . . . []
* Address (city and state). . . . . . . . . . . . . . . . . . . . . . . . . . []
  Address (zip) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . []
  Contact Name. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . []
  Contact Phone . . . . . . . . . . . ie. 512-555-1212 . . . . . . . . []
  System number . . . . . . . . . . ie. 0000HBF . . . . . . . . . . . . []
  Customer number . . . . . . . . ie. 1234567 . . . . . . . . . . . . . []
  Electronic address . . . . . . . . . . . . . . . . . . . . . . . . . . . . . []


F1=Help          F2=Refresh          F3=Cancel          F4=List
F5=Undo          F7=Commit           F10=Exit
```

Notes:

1. The serial number and machine type can be found on a label on the front or top of your system unit.

2. The model number can be found on the product logo on the front panel of the system unit.

Indentify the Location of SCSI Devices

You will next be asked to identify the location of all detected SCSI devices (either 'Internal' or 'External'), using a screen that is similar to the following.

```
PRODUCT TOPOLOGY SCSI DEVICE LOCATION                                802603

A new SCSI device was detected that is not in the Product Topology
Data.  Please enter the SCSI device location ('IN' for internal,
'EX' for external) for the following device:

    Title . . . . . . . . . . . . . . . . . . . .    857 MB SCSI Disk Drive
    Part Number . . . . . . . . . . . . .
    Part Location . . . . . . . . . . . .    00–00–0S–00
    Resource Name . . . . . . . . . .    hdisk0
    EC Level . . . . . . . . . . . . . . .
    Serial Number . . . . . . . . . . . .    00003453
    Displayable Message . . . . . .


When finished, or when no further information is available,
use 'Commit' to accept the data.


SCSI Device Location (Internal or External)...      ??      +

F1=Help          F2=Refresh              F3=Cancel              F4=List
F5=Undo          F7=Commit               F10=Exit
```

Note: This screen will appear for each SCSI device on your system that has not had a location determined for it.

Subsequent Executions

After the initial execution of this service aid, subsequent executions will allow you to verify or modify any of the previously entered information.

Note: Always be sure to verify that the Machine Type and Machine Model are correct for your machine. These values may need to change if your machine is upgraded to a new or different model.

Completing the Product Topology Process

The final step of the product topology process is to write an Update Diskette which is returned to the plant of manufacture. When you see the following screen, follow the instructions carefully.

```
PRODUCT TOPOLOGY SERVICE AID                              802604

REMOVE.........the diskette, if any, from the diskette drive.
INSERT............the Product Topology Update Diskette into the drive.

        If an EC, MES, or external device was installed, use
        the Update Diskette that was shipped with the EC, MES,
        or external device. Otherwise, use one of the Update
        Diskettes shipped with the system and stored in the
        Service Information Binder.

When finished, press Enter.




F1=Help              F3=Cancel
F10=Exit             Enter
```

When the diskette-writing procedure is finished, the Product Topology Service Aid menu automatically returns to the screen.

Note: Do not remove a diskette from the drive until:

- The diskette drive light has turned off.
- Prompted to do so by the software.
- The Product Topology Service Aid procedure terminates, and the Product Topology Service Aid menu is displayed.

Older Versions of the Service Aid

If you are running an older version of the Product Topology Service Aid, you will see screens that are different from the ones shown here. Either upgrade your version of this service aid to the latest level (using the diskette and instructions that came with your machine or MES), or contact the support center for assistance.

Machines without Product Topology

Some disk drive machines do not have product topology data installed because the Product Topology service aid has not been run from disk. When the Product Topology service aid is run from the diskette diagnostics package or from the diagnostic CD-ROM disc, the system does not record product topology data onto the disk drive. When the Product Topology service aid is eventually run from the disk drive following an MES installation or repair action, the program will ask you to provide all of the machine-specific information in the same manner as is done for an Initial Installation.

Display/Alter Bootlist

This service aid allows you to display, alter, or erase the list of the IPL devices from which the system will attempt to load either the AIX operating system or the diagnostic programs

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.

Trace

The Trace service aid is used as a tool to correct problems with microcode on either a serial disk adapter or a serial disk controller. This service aid is intended for use by trained service representatives.

Dials and LPFK Configuration

This service aid configures Dials or lighted programmable function keys (LPFK) devices to be used on the S1 or S2 serial port. Until these devices are configured, they cannot be tested by the diagnostic programs. If Dials or LPFK devices attached to the S1 or S2 serial port do not appear on the diagnostic test list, use this service aid first to configure the device.

Diagnostic Diskette Creation

Notes:

1. Before creating diagnostic diskettes with this service aid, any service update software (PTFs) should be applied first.

2. This service aid is not supported on version 4.1 or later of the diagnostic package.

The Diagnostic Diskette Creation service aid requires at least 10,000 blocks of free space in the **root** directory and 8800 blocks of free space in the **/tmp** directory. If you do not have enough free space in these directories, an error message displays when you run this service aid.

Note: If you receive any messages about missing files when you run this service aid. the diskettes created by this service aid may not work properly. The files identified by the messages may be necessary for these diskettes to work properly.

This service aid creates diagnostic diskettes that are customized to the system they were created on. The diskettes created by this service aid contain only the diagnostics for the devices on the system the service aid is run on.

Disk-Based Diagnostic Update

This service aid is used to update to the most current level, the diagnostic programs stored on the disk. The update is performed by inserting all diskettes containing the service update software (PTFs) into the diskette drive when the service aid prompts you to do so.

Hardware Error Report

This service aid provides a tool for viewing the system error log for hardware errors

The service aid will display information concerning error log entries classified as hardware errors. This service aid scans the error log for hardware type errors and then displays the data to the user. The service aid has the option to format some error log entry types making them more meaningful to the user.

Display Test Patterns for the Multimedia Video Capture Adapter

Note: This service aid is not available on AIX diagnostics version 4.1 or later.

The Multimedia Video Capture Adapter service aid provides a selection of patterns to be used for adjusting the multimedia video capture adapter. Select the appropriate pattern from the choices listed on the Multimedia Video Service Aid menu.

Multiprocessor Service Aid

This service aid uses the **cpu_state** command to display or change processor states for the next boot. This command can also be used directly from the AIX command prompt.

Display Processor States

This service aid displays the states of physical processors.

Disable a Processor

This service aid is used to disable a processor. The disabling is taken into account during the next boot.

Enable a Processor

This service aid is used to enable a processor. The enabling is taken into account during the next boot.

Service Aid for Use with Ethernet

This service aid provides a tool for diagnosing Ethernet problems.

BUMP Service Aid

This service aid is used to manage information relating to the BUMP, such as a diagnostics flags, service support phone numbers, modem configuration parameters, and the firmware stored in the flash EPROM.

Display or Change Flags and Configuration

This service aid is used to:

- Display remote support phone numbers.
- Display modem configuration

- Change remote support phone numbers
- Change modem configuration.

Save or Restore Flags and Configuration

This service aid allows the diagnostic modes and remote support phone numbers to be saved in a file. In this way, this information is easy to restore in cases where the NVRAM is replaced or corrupted.

Flash EPROM download

This service aid allows you to update the flash EPROM using a binary file.

Periodic Diagnostics Service Aid

The Periodic Diagnostic service aid performs the following functions:

- Execute diagnostics daily on hardware resources at a user selected time.

- Execute diagnostics against a device whenever a hardware error is logged in the system error log (concurrent error log analysis).

Generic Microcode Download

This service aid is used to restore a program from diskette or tape which is then used to update the microcode on a device or adapter. The restored program will provide instructions relevant to updating microcode on the device or adapter.

Disk Maintenance Service Aid

The Disk Maintenance service aid performs the following functions:

- Copies the entire contents of a selected disk (including the volume ID) to another disk (Disks must have comparable capacities.)

- Displays the contents of a selected disk sector and allows the data in that sector to be altered.

The Disk Maintenance service aid is intended to be used when a disk must be replaced and the data residing on the disk must be saved. The service aid is also intended to be used to restore corrupted data in a sector of the disk by manually correcting parts of the data that are incorrect. To do this the user must be knowledgeable of what the data was before it became corrupted.

Backup/Restore Media Service Aid

This service aid is used to verify that a tape or diskette device used to backup files to media is functioning correctly. The service aid works by writing the file */usr/lpp/diagnostics/CEREADME* to the selected media. The file is then restored to the */tmp* directory where a comparison of the restored and the original file is performed. The user is allowed to select the backup format (tar, backup or cpio) to be used.

Chapter 6. Using the System Verification Procedure

System Verification Procedure

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

When you are analyzing a hardware problem, you should use the "Hardware Problem Determination Procedure" in Chapter 7.

Step 1. Considerations before Running This Procedure

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.

This procedure requires use of all of the system resources. No other activity can be running on the system while you are doing this procedure.

- This procedure requires a display connected to the video port or a tty terminal attached to the serial connector on the system unit or the S1 connector of a serial dual-port cable.

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

- This procedure runs the diagnostic programs in Standalone mode from disk, server, diskette, or a CD-ROM disc. If the diagnostic programs are installed on disk, these procedures should be run from disk. 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" in Chapter 4.

Note: If while the diagnostics are loading, the system unit stops with 260, 261, or 262 displayed in the three-digit display and the console display is blank, verify that the ASCII terminal (if used) is properly connected to the serial port or S1 connector on a serial dual-port cable. Press the 1 (one) key on the console keyboard to continue loading the diagnostics.

- If a console display is not selected, the diagnostics stop with c31 in the three-digit display. The instructions for selecting a console display 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 graphics subsystem, 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.

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

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

5. If you are loading the diagnostics from diskettes or a CD-ROM drive and running them from a tty terminal:

   - The attributes for the terminal must be set to match the defaults of the diagnostic programs.
   - If you need to change any settings, record the normal settings, and be sure the terminal attributes are set to work with the diagnostic programs. If needed, see "Running the Diagnostic Programs from a tty Terminal" in Chapter 4.
   - Return to substep 6 when you finish checking the attributes.

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

   If c01 is displayed, insert the first diagnostic diskette.

   If c07 is displayed, insert the next diagnostic diskette.

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

   Refer to Appendix B for a description of any other c messages on the three-digit display.

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 from 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.

   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. When you have checked all of the resources you need to check, go to Step 5.

Step 5. Stopping the Diagnostics

1. If diagnostics are being run from disk or from a network server, the system first should be shut down using the following procedure:

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

   b. Press F3 once, then follow the displayed instructions to shut down 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 7. Hardware Problem Determination

Hardware Problem Determination Procedure

Use this procedure to obtain 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 Running This Procedure

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

- The diagnostic programs can use a display connected to the video port or a tty terminal attached to a serial port.

- The Diagnostic Operating Instructions do *not* display on displays attached to the 5085 or 5086 graphics subsystem.

- 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 4.

- Go to Step 2.

Step 2

(from Step 1)

AIX Version 3.2.5 or higher contains the diagnostic programs. Other operating systems may not contain diagnostic programs.

Is Version 3.2.5 or higher 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 the operating system is accepting commands.

Is Version 3.2.5 or higher of the operating system accepting commands?

NO   Try the following:
               1. Stop the operating system using the proper command for your system. If you cannot, set the power switch to Off.
               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, more extensive 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 using the proper command for your operating system.
2. After the operating system is stopped, turn off the system unit.
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 Diagnostic Operating Instructions are displayed, or wait for three minutes

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

NO   Do the following to shut down your system:
1. At the system prompt, stop the operating system using the proper command for your operating system.
2. After the operating system is stopped, turn off the system unit.
3. Go to Step 6.

YES   Go to Step 10.

Step 6

(from Steps 3, 4, 5, and 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. 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 Normal and back to Service to indicate to the diagnostics there is no console display. If you cannot select a console display, go to Step 20.

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

   - The power-on light does not come on, or comes on and does not stay on.
   - The same number is displayed in the three-digit display for longer than three minutes

- The number 888 is flashing in the three-digit display.
- The three-digit display is blank.
- The system stops with two or more numbers between 221 and 296 alternating in the three-digit display.
- The Diagnostic Operating Instructions display.

5. 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 three-digit display and the Diagnostic Operating Instructions is 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 on the Problem Summary Form 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 three-digit display.	The number must be other than c31. See substep 4 for this number. Go to Step 7.
The system stops with 888 flashing in the three-digit display.	Go to Step 8.
The system stops with a blank three-digit display, and the Diagnostic Operating Instructions are *not* displayed correctly.	Go to Step 9.
The three-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 three-digit display.	Go to Step 16.

Step 7

(from Steps 6 and 18)

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

Three-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, turn off the system unit. Go to Step 6. 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 23.
Any other number	Record and report SRN 101-*xxx* (where *xxx* is the number displayed in the three-digit display). **STOP**. You have completed these procedures.

Step 8

(from Steps 6 and 18)

A flashing 888 in the three-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 4 to:
    - Read out 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 below. Otherwise, go to substep 5 below
3. Record the SRN and other numbers read out on the Problem Report Form.
4. Report the SRN to the service organization. Keep the other numbers you read out for the service representative to use to determine the location of the failing FRU.
5. **STOP**. You have completed these procedures.

Step 9

(from Steps 6, 18, 20, and 24)

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, and 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, 12, and 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 Termina` 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 `Diagnostics`.

3. Press the Enter key.

4. In the table on the following page, find the menu or system response you received when you selected `Diagnostics`. Follow the instructions given in the Action column.

System Response	Action
The system does not respond to selecting `Diagnostics.`	Go to Step 11.
The Diagnostic Selection menu is displayed.	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 three-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.

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 take the Action for it.

Diagnostic Response	Action
An SRN is displayed.	Go to Step 15.
The system stopped with a number displayed in the three-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 and 13)

A flashing 888 in the three-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 4 to:

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

2. Record the SRN on the Problem Report Form.

3. Report the SRN to the service organization. Keep the other numbers you read out for the service representative to use to determine the location of the failing FRU.

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

Step 15

(from Steps 12 and 13)

The diagnostic programs produced an SRN for this problem.

1. Record the SRN and other numbers read out on the Problem Summary Form.

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 three-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 drive?

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

          STOP. You have completed these procedures.

Step 17

(from Steps 21 and 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 4 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 system unit power switch to Off.

2. Get the diagnostic diskettes or CD-ROM disc for your system unit. If your system does not contain a diskette drive or a CD-ROM drive with the diagnostic disc, continue with substep 4 on page 7-10.

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 system unit power switch to On. If c07 is displayed in the three-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 Normal then back to Service to indicate to the diagnostics that there is no console display. If you cannot select a console display, go to Step 20.

5. 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 three-digit display.
   - The same number is displayed in the three-digit display for longer than three minutes
   - The number 888 is flashing in the three-digit display.
   - The three-digit display is blank.
   - The Diagnostic Operating Instructions display.

   Note: If while the diagnostics are loading, the system unit stops with 260, 261, or 262 displayed in the three-digit display and the console display is blank, verify that the ASCII terminal (if used) is properly connected to the serial port or S1 connector on a serial dual-port cable. Press the 1 (one) key on the console keyboard to continue loading the diagnostics.

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

Symptom	Action
The system stops with a blank three-digit display, and the 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 three-digit display, and the Diagnostic Operating Instructions are *not* displayed correctly.	Go to Step 9.
The system stops with 260, 261, or 262 displayed in the three-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 three-digit display.	The number must be other than c07 or c31. See substep 4 above for these numbers. Go to Step 7.
The system stops with 888 flashing in the three-digit display.	Go to Step 8.
The system stops with two or more numbers between 221 and 296 alternating in the three-digit display.	Record and report SRN 111-101. **STOP**. You have completed these procedures.

Step 19

(from Steps 12 and 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, check your configuration before calling the software support center.

Step 20

(from Steps 6 and 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 Step 2 and 24)

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

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

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 is provided on diskette and CD-ROM disc.

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

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

YES   Go to Step 17.

Step 23

(from Step 7)

If using an ASCII terminal, verify that the ASCII terminal is properly attached to the system unit serial connector or the S1 connector on the serial dual-port cable.

Three-Digit Display Number	Action
260	If the console display is directly attached to the system unit using a graphics adapter, go to Step 24. Otherwise, press the 1 (one) key on the ASCII terminal keyboard, then go to Step 24.
261	Press the 1 (one) key on the ASCII terminal keyboard, then go to Step 24.
262	A keyboard was not detected. If a keyboard is attached to the keyboard connector (K) on the system unit, record and report SRN 101-262; then go to Step 24. Otherwise, press the 1 (one) key on the ASCII terminal keyboard, then go to Step 24.

Step 24

(from Step 23)

Find your symptom in the following table, then follow the instructions in the Action column.

Symptom	Action
Information is not displayed correctly on the console display (for example, the information is distorted, blurred, or not readable).	Go to Step 9.
An SRN is displayed on the console display.	Record and report the SRN. **STOP.** You have completed these procedures.
The Main Menu is displayed on the console display.	Go to Step 21.
Neither an SRN nor the Main Menu is displayed on the console display.	Go to Step 21.

Chapter 8. Moving the System Unit

Moving the System Unit

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

Note: For a translation of the safety notices, refer to the *System Unit Safety Information*, Order Number SA23-2652.

The following danger and caution notices should be observed if you decide to move your unit:

DANGER

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

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

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

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

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

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

DANGER

> **To prevent 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.

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

Appendix A. SCSI Device Address Record

Use the *About Your Machine* document to determine which devices are initially installed in your system unit. Be sure to update the SCSI address record whenever you install or remove additional internal or external SCSI devices.

Using the SCSI Terminators

If no SCSI devices are connected to the external SCSI connector, make sure the system unit SCSI terminator is inserted into the system unit SCSI connector.

SCSI Connector

**System Unit
SCSI Terminator**
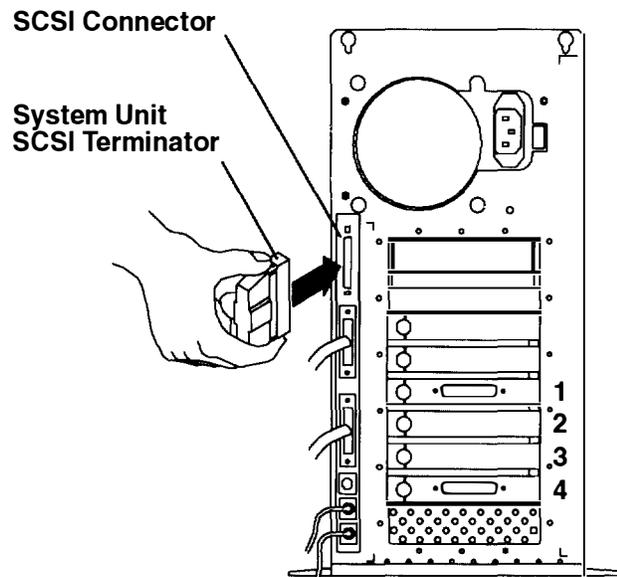
When attaching any external SCSI devices, make sure the last SCSI device is properly terminated.

System Unit SCSI Terminator

SCSI Cable

SCSI Device

SCSI Device Terminator
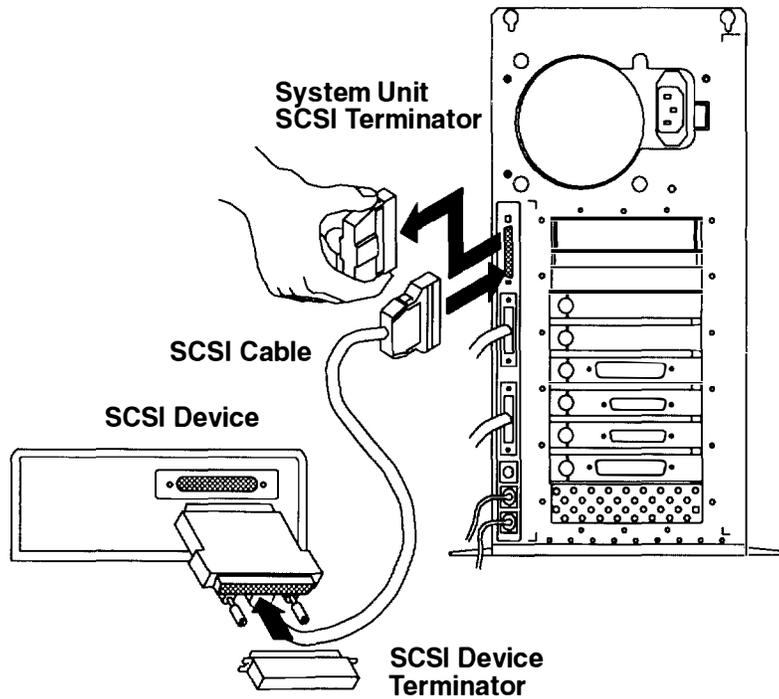
Notes:

- The system unit SCSI terminator is not the same as the SCSI device terminator.

- When disconnecting the SCSI cable or SCSI terminator from the SCSI connector on the system unit, do *not* use a rocking or side-to-side motion; this can damage the SCSI connector. To disconnect the SCSI cable or terminator, gently pull directly outward from the system unit.

Built-in SCSI Adapter

The 7009 system unit contains a built-in SCSI adapter that supports up to four internal devices and two external devices. The total external cable length cannot exceed 2.25 meters (7.3 feet).

Notes:

1. Each SCSI device attached to the built-in SCSI adapter must have a unique address from 0 through 6.

2. The last externally attached device must be terminated. If no external SCSI device is attached, the system unit SCSI terminator must be inserted in the system unit SCSI connector.

Externally Attached Devices

Device _____

Address _____

Device _____

Address _____

T = Terminator

Internal Devices

Built-In SCSI Adapter

SCSI Disable Jumpers

Upper Media Drive

Address _____
(Factory Installed: Address = 5)

Lower Media Drive

Address _____
(Factory Installed: Address =6)

Upper Disk Drive

Address _____
(Factory Installed: Address = 1)

Lower Disk Drive

Address _____
(Factory Installed: Address = 0)

T
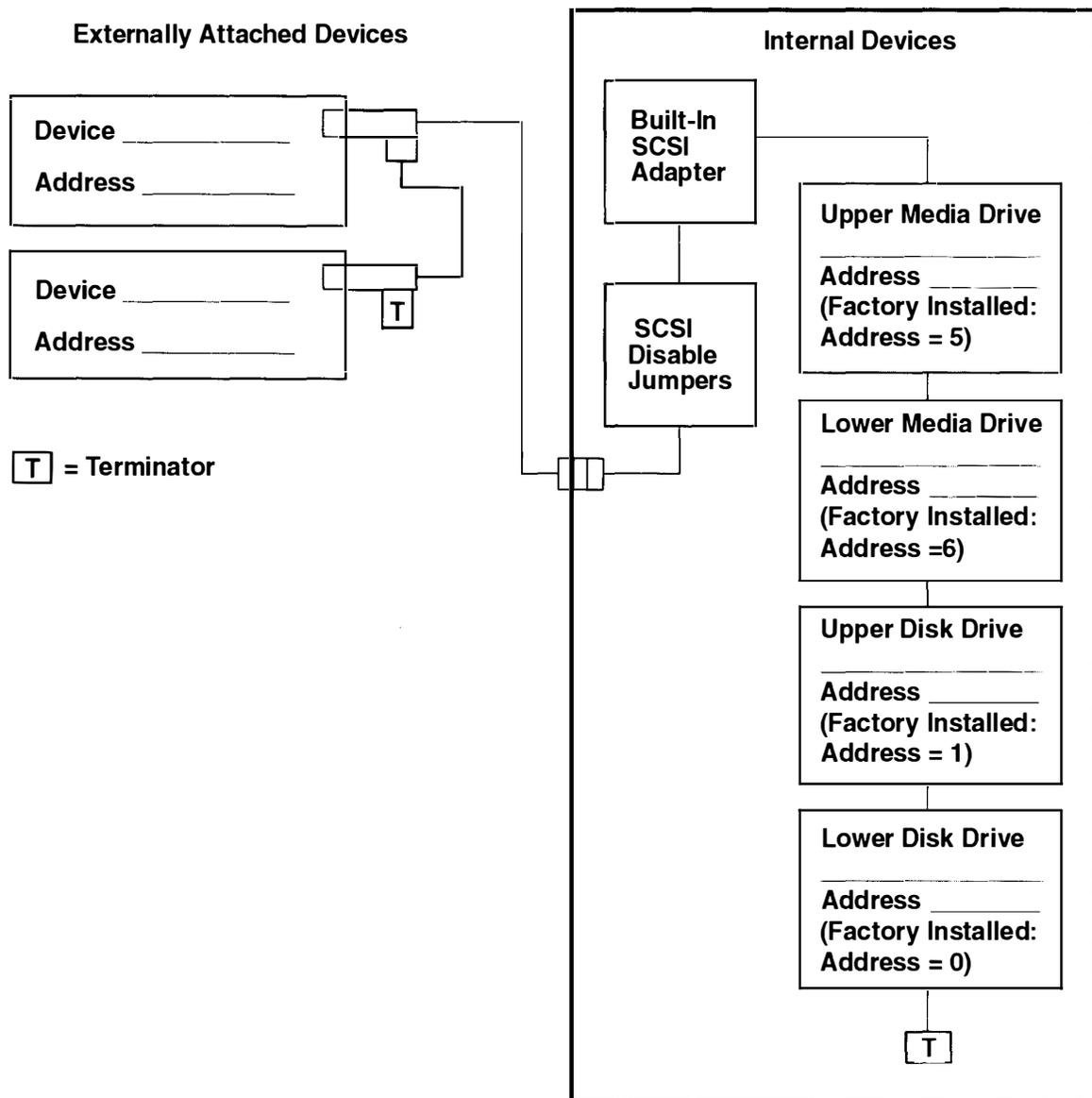
Optional Fast/Wide SCSI Adapter

Optional Fast/Wide SCSI adapters can be installed in the system unit. An optional Fast/Wide SCSI adapter can be connected to four internal disk drives and four external devices. The total external cable length cannot exceed 3 meters (9.8 feet).

Notes:

1. Each SCSI device attached to the Fast/Wide SCSI adapter must have a unique address from 0 through 15.

2. The last externally attached device must be terminated.

Externally Attached Devices   **Internal Devices**

| Device _____ | | **Upper Media Drive** |
| **Address** _____ | | **Address** _____ (Factory Installed: Address = 5) |

| Device _____ | | **Lower Media Drive** |
| **Address** _____ | | **Address** _____ (Factory Installed: Address = 6) |

| Device _____ | **Optional Fast/Wide SCSI Adapter** | **Upper Disk Drive** |
| **Address** _____ | | **Address** _____ (Factory Installed: Address = 1) |

| Device _____ | | **Lower Disk Drive** |
| **Address** _____ | [T] | **Address** _____ (Factory Installed: Address = 0) |

[T]

[T] = **Terminator**
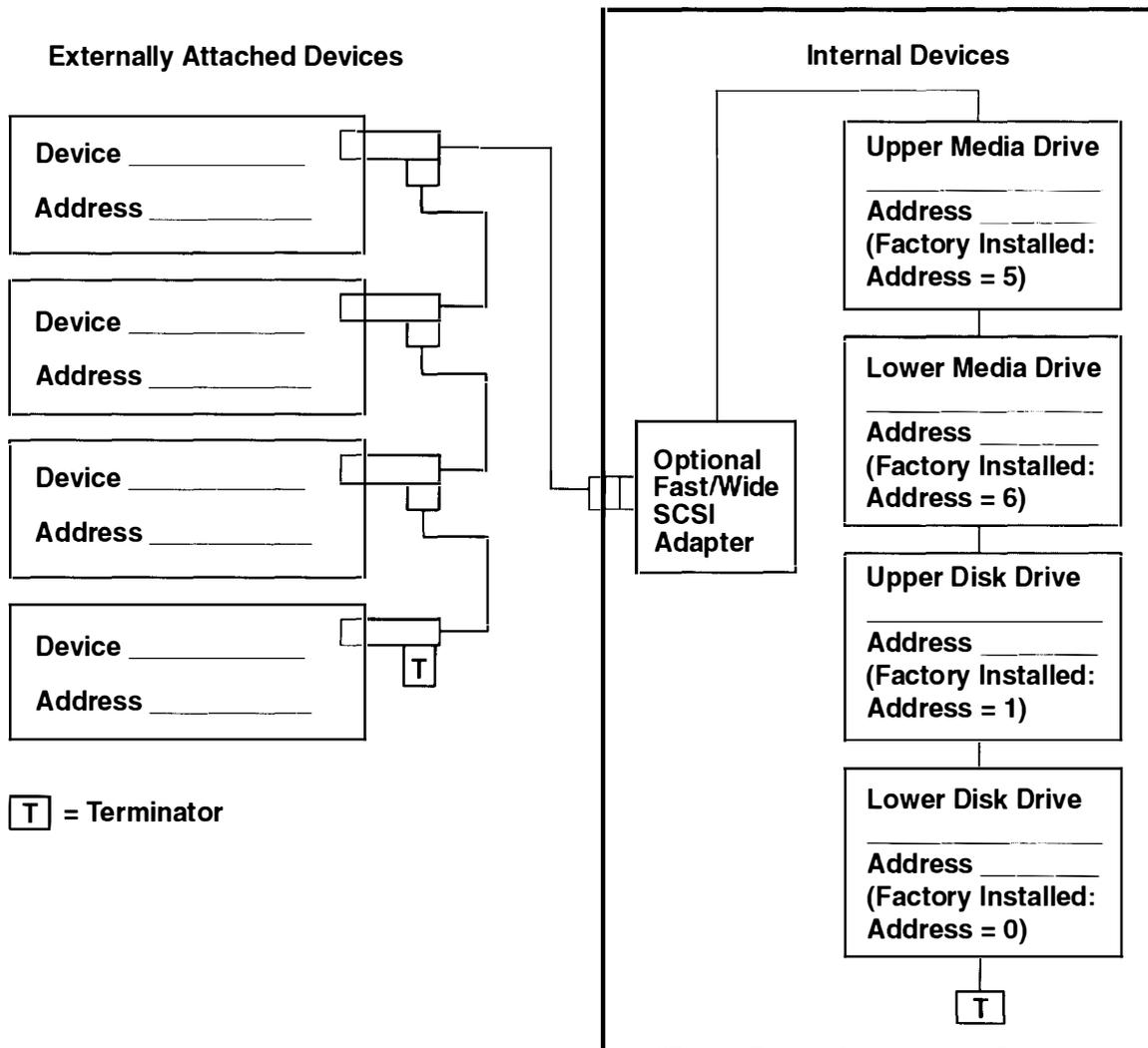
Appendix B. Three-Digit Display Numbers

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.

Note: Not all three-digit codes apply to this system unit.

Checkstop Codes

185	Processor-generated checkstop.
186	System logic-generated checkstop.
187	Graphics-generated checkstop.

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 4 for information about interpreting the displayed numbers.

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 an 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.
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 because of an IOCC bus timeout; x represents the IOCCC 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 Status Codes

This field contains the dump progress indicator value. See "Dump Progress Indicators" in this appendix.

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" in Chapter 4 for information about the diagnostic information contained within this message.

Operator Panel Display Numbers

This section contains lists of the various numbers and characters that may be displayed in the operator panel display. The numbers and characters are divided into two broad categories. The first group tracks power-on testing of the system unit; the second group provides information about messages that follow a *flashing* 888 number.

The operator panel display numbers listed below are valid only when the power-on indicator is lit.

To form an SRN from any *steady* number that occurs during system power-on test (BIST or POST), add 101- in front of the displayed number.

For more detailed explanations of operator panel display numbers, refer to the *Problem Solving Guide and Reference*, order number SC23-2606.

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.
185	A checkstop condition occurred during the BIST.
186	System logic-generated checkstop (Model 250 only).
187	Graphics-generated checkstop (Model 250).
195	BIST completed.
888	BIST did not start.

Power-On Self-Test (POST) Indicators

20c	L2 cache POST error. (The display shows a solid 20c for 5 seconds.)
21c	L2 cache is not detected. (The display shows a solid 21c for 2 seconds)
22c	Attempting a normal mode IPL from FDDI specified in NVRAM IPL device list.
23c	Attempting a normal mode IPL from FDDI specified in IPL ROM device list.
24c	Attempting a service mode IPL from FDDI specified in NVRAM IPL device list.
25c	Attempting a service mode IPL from FDDI specified in IPL ROM device list.
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.
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.
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.
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.
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.
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.
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.
271	Mouse and Mouse port POST.
272	Tablet Port POST.
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

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.
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	Unable to define NFS swap device during network boot.
555	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.
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.
77c	Progress indicator. A 1.0 GB 16-bit SCSI disk drive being identified or configured.
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.
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.
85c	Progress indicator. Token-Ring High-Performance LAN adapter is being identified or configured.
89c	Progress indicator. A multimedia SCSI CD-ROM is 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.
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.
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.
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.
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.
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.
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.
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.
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.

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.
c99	Diagnostics have completed. This code is only used when there is no console.

Crash Codes

The following crash codes are part of a Type 102 message.

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 (Dump Status Codes)

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.

Code	Description
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.

Appendix C. Replacing the Battery

Replacing the Battery

Note: For a translation of the safety notices, refer to the *System Unit Safety Information*, Order Number SA23-2652.

CAUTION:
A lithium battery can cause fire, explosion, or a severe burn. Do not recharge, disassemble, heat above 100°C (212°F), solder directly to the cell, incinerate, or expose cell contents to water. Keep away from children. Replace only with the part number specified for your system. Use of another battery may present a risk of fire or explosion.

The battery connector is polarized; do not attempt to reverse the polarity.

Dispose of the battery according to local regulations.

When replacing the battery, use Part Number 33F8354 or equivalent.

Removal

1. Remove the chassis and chassis cover as described in "Removing the Cover" on page 2-4.

Note: It is not necessry to remove the air-flow baffle in order to replace the battery.

2. Press down on the edge of the battery and push it away from the notch, then lift the battery out of the holder.
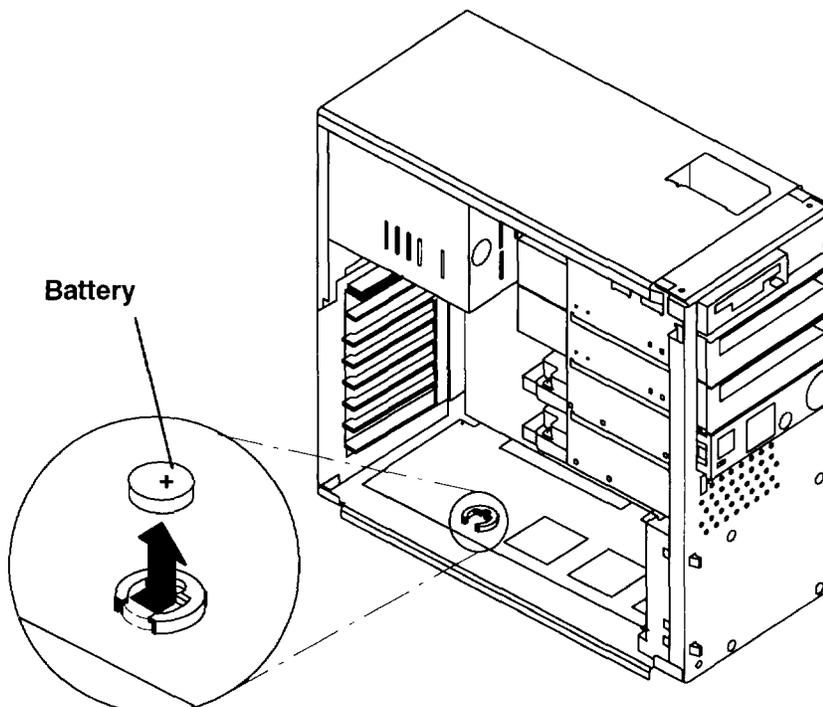
Battery

Replacement

1. Install the battery in the holder while being careful to observe correct polarity (positive side up).

2. Replace the chassis and chassis cover as described in "Replacing the Cover" on page 2-37.

3. Reset the time and date in your system.

Appendix D. Supplies

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

Part Number	Description
6404088	3.5-Inch 1.0MB Blank Diskettes (Box of 10)
6404083	3.5-Inch 2.0MB Blank Diskette (Box of 10)
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)
21F8593	8-mm Cleaning Tape Cartridge
0352465	1/2-Inch, Head Cleaning Kit
13F5647	Tape Cleaning Solution
33F8354	Lithium Battery

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
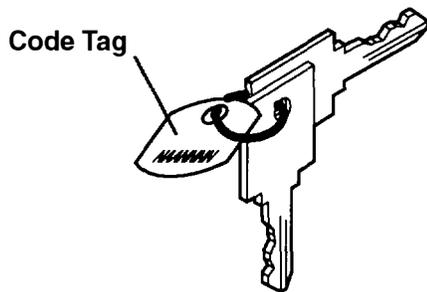
USA

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

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

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

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

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

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.

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Printed in the U.S.A.

11H8627

SA23-2715-01